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Perceptions of an EBP Module Mobile Application by New Graduate Nurses

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This is to certify that the doctoral study by

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Abstract

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MS, Walden University, 2013

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Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Evidence-based practice (EBP) is a key driver of care and advancements within nursing. It is essential to emphasize EBP early in a nurse's career to promote inquisitive minds and enthusiasm for seeking evidence. The purpose of this project was to implement an EBP mobile app into a nurse residency program (NRP) to improve the process of providing EBP information and resources to new graduate nurses. The intent of the project was to leverage mobile technology to engage new graduate nurses in evidence-based practice. Roger's diffusion of innovation framework guided the project. The target audience for the project was 16 new graduate RNs participating in a health system's NRP who attend the EBP module and were required to complete an EBP project. The EBP module was provided during a classroom lecture and the mobile application was downloaded. After using the EBP module, all attendees were sent an electronic survey with open-ended questions related to the mobile application. Responses were reviewed to identify patterns. Survey responses reflected that a 50% did not utilize the mobile application. However, those that did use the mobile application (50%) found it useful and had a positive perception of the mobile application. Continued use of the mobile application and promotion of the mobile application for new graduate nurses may help with their own personal development of an EBP project. Ultimately, allowing nurses to effectively integrate nursing research into practice and impact patient care quality. This project impacted social change by empowering new nurses with knowledge and information related to evidence based practice and allowed for increased information to be accessible to a large audience of new graduate nurses.

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Dedication

To Chris, Hayden, Harper, Mom, Dad and Michelle.

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This work would not have been able to be accomplished without the help of Dr. Jacque Carpenter, who has supported me during the entire adventure. In addition, Dr. Andrea Jennings-Sanders has provided the most guidance and professional support for this project.

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Section 1: Nature of the Project

Introduction

Mobile applications related to health are increasingly expanding, and the implementation of mobile technology within nursing support along with nursing practice is now recommended (Raman, 2015). It is estimated that over two million applications are available for download for an iPhone and over 700,000 applications are available on Google Play (Statista, 2016). Therefore, the use of mobile applications in evidence-based practice (EBP) implementation is logical. The purpose of this project was to explore the perception of the use resources provided via a mobile application for new graduate nurses.

Mobile applications are utilized everywhere within nursing. This includes at the bedside during care, within the clinics, triaging patients, and even charting documentation (Hurst, 2016). They are used in school for students to identify cardiac rhythms, look up medications, listen to pulmonary sounds, determine nursing process, and facilitate writing care plans. Their use continues into nurse's professional practice for disease diagnosis, calculators, drug references (Brusco, 2010; Mosa, Yoo, Sheets, 2012). Not only are mobile applications being used within healthcare, but they are also a common way to find information at home, directions to a restaurant, create a list to remember at the grocery store, communicate with people across the world and play games (Eggertson, 2012). Often targeted populations, such as Millennials', think to search for a mobile application to ease a process versus looking for information online or using a traditional computer (Brusco,

2010). The frequency of use in normal life results in the need to have similar type of resources within healthcare (Eggertson, 2012).

Smartphones can reach individuals across a large health system with information that is available during any shift. 90% of adults have cell phones, and 78% have smartphones (Pew Research, 2014). Per Long et al. (2015), technology allows for increased flexibility of use along with constant support. Clinicians are using their cell phone to look up information 70% of the time rather than using traditional methods (Long et al., 2015). In addition, students use their devices in class approximately 11 times per day, which fosters this behavior early within their learning career (Skiba, 2014). Information and the use of technology are needed to provide high quality care. New graduate registered nurses (RNs) are seeking information while transitioning to practice and desire to learn technical skills but also need resources regarding evidence-based practice (EBP).

New graduate RNs are expected to integrate evidence into practice early in their careers (Ferguson, & Day, 2007). The use of technology to facilitate this implementation will enhance the success of EBP by providing up to date resources. Currently, smartphones are being used on units with QR codes, drug information resources, and nursing procedure resources. Traditionally, the EBP process and resources have been explained in a classroom setting or on a computer; however, examining new methods to deliver EBP information is vital to new generations. Computers are considered slow, not mobile, and lack quick communication abilities (Brusco, 2010). Smartphones remove these barriers for information with fast, convenient, and mobile information (Eggerston, 2012). In this study,

I reviewed the implementation of a mobile application about EBP into a nurse residency program (NRP) to enhance the availability of EBP resources and knowledge about the EBP process of new graduate nurses.

Problem Statement

EBP is the integration of clinical expertise, patient values, and superior research evidence into the decision-making process for patient care (Rudman, Gustavsson, Ehrenberg, Bostrom, & Wallin, 2012). EBP is widely known to improve patient outcomes; however, it is challenging to implement (Breimaier, Halfens, & Lohrmann, 2011).

EBP is scientifically based and supported by nursing research. The integration of nursing research evidence into practice has been shown to improve patient outcomes, decrease cost, and improve the overall quality of care (Rudman et al., 2012). There can be as much as a 17 year delay between reported research findings and actual implementation of the evidence. (Ferguson, & Day, 2004). The implications of such a drastic delay can affect patient outcomes and overall quality of practice. Decreasing the time between nursing research findings and implementation is the responsibility of all nurses. Instilling the desire to find the evidence to answer clinical questions can occur in nursing school and continue as students' transition to their first positions as nurses (Rudman et al., 2012).

Supporting new graduate nurses with their own personal journeys in seeking, evaluating, and implementing current best evidence is vital to the advancement of the profession of nursing. New nurses are expecting not only different methods for learning, but also innovative ones (Phillips et al., 2006). Mobility and access are rapidly developing

within healthcare, and mobile applications can be a solution to provide information quickly and efficiently to bedside staff (The Advisory Board, 2014). The perception of new graduate nurses regarding EBP is important to impact early within their career to promote inquisitive minds and inspire continued searching for answers. Impacting the perceptions of new graduate nurses with the implementation a new format of information, such as a mobile application, which includes resources and support during EBP projects, potentially could improve EBP. This could result in a large impact upon the uptake of EBP into practice.

These concepts of slow integration of EBP and generations wanting information in quick, portable, methods result in the need to provide information and inspiration to new graduate nurses in an innovative manner. Mobile applications have been found to provide resources at the bedside, while also improving patient outcomes (Wyatt, & Krauskopf, 2012). However, despite learning about EBP in nursing school, many new graduates are still uncomfortable with the EBP process and unsure about where to start when developing an EBP project. Perhaps providing a mobile application that explains the steps in the EBP process, along with resources to assist with the development and implementation of EBP projects, will ensure that information is quickly accessible to new graduates. Furthermore, having the EBP mobile application accessible at the point of care may enable the nurse to consult the EBP resources when a new clinical question arises during their shift (Brusco, 2010).

As an example, medical-surgical nurses working at the bedside were curious regarding their patients not being able to consume anything by mouth after specific

surgeries and developing post-operative ileus. The new graduates wanted to start the process of determining new methods to prevent post-operative ileus but were unsure of the steps of EBP, how to review the literature, or the process to develop a PICO question. The problem statement for this project included the concept that new graduate nurses are unsure of the process of EBP, the resources of EBP, and they want accessible resources. A new method of delivery, a mobile application, which resulted in the modifications of their personal perceptions of EBP.

Purpose Statement

Technology is an effective way to provide materials and support to staff working at the bedside. Mobile devices can be used to access information and provide support while caring for a patient at the bedside (Friederichs, Marschall, & Weissenstein, 2014). Often nurses when asking a question outside of their professional atmosphere, utilize a mobile application. An example is directions to a location or current weather. Using mobile applications within a professional atmosphere can provide quick and rapid information. Normal range for laboratory values, heart sounds, or equipment instructions are found via mobile applications. Technology should enhance the therapeutic relationship between nurse and patient (Byrne, 2013).

Supporting the new graduate nurses with a mobile application that provided EBP related information and resources was the next step in encouraging new graduates to practice in an evidenced based way. Nurses should be educated on the ability to search best evidence and analyze, question, and select the best evidence for that specific practice question (Hee, Jung, & Kim, 2015). The purpose of this project was to if determine if the perception of new graduate nurses regarding EBP was modified by using a mobile application entitled “evidence-based practice,” and to determine their response to an innovative resource method. Most specifically, the question was what are the perceptions of new graduate nurses after implementing an evidence-based practice mobile application, which included resources and support for their first EBP project.

Nature of the doctoral project

In this project, I examined new graduate registered nurses' (RNs') perceptions toward a mobile application about EBP within a NRP. EBP is thought to be the most challenging aspect of understanding the first year of practice by new graduate nurses (Ferguson, & Day, 2007). Some of the key influences on the use of EBP were the individual's knowledge and attitude toward EBP (Munroe, Duffy, & Fisher, 2008). The nature of the project was to remove information barriers and influence new graduate's attitudes toward EBP to increase implementation of EBP. The use of the EBP mobile application allowed for support at the bedside while thinking of EBP projects (Ventola, 2014). Lastly, the EBP application created a sufficient resource with materials on EBP that nurses have requested to have web-based or mobile versions of material.

Within NRP, there was an EBP module, in which the new graduate or resident completed the initial stages of an EBP project. It was often reviewed as the most challenging and frightening module, and many nurses reflected that they would not want to continue the journey of their EBP project after they presented their recommendations during their EBP presentation. Nurses, encouraged by their mentors, to complete all the steps of EBP and not stop with recommendations but follow through with implementation. Nurses examined if the EBP changed their perception of EBP. The focus of this mobile application was to inspire continued involvement of nurses within their own practice and advancement of nursing.

Significance

EBP advancements were vital to the progression of healthcare, especially in nursing (Rudman, 2012). Determining the challenges of trying to understand and implement EBP was important to empower nurses from the beginning of their careers to engage within EBP. The mobile application, which described the EBP process, how to ask a question, how to review literature, the barriers of EBP, and methods to implement EBP served as a resource to RNs while working on projects. In addition, the mobile application was used at the bedside to transform questions into projects and follow steps on implementing findings from research.

Mobile applications allow for real-time information to be provided to nurses while working at the bedside and have been integrated into clinical practice during nursing school (Raman, 2015). Although not every student uses mobile applications at the bedside, 70% of students reflect using a mobile device to stay connected during class (Skiba, 2014). In comparison, 49% used their mobile device to complete course-related work (Skiba, 2014). The ability to engage with information while caring for a patient allowed the nurses to remain at the bedside and included information via a mobile technology. Literature found within this literature review, reflected the need to increase mobile compatibility to allow for portable methods of communication, information, and health access (Wyatt & Kraushkopf, 2012). The increased development of mobile applications to enhance nursing practice is the future of nursing care (Buller et al, 2013). Mobile applications continued to change the

environment of health care, and ones that are innovative, clear, informative, and concise have greater success within health care (Brusco, 2010).

