

NURSING ORIENTATION PROGRAMS AND THEIR EFFECT ON THE
RETENTION OF THE REGISTERED NURSE

by

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April 2012

DEDICATION

I would like to dedicate this paper to my husband Brent, son Tiegan, and my mother Lynette. Your love, support, and encouragement mean the world to me.

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ABSTRACT

This is a review of the current literature to discern what factors of a nursing orientation program are associated with the successful retention of the registered nurse in the acute care setting. An extensive search of the literature was performed by using the CINAHL® database to find full-text documents that were primary sources of research addressing nursing orientation programs and the successful retention of the registered nurse. A coding scheme was developed and applied to each article for analysis. Themes were then identified that included unit socialization, preceptor selection and training, and the length of orientation. Programs that: 1) provide for adequate socialization of the new nurse, 2) provide preceptors that were identified as educators and leaders and train them in their role, and 3) were at least six months in length were found to be the most successful at retaining the registered nurse.

CHAPTER 1

INTRODUCTION TO STUDY

Introduction

The United States is currently in the midst of a nursing shortage that is anticipated to worsen as the population continues to age and the baby boomers reach retirement age (Atencio, Cohen, & Gorenberg, 2003; Upenieks, 2003; Ackermann, Kenny, & Walker, 2007). This crisis is further compounded by the fact that educational facilities cannot educate nurses in numbers that will meet the current demands (Atencio, et al., 2003). Understaffed medical units can lead to nurse dissatisfaction and may present issues for patient satisfaction and safety (Atencio, et al., 2003). Ultimately, the failure to successfully retain registered nurses comes at a great fiscal and human cost (Atencio, et al., 2003).

Nursing orientation has been identified as a potential strategy for successful nursing retention. This literature review will identify themes and trends associated with nursing orientation programs that have been successful in retaining the registered nurse beyond the first year of employment. This knowledge can help hospital administrators and leadership to develop programs that will aid in the successful retention of the registered nurse in their own facilities.

Purpose of the Study

Orientation programs have been shown to be an important component to the successful retention of the registered nurse. Effective orientation programs increase an orientees' self-confidence by providing them with the information that they need in order to perform their job. Additionally, a lack of support and a feeling of not being accepted have been identified in the literature as a "major factor" causing nurses to leave employment during the first year (Marcum & West, 2004; Ward, 2009, p. 87). Orientation programs can be one way of providing employees a way to successfully integrate into the new unit's culture (Ward, 2009).

The purpose of this study is to conduct an integrative literature review to examine various types of orientation programs and their role in the successful retention of the registered nurse. From this information, themes can be discerned and recommendations can be developed regarding a preferred orientation program for new nurse employees.

Background and Significance

The Importance of Nurse Retention

Retaining newly hired employees is of paramount importance during a time when the availability of nurses is diminishing and the acuity of patients continues to rise. As the population continues to age, and health care continues to improve in its ability to prolong lives, the number of critically ill patients continues to grow—requiring increased nursing hours to care for these patients (Upenieks, 2003; Ackermann, Kenny, & Walker, 2007).

In addition, one-third of the nurses currently working are estimated to be over the age of 50, and in the next decade, large numbers are expected to retire (Atencio, et al., 2003). To further compound the problem, nursing schools are not graduating enough nurses to meet the current demands (Atencio, et al., 2003). Thus the development of methods with which to successfully retain nurses is imperative to today's nursing leadership.

Orientation's Link to Retention

A facility's orientation process is often closely linked to its ability to retain employees (Reese, 2005; Ward, 2009). Many times, orientation programs are inadequate due to a desire to