EBP is a key driver of care and advancements within nursing and has been present since Florence Nightingale cared for patients during the Crimean war in 1850's (Phillips et al., 2006). EBP involves the use of the best clinical evidence to make clinical decisions (Phillips et al., 2006). Inspiring new nurses to want to complete EBP projects and further grow the nursing profession should be initiated early in a nurse's career. To accomplish this, nurses need the tools and resources to be able to incorporate EBP into their own careers (Phillips et a.., 2006). New graduate nurses often engage in residency programs upon hire and these programs support the nurse through the first year of practice (Ferguson, & Day, 2007). The transition to practice is challenging, and residency programs provide mentoring, guidance, and support in the first year (Phillips et al., 2006).

The capacity to provide care in an evidenced based approach is a core competency of all nurses (Rudman, Gustavsson, Ehrenberg, Bostrom, & Wallin, 2012). Every nurse has the responsibility to remain knowledgeable about their profession and practice in a professional manner, which seeks high-quality information to improve patient outcomes (Phillips et al., 2006). Most new nurses are concerned with technical skills and support is often provided via preceptors, leadership, and educators during this time. EBP support needs to be initiated during the first year of practice to instill an inquisitive mind and enthusiasm for evidence. Nursing research councils, if present within an organization, increase the promotion of a EBP (Phillips et al., 2006). The use of technology increases

productivity within health care (Brusco, 2010). The integration of a mobile application allows for instant answers to questions regarding EBP and informational resources to be delivered (Ventola, 2014).

Mobile applications are effective outside of healthcare (Moore, & Jayewardene, 2014). It is reasonable to consider the adoption of mobile technology into healthcare. Smartphone users are often those in younger generations. A recent study reflected that 58% of nurses utilized their Smartphone while at work for work related purposes (Moore, & Jayewardene, 2014). Per Mosa, Yoo, and Sheets (2012), the uses of mobile applications vary from disease diagnosis, drug references, medical calculators, to help with literature searches and clinical communication. In addition, 90% of adults have a cell phone (Pew Research, 2014). The use of smartphones is not just to remain connected but also to find answers to specific practice questions (Brusco, 2010). These percentages suggest that highly used mobile devices can become a mechanism for providing information and resources in real time. The use of an app, related to EBP resources, support the younger generation of nurses at the bedside in a meaningful manner.

Currently, nurses are one of the primary users at the bedside of mobile applications (Ventola, 2014). The effects on direct care are thought to provide improved access to information, improved decision making, and improved efficiency while working (Moore, & Jayewardene, 2014). Applications are being developed for everything from social networking, recipe exchanges, to shopping (Skiba, 2014). The move of applications into healthcare has met some resistance with developers and consumers worried with private

health information (PHI) being shared, and mobile devices interfering with care. However, recent literature reflects that mobile methods of communication need to be integrated into practice (The Advisory Board, 2014).

It is important to focus on specific groups within nursing to understand the complexity of the profession. New graduate RNs have specific challenges when learning the profession (Phillips et al., 2006). The new nurse often focuses upon the tasks for the patient versus the overall outcomes (Ferguson, & Day, 2007). In addition, new graduate nurses experience large amounts of stress in relation to understanding their role and responsibilities while caring for patients. Healthcare institutions ask new graduate nurses to engage in EBP from the beginning of their careers and at the 6-month mark often to fully participate in EBP within their units (Ferguson, & Day, 2007). Working environments are only becoming more challenging with sicker patients being at all levels of care (Buller et al., 2013). New graduate nurses are experiencing challenges with having lessened clinical experiences and potential shortcomings in nursing education, which have been shown to affect their practice of EBP (Rudman et al., 2012). Support is needed for the new graduate nurse to feel successful regarding EBP and have a positive, hopeful, and encouraging viewpoint of EBP (Phillips et al., 2006).

New methods of education are developed not only within the nursing school but also created to provide methods to educate staff once practicing as a clinician. A variety of applications have been developed to calculate drug dosing, prevent falls, support medical devices, and information related to specific diagnosis (Mosa, Yoo, & Sheets, 2012). Mobile

technology is incorporated into traditional classrooms along with post-academic clinical settings (Raman, 2015). Innovative methods that provided resources and education are being developed for nurses to improve their knowledge and skills (Hee, Jung, & Kim, 2015). Staying ahead of the innovative curve for new graduate nurses was important to the continuation of EBP incorporation (Phillips et al., 2006). Support for the new graduate nurses is no longer only a preceptor, manager, or educator, but also a mobile device that is carried in a pocket (Ventola, 2014). There are many organizations that focus on banning or limiting mobile devices, if appropriately used, mobile devices enhance patient outcomes and improved the support of nurses (The Advisory Board, 2014).

EBP and mobile application utilized to support the use of EBP is a strategic plan for the next generation of nurses. Nurses reflect that there is a lack of time to read literature, understand the ways to implement change, and even determine how to ask the right question (Rudman et al., 2012). The use of a mobile application to cover EBP process, ways to define a question, models to use to implement, and barriers allow for new graduate RNs to be supported in a manner that was found to be valuable (Rudman et al., 2012).

EBP is challenging. Often knowledge is limited regarding the best methods to find evidence (Ferguson, & Day, 2007). Nurses report a low level of support on how to access databases for EBP (Monroe, Duffy, & Fisher, 2008). Attitudes toward EBP are more challenging to discover. Nurses report positive attitudes toward research and evidence-based practice but often do not consistently implement findings into their practice. Most nurses reflect a lack of understanding of how to interpret research and make recommendations

toward practice (Monroe, Duffy, & Fisher, 2008). Each of these elements, previously mentioned, potentially influence the support of EBP. Per Monroe, Duffy, and Fisher (2008), the use of targeted interventions surrounding EBP made an impact on the overall knowledge and attitudes. Skills for implementation come later and do take practice, but if the initial categories are improved, then skills will follow suit (Ferguson, & Day, 2007).

Innovative interventions helped make a concept stick by allowing the learner to recall the information at a later time. Reaching the attention of the learner and having access to use the intervention later increased the overall success. There was a need for resources and education regarding EBP with the intent of increasing the readiness of every nurse to participate in EBP (Phillips et al., 2006). The most vital aspect of the adoption of EBP is that nurses need to be engaged early in their careers and know how to participate in the evidence-based practice to make a large impact at the bedside.

Implications for social change in practice

Mobile applications are frequently being used for various reasons. Healthcare organizations recommend adopting the methods of innovations from other industries and now use apps to gather information, access electronic medical records (EMRs) and gain knowledge (Aungst, Clauson, Misra, Lewis, & Husain, 2014). Healthcare organizations struggle with mobile device policies and how to handle the over 90% of health care workers, who use their own personal devices for work (The Advisory Board Company, 2014).

This project reflected the positive influence of mobile applications on practice and addressed the use of mobile applications in the work force. Mobile devices and applications enhance mobility and improve patient outcomes (The Advisory Board Company, 2014). Moreover, the mobile EBP applications implemented on the unit, to provide resources, to help the nurse identify clinical problems, ask the appropriate questions, and begin to develop a project to improve patient care process and outcomes (Brusco, 2010).

Definitions of Terms

The following are the operational terms for this project:

Application or "app": is a piece of software designed for the specific purpose for a user (Aungst et al., 2014).

Evidence-based Practice (EBP): is the combination of best current research, clinical expertise and patient values (Rudman et al., 2012).

Mobile device: is considered as the same as a Smartphone.

Mobile technology: is used as technology with a cellular capability (Brusco, 2010).

New graduate nurses: are individuals, who have less than one year of experience and were starting their first professional RN position (Ferguson, & Day, 2007).

New graduate nurse residents or "residents": are nurses with less than one year of experience that participate in a nurse residency program (Ferguson, & Day, 2007).

Nurse Residency Program (NRP): is a formal program that follows a new graduate for approximately the first 12 months of their career. This specific program consists of six required modules or lectures that the resident completes during a rolling enrollment. The culmination of the program is presenting an EBP project.

Smartphone: is also known as a cellular device capable of making phone calls but also downloading and running applications (Moore et al., 2012).

Assumptions and Limitations

There were assumptions within this project. The first was all new graduate residents, those attending the formalized NRP, had the ability to download the evidence-based practice mobile application from either the Apple store or the Google store. In addition, there was the assumption that the resident had a Smartphone or tablet to download the mobile application onto and utilized this device during their residency. The limitations for the project included that the sample population was one of convenience and levels of experience with EBP were not taken into consideration. All the nurses were new graduate RNs with less than 12 months of experience. While new graduates could have found the EBP application helpful other nurses with more experience in the process might not have

found it as helpful. In addition, those nurses who are not comfortable with mobile applications might have found it not as user-friendly. The findings of this project were believed to be generalizable regarding the use of mobile applications to provided resources for nurses.

Summary

Mobile technology is vital to examine and develop to engage the nurse at the bedside. Technology from a trustworthy downloadable source advises nurses to change their practice, continue to ask questions, or improve the quality of care. Using mobile applications to engage the nurse regarding EBP and improve younger generation of nurses to start EBP from their initial days to improve the overall knowledge, skills and attitudes regarding EBP. EBP is challenging and included barriers; however, removing some of these with the use of a mobile application is occurring.

Section 2: Background and Context

Theoretical Framework

I used Roger's diffusion of innovation model to develop this project (Appendix A and Appendix B). The model was developed in 1962 by Everett Rogers and categorized individuals into different groups as a classification of personal ability to adopt technology. In addition, the theory recognizes the ability to adopt new technology into practice (Rogers, 2010). There are five key stages of Roger's diffusion of innovation model. The individual proceeds through the five levels of knowledge, persuasion, decision, implementation, and confirmation (Appendix A). This occurs on a personal timeline as the individuals explores the device that is adopted. Each of these characteristics or stages influences an individual's likelihood to adopt or reject the technology (Rogers, 2010).

Within each of these stages, the individuals translated the concepts to the project by using a mobile application, which provided resources and support for the implementation of EBP into practice (Doyle, Garrett, & Currie, 2014). During the first stage of knowledge, the participants initially exposed to the innovation; however, they lacked information regarding the innovation. The initial launch of the mobile application fell into the category of a lack of information because participants were exposed to other mobile applications but not this specific application. The evidence-based practice mobile application published on the Apple Store and Google Play store before the EBP module within the residency program. Therefore, they were uncertainty of exactly how to use the application since the nurse residency participants had not utilized the application previously.

The next stage was persuasion; the participants were interested in the innovation and actively sought out information during this stage. This was after the initial launch of the mobile application, since facilitators encouraged participants to use the mobile application during the development of their own EBP project. During the EBP module, the facilitators highlighted, reviewed and encouraged to download the mobile application.

The decision stage occurs when an individual decides to reject or accept a change (Rogers, 2010). This was the most challenging aspect of Roger's theory, since the examiners often try to find if the innovative intervention (the mobile application) was being utilized. For project, the download usage of the mobile application was monitored via the Google and Apple stores. The facilitator of the EBP module monitored download numbers of the mobile application on a web-based platform.

The fourth stage is implementation, which is the stage at which researchers assess how the innovation was used and search for additional information of success. The implementation was examined with the survey questions. I surveyed the participants to see the effectiveness of this stage.

The final stage of Roger's theory is the confirmation stage, which determined if the participant would continue to use the innovation of the mobile application (Rogers, 2010). This aspect was developed with further projects and followed by the system education department. System education asked participant if they would continue to use the mobile application during the survey; however, monitoring of long term use will occur. Apple and Google Play stores monitored via comments left on the evidence-based practice

application download section. In addition, facilitators requested feedback of the residents, after they have completed the entire residency program regarding requested changes and improvements; however, these were outside of this specific project due to time constraints.

Each of these characteristics of Roger's diffusion model reflected how the new technology persuaded the group to adopt the technology (Appendix B). There are five areas that individuals fall into: innovators, early adopters, early majority, late majority, and laggards (Rogers, 2010). The use of this model applied to both the adoption of a mobile application and for the use of understanding EBP. It was predicted, by the facilitator, that some individuals would not adopt the use of the mobile application to help improve their knowledge, skills, and attitudes toward EBP; however, the focus was put upon the innovators, early adopters and the early majority to help improve the overall attitude toward EBP within the health system.

Definitions of the different concepts of adopters described below and reflected that due to a limited time between the new graduate residents downloading the application and developing EBP project, innovators, early adopters, and early majority individuals were all included within the responses of the survey. The late majority and laggards were assumed not willingly participate within the question and answer time. Within Roger's theory, Innovators were individuals, who were willing to take risks and adopt technologies that might even fail. Early adopters use their judicious choice to adopt a new idea and help maintain a central communication position of the new concept. Early majority vary slightly with the degree of time for implementation; however, they did adopt earlier than some. The

late majority was often skeptical about the adoption of a project and had little opinion leadership. The final section of the laggards are the last to adopt and often ignore their leadership's opinion, since they do not adopt any innovative ideas (Rogers, 2010).

Relevance to Nursing Practice

Specific Literature

The first search for specific literature conducted via CINAHL found 77 articles under the search terms of nursing and mobile application. An additional search within CINAHL, found 75 articles when the terms of nursing and smartphone were utilized. Additional search engines of PubMed, EBSCO, and OVID conducted found the resulting numbers of 332, 158, and 32, respectively. I retrieved a total number of 599 articles. I reviewed each for relevance regarding using a mobile application on the floor while working. The following articles were key literature for the use of mobile applications and smartphone at the bedside. This was determined by relevance to clinicians especially nurses, discussing EBP, and using mobile applications on a smartphone. Exclusion, of the many articles, included disease specific resources, patient-focused, not evidence-based applications, not used on a smartphone, and not in English. The strongest eight articles are included in this section.

Hee, Jung, and Kim (2015), focused on the development, adoption, and implementation of a smartphone application about EBP and if it would improve the utilization and diffusion of EBP guidelines. This level III evidence on a scale of Melnyk's scale of evidence was a well-designed trial without randomization (Melnyk & Fineout-

Overholt, 2005). Evaluating the level of evidence was vital for this project to determine significance. This 6-month study included 60 nurses and had a twofold purpose to create an EBP application along with evaluate satisfaction. The method of the study was a quiz to monitor improvement of knowledge along with tools to evaluate the user's satisfaction (Hee, Jung, Kim, 2015). Data analysis was conducted via a descriptive analysis and monitor how often the participants interacted with the application. The findings of the study reflected that the mobile application is an effective educational tool. In addition, enjoyment from the participants was favorable for continued use of mobile applications. Implications reflected that further use of mobile applications to support the use of EBP guidelines and process; however, the application should be integrated with hospital specific information (Hee, Jung, & Kim, 2015).

Petrucka, Bassendowski, Roberts, and Hernandez (2013) conducted a study with 254 nurses and 23 nursing students regarding nurses' usage of mobile devices and mobile information via handheld devices. This qualitative and quantitative method study captured data over a 4-year period and resulted in five key themes. It was considered a level III on Melnyk scale (Melnyk, & Fineout-Overholt, 2005). The study wanted to build mobile health awareness and availability, put information into a mobile device that was contextual to their focus, imbedded an app with evidence, provided the information for different levels of understanding, and allowed for changes to implement over time (Petrucka, et al. 2013). The data analysis looked at each tool and key findings to evaluate for each of the five key lessons. Overall, the recommendations, from the study, were to continue to use mobile

devices for delivery of information to improve care, quality, and knowledge regarding multiple topics. Lastly, the point of mobile applications included being a viable method of delivery of information as a resource and researchers mentioned the ease of downloading ability and fast access (Petrucka, et al., 2013).

An effective systematic review by Mosa, Yoo and Sheets (2012), related to health care applications for smartphones encompassed 55 articles and discussed 83 applications. The purpose of the review was to classify smartphone-based healthcare technologies based on their functionality and category (Mosa, Yoo, & Sheets, 2012). This high level of evidence of a level 1, was considered the highest level of evidence (Melnyk, & Fineout-Overholt, 2005). Methods for this systematic review followed the PRISMA statement for systematic reviews and included terms such as smartphones, PDA, and handheld computer. This concluded 2894 articles, which were reviewed for content and relevance and were narrowed to 55 articles. These articles primarily highlighted smartphone applications (Mosa, Yoo, & Sheets, 2012). The analysis conducted included articles into main categories for applications such as disease diagnosis, drug reference, medical calculator, literature search, communication, training, and general healthcare applications. Across these articles, in the systematic review, researchers found that these clinical applications and evidence-based resources were being used at the point of care and the mobility helped health professional use them (Mosa, Yoo, & Sheets, 2012). The implications of the systematic review were the continued development and utilization of evidence-based mobile applications with pertinent content.

Buller et al. (2014) examined the use of a mobile application, and how the use of Smartphones constantly changes and influences methods of communication. Buller et al (2014) designed qualitative study of 16 individuals and conducted a focus group of participants, who had downloaded the mobile application regarding real time advice how of the individual's perception of the application. This study was considered a level VI on Melnyk's levels of evidence (Melnyk, & Fineout-Overholt, 2005). Researchers conducted analysis in the terms of a thematic summary and found that participants would continue to use a mobile device and the application made them more diligent about the use of mobile apps (Buller et al., 2014). This resulted in a large data collection via the focus groups. Data analysis reflected 269 codable comments and input into various categories. Researchers followed up by implementing a usability survey to test the prototype application. Findings from the follow up also implicated continued use of mobile applications with any information regarding health care. Findings from the study showed that mobile applications should be used in a variety of ways and can help provide interventions to end users.

Another research study examined the effectiveness of technology based intervention to teach EBP. This study by Long et al. (2016) included the purpose of guiding participants through the basic steps needed to locate and critically appraise literature while linking to EBP. This mixed method study utilized a testing tool as the method of research along with randomizing each group that would the tool or not, which allowed for the study to be considered a Level II on Melnyk's levels of evidence (Melnyk, & Fineout-Overholt, 2005). Participants took pre- and posttests. Then researchers analyzed via a mixed model method

the data and reflected that a statistically significant difference between pre- and posttest scores regarding improvement in overall research skills. Additionally, ability to distinguish credibility of online sources, along with research was noted with the use of the technology. The findings supported the continued use of technology, such as a mobile device, to support research and EBP (Long et al., 2016). The implications of this study were that continued innovative methods to teach or provide resources is valuable and effective in improving research skills along with appraising the evidence (Long et al., 2016).

One key research study published in 2015, by Raman provided support for the use of mobile applications for teaching nursing. The meta-analysis found 188 articles were included in the review by using key terms of nurses, personal digital assistants, mobile technology, and handheld devices during a search in CINAHL, Medline, and Academic Search Complete. The purpose of the study was to explore the literature regarding mobile applications along with strategies to enhance the use of mobile applications within nursing (Raman, 2015). The literature review was a systematic review of descriptive and qualitative studies and was considered a Level V in Melnyk's study (Melnyk, & Fineout-Overholt, 2005). The literature revealed that use of mobile technology for nursing students and nurses new to practice was highly beneficial for the nurse to understand new concepts. In addition, new mobile applications needed to be created to deliver information via a method that nurses find very valuable (Raman, 2015). This study examined not only Smartphones but also tablet devices to provide resources during clinical time and curriculum, but nurse educators needed to strive to meet the recommendations of International Council of Nurses

to provide information by use of mobile applications (Raman, 2015). Implications found that even though much has been done to incorporate mobile technology into nursing, there needed to be continued integration and developed strategies to overcome barriers.

The use of Smartphones in clinical practice was researched by two individuals, Moore and Jayewardene (2014), by use of a survey in England and focused on the ease of use, acceptability, and safety of mobile applications while at work. The study of 161 participants found that using a mobile device improved access to information, improved decision making, and improved efficiency (Moore, & Jayewardene, 2014). The methods of data capture were a survey, which allowed for data analysis to be input into a system to capture mean data on the Likert scale responses. This was a well-designed and considered a level VI in Melnyk's evidence (Melnyk, & Fineout-Overholt, 2005). The study inferred that mobile applications were here to stay and there were potential benefits with using information in this manner and to continue to provide information to be used via this method. This resulted in the implications that mobile applications needed to be continued to use for nurses to have information at the bedside.

A recent publication by the Advisory Board Company (2014), regarding mobile device usage in health promoted the use of applications and mobile devices, but policies needed to be created surrounding the use of mobile applications within an organization. In addition, the use of mobile applications was created by third party vendors or organizational developed mobile applications. Although it was a level VII in Melnyk's levels of evidence, it remained to have clear points and valuable information (Melnyk, & Fineout-Overholt,

2005). Lastly, the advisory board stated that actionable items were to ensure that everyone has been trained on the proper uses of the mobile application within an organization. This was not specific literature but rather a synopsis of key resources regarding the need for mobile policies and ways to develop mobile usage within an organization. It did not contain a method or a data analysis but provided recommendations on how organizations implemented policies to ensure safety for everyone involved.

General Literature

As mentioned previously, CINAHL, Pubmed, OVID, and EBSCO were utilized to search for literature regarding mobile applications and the use of delivering information. Within these search engines articles referring to Smartphones found 2962, 9870, 188, 158, articles respectively. This totaled over 13,000 articles regarding the use to mobile applications. Key words for this search were smartphone, cell phone, and mobile phone. Multiple duplications were taken out across the multiple search engines and an additional literature search of general information regarding EBP and mobile applications was conducted and found 92 references to mobile applications and EBP within the four different search engines. Many of these articles were included because of their ability to translate the findings to use mobile applications for a variety of informational methods. Articles were included that focused upon health care mobile applications for nursing staff and applications that could be used at the bedside. In addition, many articles were removed due to smartphones being used as forms of connecting for treatment or communication and not for

an application base. Exclusions included non-healthcare articles, patient-focused mobile applications, articles focusing upon distraction by smartphones, and nonacademic journals.

Mobile applications were being used within health care (Brusco, 2010). A key summary regarding the use of smartphones applications for all different parts of healthcare was conducted by Jennifer Brusco. This study examined the ability of an individual to manage their own multitude of activities with the use of mobile applications (Brusco, 2010). This study was considered a level VI in Melnyk's level of evidence. This summary included multiple applications from various companies and evaluation of each of the different type of applications available on the market. The summary also included one study of a healthcare institution that surveyed staff members to determine if the use of text, apps, and alarms improved patient safety and communication (Brusco, 2010). This study found that staff responded positively to the use of mobile devices to communicate and provide information, which also resulted in the decrease of overall paging and alarm noise (Brusco, 2010).

Another study by Wyatt and Krauskopf (2012), was an earlier examination of the use of smartphones to enhance nursing practice. This meta-synthesis encompassed 50 research articles regarding the use of smartphones and purpose was to determine how nurses have been adopting smartphones into practice. The findings reflected that many nurses were utilizing smartphones in practice, and perceive that using smartphones can be useful. This systematic review of qualitative studies was considered a Level V in Melnyk's levels of evidence (Melnyk, & Fineout-Overholt, 2005). Lastly, the findings of the various studies reflect that adoption improved when resources and support from management were present

(Wyatt, & Krauskopf, 2012). The overall implications reflected that continued use of smartphones in healthcare and developing reliable applications that can facilitate the care of patients and improve safety (Wyatt, & Krauskopf, 2012).

A pilot study examined the use of mobile devices at the bedside utilized a sample of 19 2nd and 3rd years' undergraduate students in the United Kingdom. The study had the purpose of testing the feasibility of using mobile devices to access evidence-based resources (Morris, & Maynard, 2010). This well-designed study was considered a level II in Melnyk's levels of evidence (Melnyk, & Fineout-Overholt, 2005). A pretest/posttest designed questionnaire was utilized for the project and sent out to the convenience sample of students. The findings reflected that there was a low level of utilization of the mobile devices in the clinical setting due to difficulty finding personal computers that had an internet connection and could access the EBP resources (Morris, & Maynard, 2010). The limitation of access was a large barrier for the study, and the participants were using mobile computers versus a mobile phone. The nursing implications for this study look to find easy to access methods for information for nurses to use in a rapid manner; however, the findings report that the access must not be limited and if it does become limited, then nurses would find other manners to find the information (Morris, & Maynard, 2010).

Additionally, using innovative approaches to teach EBP was focused within literature. Philips et al. (2006), reflected that creative approaches needed to be utilized to teach EBP and mentor nurses to understand, evaluate and create links between research and EBP. Finding those innovative methods was challenging. The study utilized mock trials as a

method to increase awareness and interest for nurses to integrate research into practice. The sample included staff nurses working at the University of Chicago hospitals and evaluations of the trials were used to capture data. The findings reflected that the mock trials were a useful method to introduce the concepts of EBP to staff (Philips et al., 2006). Implications for practice included continual challenge of the delivery methods of information to staff and using methods to explore opportunities to integrate research into practice (Philips et al., 2006).

An article focused on the implementation of mobile applications to enhance the ability for nurses at the bedside to multitask and managed nursing interventions reflected that five key components were necessary when using smartphones or mobile computers (Ehrler, Wipfli, Teodoro, Sarrey, Walesa, & Lovis, 2013). The study reflected the use of five users in a focus group method and open-ended questions, which had the purpose of determining if mobile applications would be beneficial to helping obtain data and determine necessary interventions while caring for patients. The study was considered a level IV in Melnyk's level of evidence and does provide valuable information (Melnyk, & Fineout-Overholt, 2005). This data analysis examined the development process of a prototype along with testing in a test environment. Findings reflected that five key themes were present when developing mobile applications to be used at the bedside: financial implications, hardware development, communication aspects, security of data, and a user interface. Lastly, the implications for practice found that mobile applications should be developed but

careful considerations should be used so they are not distractions and data is not breached (Ehrler et al., 2013).

Additionally, a study conducted by Nason, Burke, Aslam, Kelly, Akram, Giri, and Flood (2015) examined the use of mobile applications as a reference tool for urology trainees focused on 38 participants. The purpose of the study was to examine, if a mobile application allowed for instant resources to be used quickly and at the bedside instead of going to a computer. The participants completed a survey regarding smartphone usage and the use of mobile applications. The study was considered a level IV in Melnyk's levels of evidence (Melnyk, & Fineout-Overholt, 2005). The analysis of the survey that 100% of the participants have a smartphone, and 77% use mobile applications to get resources and information while working. The findings reflected that with the increased amount of applications available for healthcare employees, healthcare employees were wanting to use those as resources and information. The implications were that smartphone were a useful tool for education and references and should be continued to be developed and used as an aide in clinical practice (Nason et al., 2015).

A study conducted by Schmucker, Heid, and Haag (2014) focused on the replacement of paper guidelines with a mobile application reference for pediatric emergencies. The purpose of this study was to if having the resource in the clinician's pocket would it improve resources to be used in quick manner. The application was developed by the participants for use within a hospital setting. The study has important concepts explained and was considered a level VI in Melnyk's levels of evidence (Melnyk,

& Fineout-Overholt, 2005). The findings reflected that an easy to use mobile application was developed and could be applied to emergent cases. The implications that continued development of mobile applications is warranted, but the question of how to remain up to date would be considered and need to be evaluated in future research (Schmucker, Heid, and Haag, 2014).

Lastly, Ferguson and Day (2007), examined the issues confronting new graduate nurses as they enter practice. This meta-synthesize encompassed the struggles of a new graduate found within research during the last ten years. The sample contained 27 articles that found that new nurses need support in translating EBP into their practice (Ferguson and Day, 2007). Although slightly dated, this strong Level V in Melnyk's levels of evidence allowed for a great summary (Melnyk, & Fineout-Overholt, 2005). Additionally, findings concluded that if support was provided to new graduate nurses regarding the care they provide, and EBP that potential benefits such as recruitment and retention would occur within that organization, as well (Ferguson, & Day, 2007). Therefore, key implications resulted in the need for additional methods to support new graduates during the transition to practice regarding not only skills to care for patients but also how to implement EBP into practice (Ferguson, & Day, 2007).

Local Background and Context

Mobile applications could contain a vast amount of information. It was imperative that this information was correct and evidence-based itself. The evidence-based practice mobile application was a new application that had content related to the key elements of

EBP. Per Steurer (2010), models to guide EBP should have included within the teaching and resources. evidence-based practice mobile application contained two models that did guide EBP. The first was the IOWA model and the second was the ACE Star model. Additional elements that surround supporting EBP were identification of clinical questions and how to write a clinical question in PICO format, which included population (P), intervention (I), comparison (C), and outcomes (O) (Steurer, 2010). Additionally, how to appraise the evidence, what were the steps of EBP and the expectations of EBP within an organization were key elements to support the new graduate or any employee while conducting EBP projects (Friesen, Brady, Milligan, & Chistensen, 2017). Therefore, the need for a large healthcare organization to encourage employees new to EBP to use innovative resources such as a mobile application allowed for support at the bedside.

Role of the DNP Student

The role of the DNP student for this project was to create a mobile application regarding EBP and provided this innovative method of information to new graduate registered nurses within a residency program. The mobile application was used to provide similar style resources to paper resources only in an electronic method. Additionally, this DNP student highlighted the mobile application during an evidence-based lecture series and helped facilitate the downloading of the evidence-based practice application by new graduates, if they desired to use this format. Lastly, the DNP student facilitated the arranging of the distribution of the survey and the collection of the survey; however, it was

not possible to identify the individual responses of the survey. These findings then were presented back to key stakeholders within the residency program.

The evidence-based practice mobile application became available in the Google Play Store and Apple Store in August 2016. Screenshots of the mobile application were available (Appendix D). The Director of Nursing Research along with this DNP student spent a day brainstorming multiple questions to ask, along with utilizing questions from current literature to develop the open-ended questions survey within this project. The instrument consisted of open-ended questions. Questions asked allow for participants to reflect their own perspective (Appendix C). Feedback from previous resident groups was read and evaluated to determine areas of support. These comments taken from evaluations were then summarized and incorporated into the evidence-based practice mobile application.

Summary

Evidence-based practice was widely known as the standard of care. It was supported throughout the literature as the standard of practice for nurses. As technology increases, the methods provided support and resources for change. The use of mobile technology and handheld computers assisted the questions asked at the bedside in continued development and inspired those creating the questions to have support in real time. The use of mobile technology was valued within current generations and continued to be increasingly utilized by healthcare organizations for support of employees but also for support of patients.

Section 3: Collection and Analysis of Evidence

Project Design/Method

I designed a qualitative EBP project. The method of this project was an open-ended question survey feedback. The design was the most applicable to provide information for the author of the evidence-based practice mobile application regarding the use at the bedside and methods to improve the mobile application over time. Additional studies completed in the past have included the use of mobile application over time (Crixell, Silva, Markides, & Smith, 2016; Kenny, Dooley, & Fitzgerald, 2016). The support of EBP at the bedside for new graduates was thought to help facilitate the early adoption of EBP early in their career (Ferguson, & Day, 2007).

Practice-focused question

The practice-focused question for this project was: What are the perceptions of new graduate nurses after implementing the evidence-based practice mobile application, which included resources and support for their first EBP project? This question was evaluated after the implementation of the mobile application with a survey. Questions were directed to a NRP group regarding the mobile application and resources surrounding EBP for the new graduate RN. The survey was supported as a collaborative effort by the director of nursing research, director of system education, and educators in the organization.

Sources of Evidence

Population and Sampling

This project was designed as a qualitative project, which looked at the responses in an open-ended question within an electronic survey. The population for the project were new graduate RNs within a large health system that included 10 hospitals. All new graduate RNs participated within one centralized and formalized NRP and were required to complete an EBP project. Each nurse resident had less than 12 months of experience and was participating in the residency program. The program has a rolling enrollment and experience levels to range from 1 month to 12 months. This variance of experience could have affected the rate at which residents downloaded the mobile application. A nurse resident could have one to 11 months of experience during this project. Nurses with 12 months of experience and completing their final project were potentially more likely to download the application for immediate use.

The program was divided into two different cohorts. Only one of the cohorts could participate due to the timing and their exposure to the EBP application, which was the Monday 2017 group. The cohort, which attended the NRP module about EBP on Mondays in 2017, was less experienced than the other cohort and was estimated to graduate in January. The Tuesday 2017 cohort was a slightly more experienced group of new graduate nurses, who would graduate the program in June. The cohort graduating in June was surveyed. The nurse residents were from both rural and urban hospitals in the Midwest region of the United States and represented all different practice areas. The health system did a system approach of an NRP program and included 10 different hospitals within the

program at one time. Each of the hospitals sent their new graduate residents to the programs every other month. The groups met in person for each of the modules that exist within the program.

There are approximately 150 residents in the program at any given time. The group that graduated in June was the targeted focus of this survey. The group was presented with an email and link to the electronic format of the survey via Survey Monkey, which is a web-based survey builder and platform. The results were kept confidential and unidentifiable. Those willing to complete the survey were considered consented when they volunteered to take the survey. The sampling of these participants was on a volunteer basis and not a random sample of residents. The sampling consisted of one of the cohorts of the NRP. The participants were not compensated for their time to prevent persuasion to participate.

The residents were exposed to the mobile application during one of the NRP, which focused on the concepts of EBP. During this program, the application was highlighted, and each section reviewed. There was no cost to download the evidence-based practice mobile application. There could have been potentially be data charges, if the individual's personal device was set for charges. Additionally, the mobile application could have been downloaded to a tablet; however, the intent for this project was the use of a mobile phone. The application covered the content for completing an EBP, writing a PICO question, evaluating evidence, and the expectations of EBP. Each participant was encouraged to use the mobile application during their exploration and development of their personal EBP project whether they participate in the survey or not.

The director of nursing research and I created the questions used within the survey were open-ended questions. Questions were determined after examining other EBP in the literature surrounding mobile application. Within the evidence, common questions were recognized and included in the survey (Biediger-Friedman, Crixell, Silva, Markides, & Smith, 2016; Kenny, Dooley, & Fitzgerald, 2016).

Initially, 20 questions were developed and narrowed down to six questions. The questions were then reviewed two weeks later to confirm that they were still applicable for the use of this project. The review of the questions was compared with the evaluations from previous residency cohorts to determine, if the content was to the evaluation questions. The questions were initially pulled from two different projects surrounding mobile applications and the effectiveness of this method of resources or support. The 6 questions were finalized and included in Appendix C.

Data Collection

Data collection was conducted in an electronic open-ended question survey. Approval via the institutional review board (IRB) for both the health care organization and Walden University was completed for the questions used in the survey along with the project overall. Within the health care organization, the IRB and human resources department reviewed the intent of the project, questions to be asked of employees, and the overall proposal for the evidence-based practice project. I received the approval number of 06-21-17-0341534 for this project.

The questions in the electronic survey addressed concepts such as experience of use, along with positive or negative aspects of the application, experiences using an evidence-based practice mobile application to create their own project, and methods to obtain new information. The survey disseminated near the end of the residency program, which also coincided with the completion of the nurses' EBP projects.

This was after a lecture module with small group work time regarding EBP. This lecture covered elements of EBP, and the mobile application explained during this lecture. The survey took approximately 10 to 15 minutes to complete. All individual responses were kept confidential by not identifying the individual responses and identifiers were not used during data analysis. The individual responses were provided in English and there was no need to translate the responses.

Analysis and Synthesis

Data analysis upon the electronic survey was then conducted via the NVivo qualitative data analysis tool. This allowed for an unstructured data set to be analyzed for content themes for the question responses, which was supported in other analysis of mobile application. Open-ended questions can potentially generate a large amount of responses; using electronic software such as NVivo was helpful in providing insight to the unstructured data that resulted from the open-ended questions. This allowed for inferences by myself to occur related to the responses. The initial survey allowed for retrieval of responses to be easily gathered by nurse residents and was sent out via a weblink. The response rate and initial data were reviewed via survey monkey. The responses were exported to an electronic

format and uploaded to NVivo. I uncovered data to explain unknown connections between mobile devices and the new graduate's perception of EBP.

Project Evaluation Plan

The evaluation plan was to sort the obtained data into different themes identified within the responses. The data trends were reviewed to determine, if the mobile application was utilized and provided increased resources for the new graduate to develop their first EBP project. Additionally, it was examined to see if the mobile application changed the new graduate's perception of EBP. The results were brought back to the health system's education department to reflect upon the use of technology at the bedside and implementing the use of the application for all EBP projects within the large health system.

The use of technology was examined by the manager and director of the education department to determine if additional funds could be budgeted to increase the use of mobile applications at the bedside. In addition, results were brought to the steering committee of new mobile devices being implemented for RN communication and provide evidence toward adding additional resources on a mobile device. Lastly, I presented the project to the nursing research council and evidence-based practice council to help inspire others to partake in technology development and use.

Summary

The project design included an electronic survey with open-ended questions for new graduate nurse residents who have been exposed to an EBP mobile application as a resource to enhance their resources while developing their first EBP project. The survey included

questions about the innovative technology and ability to improve the ease of information developed during an EBP project. After data analysis via a content analysis, I evaluated the results to make determinations and changes toward the support and resources provided to new graduate RNs working on their first EBP project. The overall goal of the project was to determine if mobile applications are an innovative, creative, and appropriate method to provide information to new graduates and if they affect new graduates' attitudes toward EBP.

Section 4: Findings and Recommendations

Introduction

The results of this project allowed for future implications of the use of mobile applications with an organization. All nurse residents that had been exposed to the EBP mobile application during the lecture related to EBP received the open-ended survey. The survey was sent in June 2017 to 129 potential respondents. The survey link was sent electronically and was open for 3 weeks. Three email invitations were sent to the selected group who had recently completed their final project of the NRP. Each of these email invitations was sent 1 week apart. The overall the information found from the data, was collected via these open-ended questions survey versus other mechanisms.

Findings and Implications

There were 16 respondents. Four of the email invitations were sent back as undeliverable and never reached their intended participant. These 16 responses were received over 3 weeks. The group consisted of all new graduate registered nurses who had completed their first year of practice and developed their own EBP project. The group surveyed included registered nurses with 12 to 14 months of experience. The nurse residents participated in a yearlong residency program and had just presented their final project. Each of the respondents was from a large health system and worked within a variety of hospitals. The hospitals were rural and urban hospitals in the Midwest of the United States. The responses included the overall purpose of this project, which was to determine if a mobile application affects the perception of EBP and project by new and

trends for the project. Therefore, this project impacted the overall interpretation of the perception of new graduates.

The first questions in the survey examined nurses' experience with the mobile application. The 16 responses reflected that eight of the respondents did not use the mobile application at all during the development of their EBP project. These responses were important to examine throughout the rest of the analysis to determine the barriers to utilizing the mobile application. The other eight responses reflected a theme of using it mostly during the lecture and small group discussions of the NRP. Another theme was that respondents also used the application while developing their personal EBP project (see Figure 1).

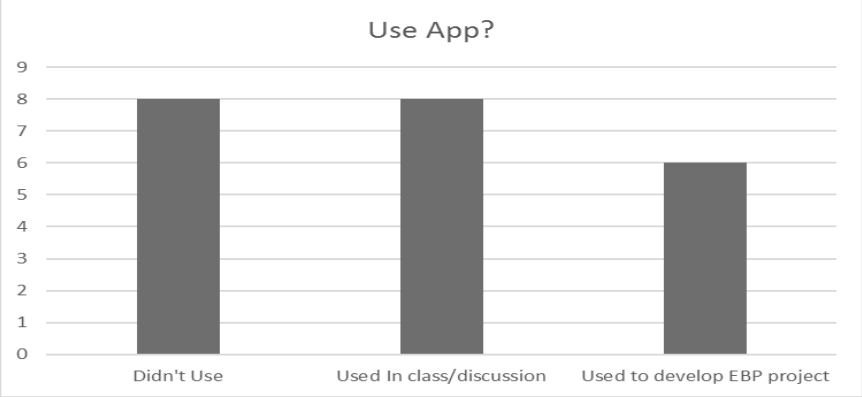

Figure 1. This graph reflects the first question themes with eight respondents not using the application. The other respondents used the application in class along with the development of the project.

The second question within the survey examined the elements that the nurses used to develop their own EBP project. Of the 16 responses, eight reflected that they did not use the mobile application at all. The other eight participants stated that they utilized the steps

of the EBP process along with how to evaluate evidence. The themes of providing the steps along with evidence were important areas to continue to focus on for the new graduate nurses to support their own experiences with EBP projects (see figure 2).

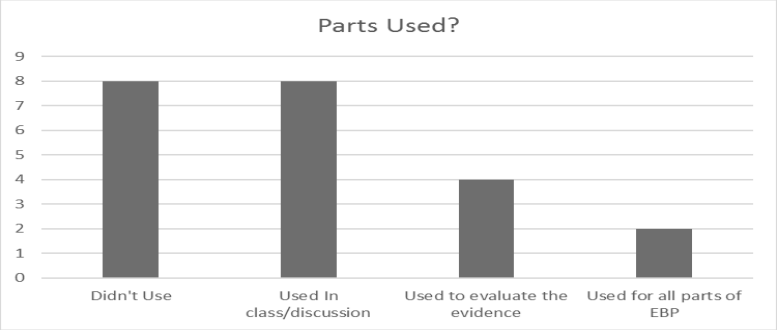

Figure 2. This graph reflects the second question themes with 8 eight respondents not using the application. The other respondents used the application in class to evaluate evidence and for the development of EBP.

The third question of the survey examined the most helpful aspects of the mobile application. Eight of the respondents stated that they did not use the mobile application and, therefore, did not find any parts helpful. However, the other responses reflected multiple themes of easy access to information and all the resources being available any time (see Figure 3).

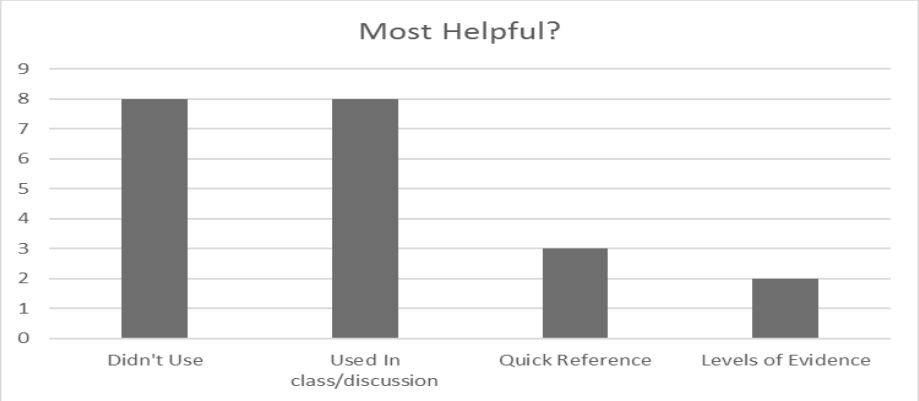

Figure 3. This graph reflects the third question themes with eight respondents not using the application. The other respondents found the application most helpful as a quick reference and to know the levels of evidence.

The fourth question of the survey addressed where the respondents typically get their own information. It was answered by all the respondents. Even those that had not used the mobile application stated where they typically gather information. Fifty percent of the respondents stated that they use online resources or the internet to get information. Additionally, the responses reflected that new graduates looked to reputable journals, evidence based resources within the organization, and their peers for information. The theme of both evidence based methods of information along with nonguaranteed evidence-based information such as the Internet was an important difference to highlight for this project. There was no confirmation that the respondents, when reflecting utilized nonevidence-based resources on the Internet but it was also not identified that they are using evidence-based resources. This became an important difference to examine further (see Figure 4).

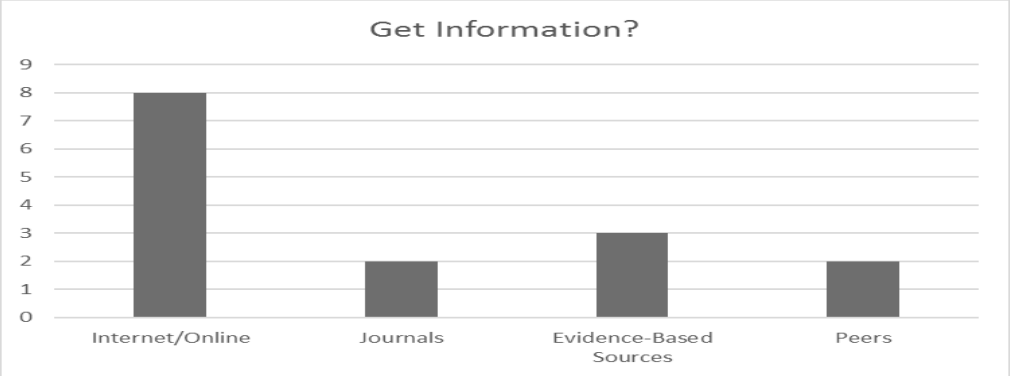

Figure 4. This graph reflects the fourth question themes with 16 respondents reflecting that they use the internet, journals, evidence-based sources, and peers as sources of evidence.

The fifth question of the survey examined the feelings from the respondents of the application to support their own EBP project. This question provided interesting themes of many of the respondents not finding it necessary to utilize the application and that they would be able to complete the project without this resource. The other responses also reflected that the new graduate positive feelings toward the mobile application. There was a theme that the mobile application could have been promoted more to enhance its impact on the project. This was an interesting theme because of the method that the mobile application was introduced to the new graduates and it could be changed for the future. The potential use of different marketing could be explored. This question was very split by responses reflecting two different decision. One reflected the feeling that it was not necessary and the other reflected positive perception of the support that the mobile application could provide (see Figure 5).

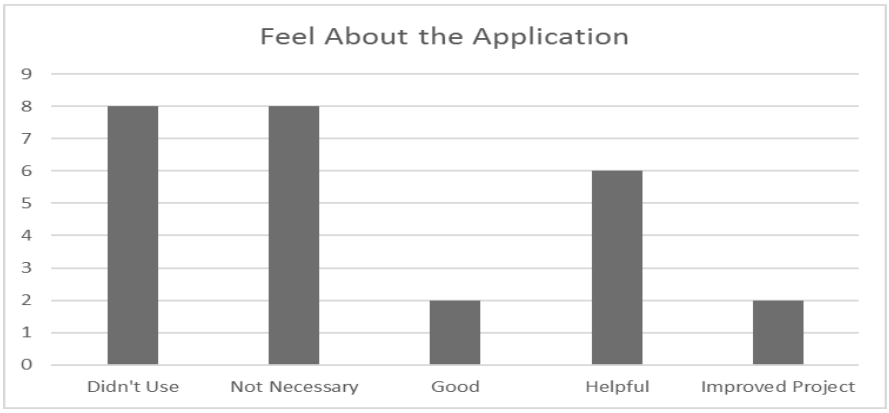

Figure 5. This graph reflects the fifth question themes with eight respondents not using the application and not necessary to use. The rest of the respondents reflected that their personal feelings were good, it was helpful and it improved the project.

The final question in the open-ended survey involved suggestions for improvements. The majority of the responses did not reflect the need to provide any enhancements of the content of the material. Additionally, there was a large group that did not use the mobile application and, therefore, did not comment on this section. However, those that provided feedback reflected design changes of the appearance of the mobile application versus content changes. This was enlightening that the content could be assumed to be beneficial and important, but the appearance needed to be modified to make it more visually pleasing. The interesting elements were that there were no comments specifically addressing the content of the mobile application, which could be assumed to be positive related to content (see Figure 6).

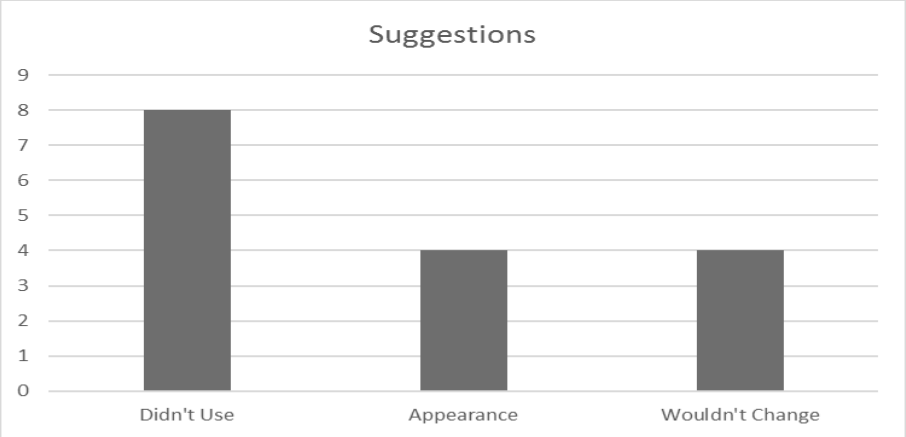

Figure 6. This graph reflects the sixth question themes with eight respondents not using the application. The other respondents were split with suggestions to change a few appearance elements or nothing at all.

A large group of the respondents did not use the mobile application. The exposure to the application was the same for all new graduate within this cohort. Therefore, the implications from this finding cause an examination of the method of exposure to the mobile application along with the potential need for continued exposure throughout the residency program versus an isolated evidence based practice module. Additionally, the marketing of this tool should be modified to allow for optimal amount of exposure and potential use for future cohorts. Roughly half of the respondents did not find the application necessary to complete their first EBP project.

Of the respondents that did use the mobile application, the responses were positive regarding the resources, information, and support that the mobile application could provide during the first EBP project development. The residents found the material included within the application to be valuable related to the steps of EBP, the methods to evaluate evidence,

and how to assign levels to the research related to a specific topic. These themes allowed for the project leads to comprehend the areas that new graduates were challenged when working on their own first EBP projects along with areas of potential future support.

A word cloud including all the different comments was developed and reflects the key words of the project as used, use, project, and internet (Appendix E). This word cloud can be related back to the themes that new graduates were using the mobile application to support their own development of an evidence based project and the interesting fact that many continued to utilize the internet to find information when seeking a resource. This word cloud is a summary of the 16 participant's responses.

The overall analysis was conducted within the program NVivo. Several nodes, which are known as themes, were identified within the analysis. The first node contained feedback that many new graduates did not use the mobile application. This allowed for further investigation of marketing this tool and asked further project feedback during focus groups to see the reasoning of not utilizing the application. The second highest node was the theme of using the internet for information versus a mobile application. This could have affected the use of this mobile application in the future and ensuring that validated internet information is being provided. The third highest node or theme was using the quick reference for various methods while at work. This reflected that new graduates were using the mobile application while working to develop their projects. The final node was of positive elements found within the mobile application. This reflected the positive perception of users about the mobile application and finding the resources useful to their

EBP project. It implied that this intervention was positive and continued development should continue.

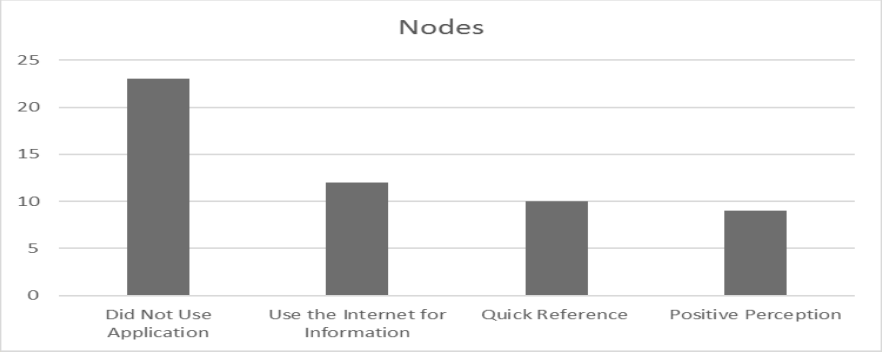

Figure 7. This figure reflects the main four nodes or categories found within the data.

Recommendations

Recommendations from the findings of this project included the concept of additional investigation into why the respondents did not utilize the mobile application. This investigation could have found elements that this student was not aware related to barriers for new graduates and find methods to potentially remove some of those barriers. Other recommendations included further investigation of the perception of the mobile application with additional cohorts of new graduates. These projects could have allowed for supplementary insight on benefits of the mobile application or areas that the mobile application is not addressing.

Continued support of the EBP mobile application is found with this project. The new graduate nurse residents that utilized the mobile application have a favorable perception of the resources that the mobile application provides. This positive reaction

implicated continued use for future cohorts in the NRP. The residents that would be participating in the Evidence Based Practice future modules would continue to be exposed to the mobile application and need to be tracked for future perception and impact of the mobile resource. The recommendations will also include to keep this mobile application available on both the Google Play Store along with the Apple Store for continued support of new graduate nurses within the organization. Future projects could also investigate exposure of this mobile application to other groups of nurses working with EBP projects and not just new graduate nurses. Additionally, the recommendation of promoting the mobile application since the themes were positive of those that utilized the application. This becomes an interesting recommendation since a large group of respondents did not use the mobile application to complete their project. However, those that utilized the application found the application helpful and useful.

Strengths and Limitations

Strengths of the project was the availability of the design to reach many new graduate nurses. Additionally, the population of this project is focused upon new graduate nurses, who have just completed their first EBP project and therefore, data has been gathered after potential recent use of the mobile application. A supplementary strength included that after the initial exposure of the mobile application participants could use the application as much or as little as they desired. This allowed for the new graduate to use while developing their own project and find the content useful or not useful with a personal project. Lastly, the final strength of the project was the mobile nature of the project to

support new graduates at the point they were completing a project and therefore, not only impact their perception during a formal classroom environment but also their perception during the entire NRP. Then, the feedback method was also designed to allow for all nurse residents to have the opportunity to provide their own perception of the mobile application and for the open-ended questions to only take five to ten minutes to complete.

However, in contrast to the strengths, there were multiple limitations to this project. The first was the low percentage of respondents from the over 120 potential candidates. Additionally, the open-ended survey style did allow for residents to provide one worded explanations without elaborating on the details, which left additional questions. Additional investigation should occur into this study to determine if other mobile applications are valued for this generation. Another limitation was the exposure of the mobile application compared to the time that the cohort was developing their own EBP project. There was a large amount of time between both events, which potentially played into the response rate along with the lack of use of the applications. Finally, the last limitation included that the data was collected after the presentation of the resident's final project. This also could have affected the response rate and the overall engagement with the survey along with the electronic format that there was no guarantee for the survey to be viewed during the three-time period for data collection.

Section 5: Dissemination Plan

The dissemination plan for these findings included completing this project and having it approved via Walden University's approval process. The next steps for dissemination included presenting the findings of this project to the health system's centralized education department that supports new graduate residents during their first year of practice. The results of this project have been important for this group to continue to support the exposure of evidence based practice along with the potential future use of the application. The final plan for dissemination was to present the findings of this project at the annual nursing research and evidence based practice day held within the health system.

Analysis of self

This project stretched my knowledge and abilities as I learned a new process and investigated the evidence for a project. I was challenged because I had to obtain IRB approval from two different organizations to be able to obtain data for this project. I was pushed not only with my personal writing ability but also a project management has increased drastically throughout the journey. I found methods to complete this project along and write the project paper. My growth throughout the program was drastic and culminated with this project.

Summary

The final elements of this evidence based project contain the concept that this was an innovative method of delivery information to new graduate nurses regarding evidence based practice. The overall impression of new graduates was positive, if the new graduate

used the mobile application while working on their own EBP project. The implications for this allowed for continued investigation of the use of mobile applications to continue to provide resources and information for new nurses. Additional projects can be completed to expose other populations of nurses to the mobile application to determine if the perception remained positive with groups other than new graduates.

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Appendix A: Roger's Diffusion of Innovations; Five Stages

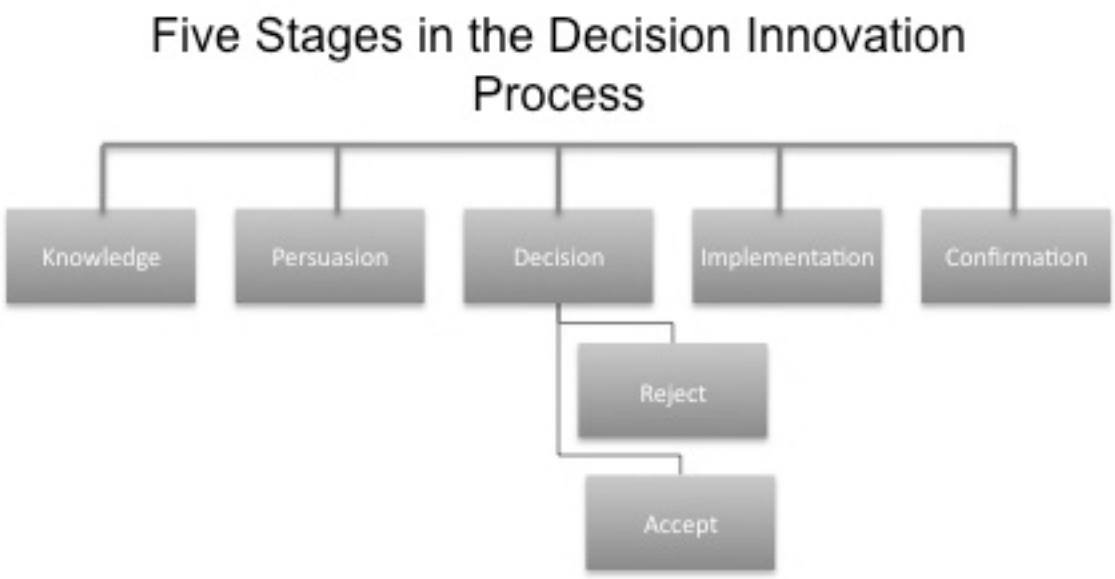


Figure 8. This figure reflects the five stages of decisions, which an individual will proceed through. The individual may reject or accept the innovative method during this time (Rogers, 2010).

Appendix B: Roger's Diffusion of Innovations; Curve

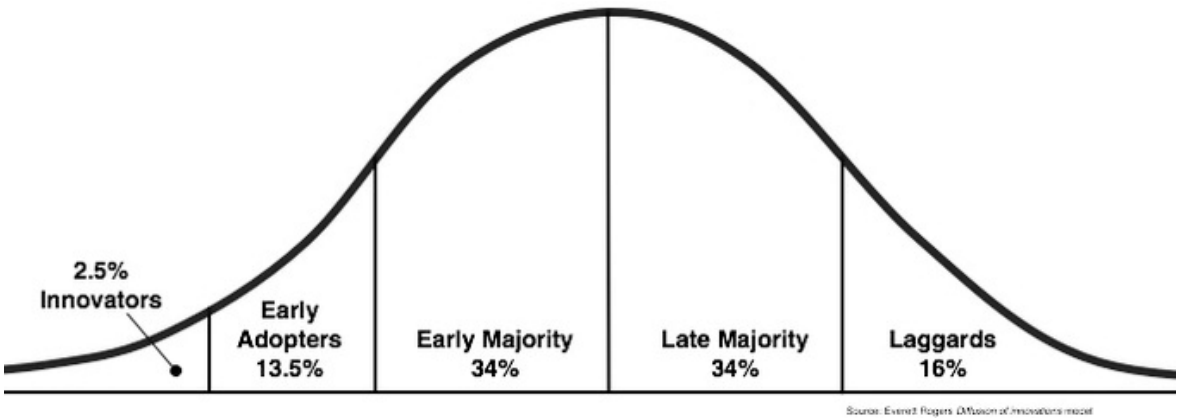


Figure 9. This figure reflects the curve that classifies adopters into various categories (Rogers, 2010).

Appendix C: Survey Questions

Opening at the top of the survey:

Hello and thank you for taking time to fill out this survey about your use of the EBP App during your residency experience. My name is Kristin Carlson, I am conducting this survey group as part of my DNP project and Quality Improvement project for the health system. This survey is completely voluntary and by participating you are providing your consent. I am interested to know what you like, what you don't like, and how the Evidence Based Practice App might be improved.

You were invited to complete this survey because you participated in the nurse residency program and you completed the EBP project.

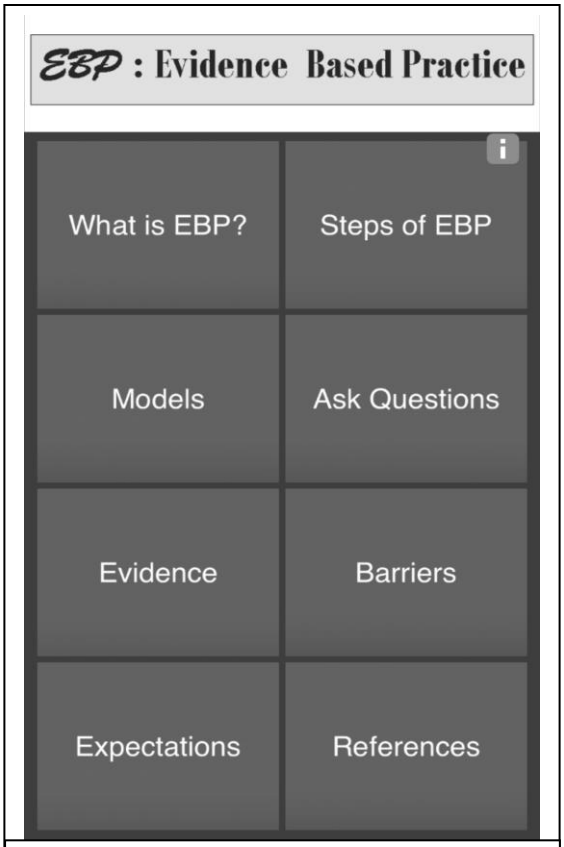
There are no wrong answers but just different perspectives. Please feel free to share your own point of view. Keep in mind that I am just as interested in negative comments as positive comments, and at times the negative comments are the most helpful.

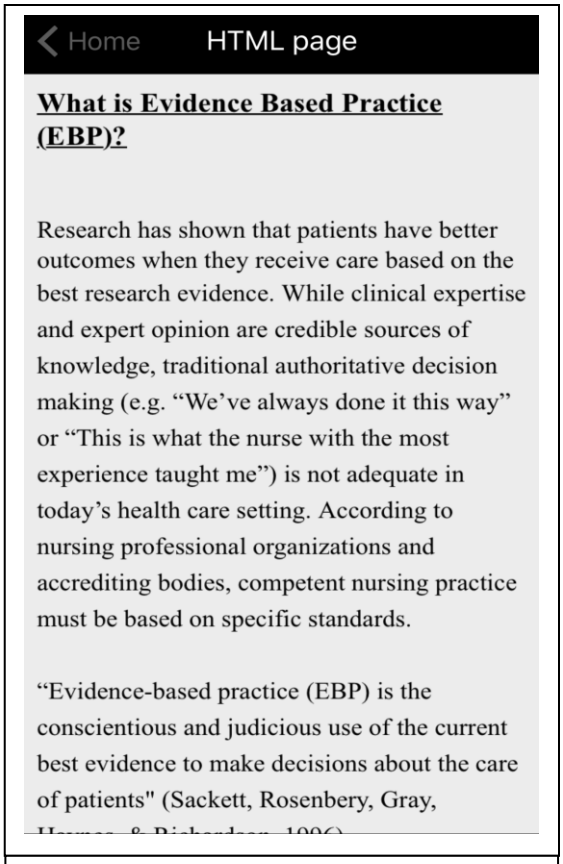
You may be assured of complete confidentiality when completing this survey. Only a content analysis and summary of the answers will be included in my project. Individual responses will not be shared and no identifiers will be included in this survey.

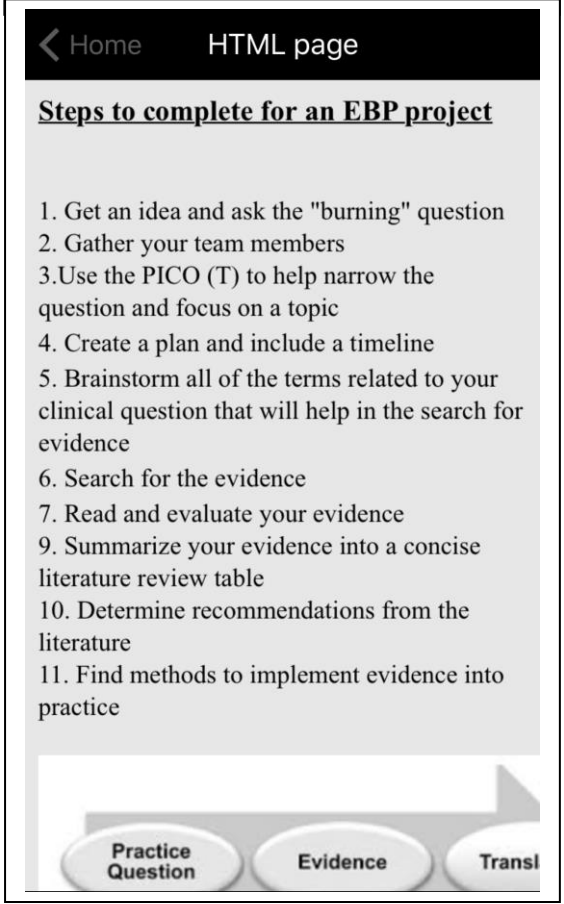
Questions:

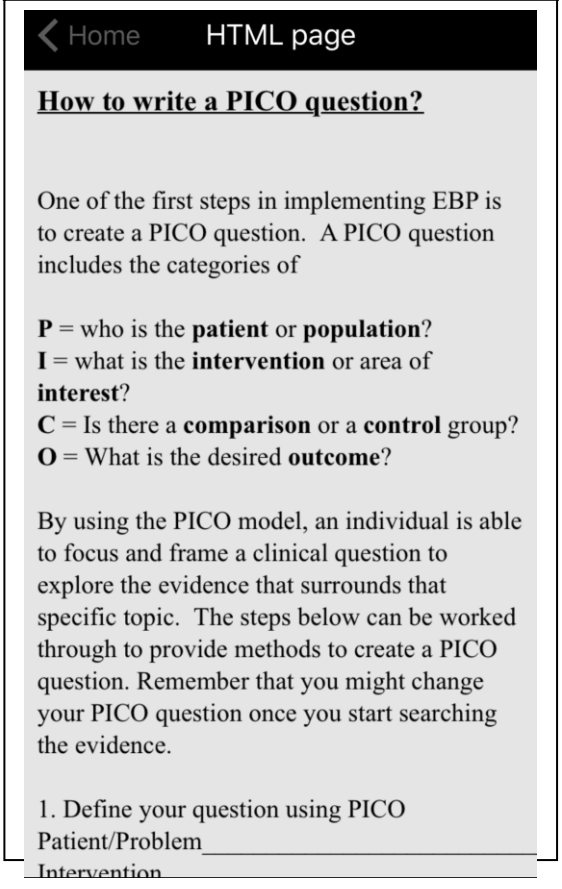
1. What is your experience using the mobile application?
2. What elements of the EBP mobile application did you use to develop or create your EBP project?
3. What elements were most helpful?
4. Where do you usually get new information?
5. How did you feel about using the EBP application to get information to support your EBP project?
6. Do you have suggestions for improvements or changes to the mobile application?

Appendix D: Mobile Application Screen Shots









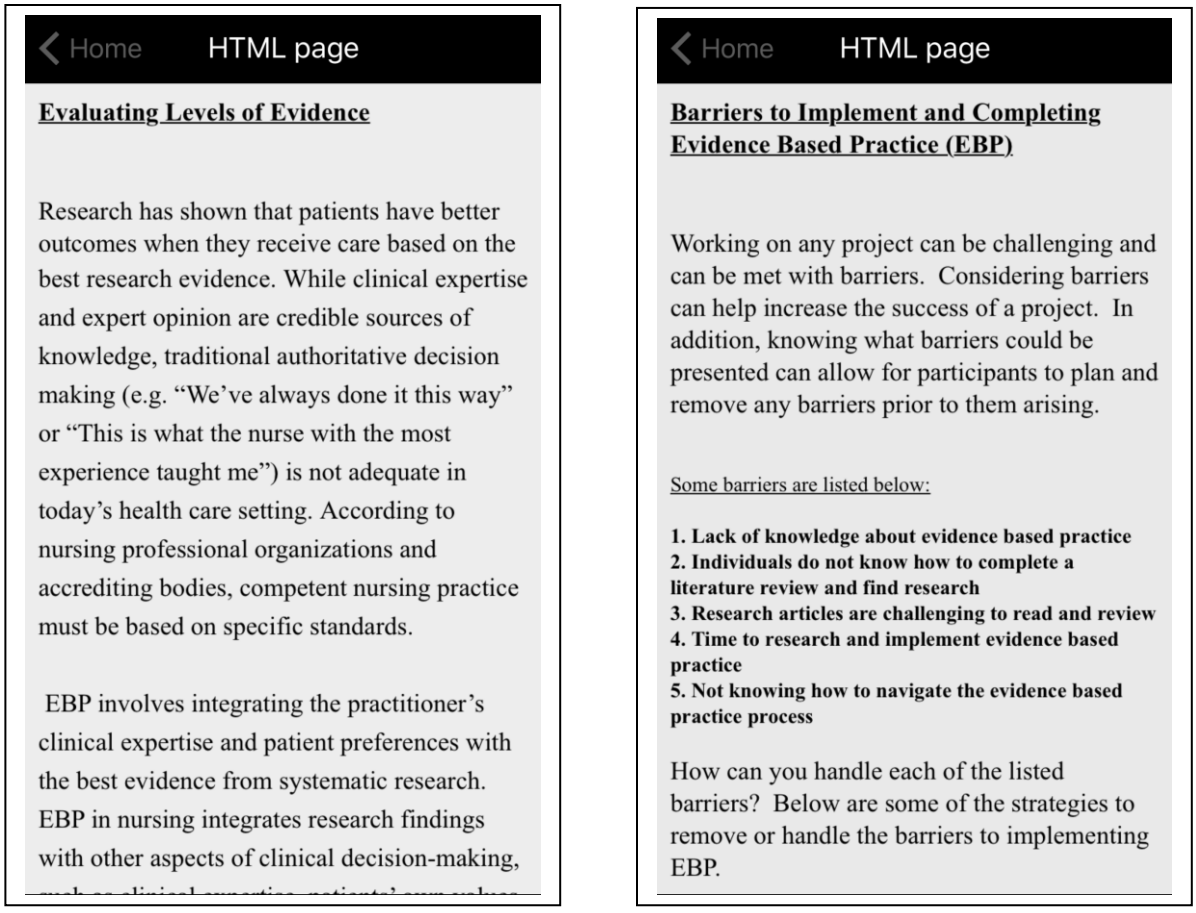


Figure 11. These six pictures reflect the mobile application screenshots of various resource pages.

Appendix E: Word Cloud

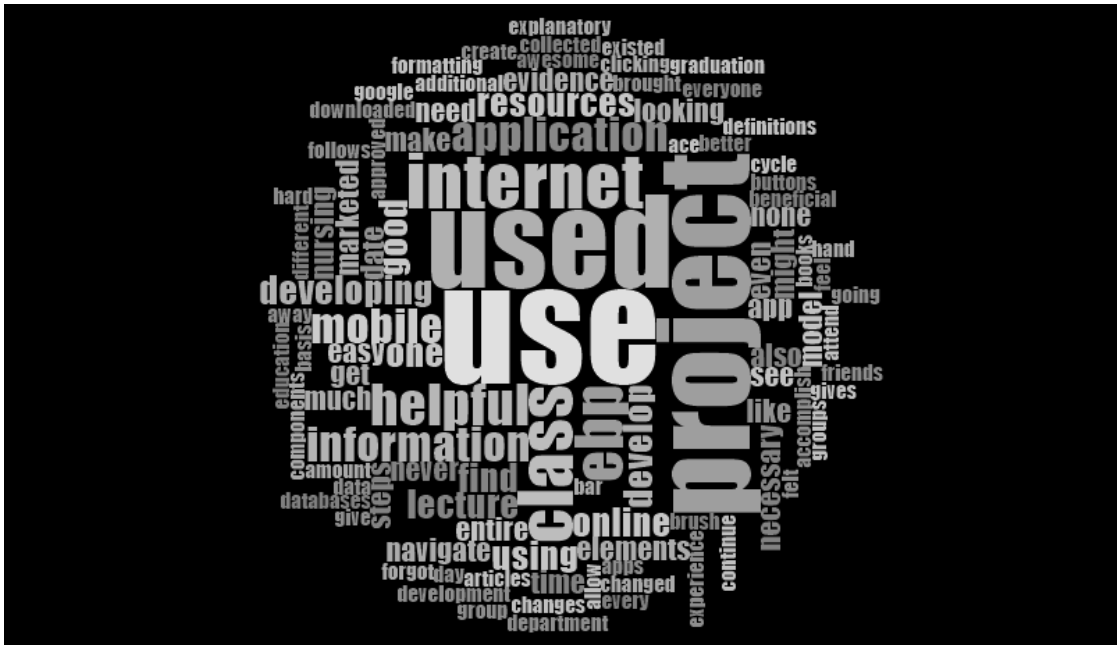


Figure 12. This word clouds reflects the survey results of use for the mobile application during the nurse resident's EBP project.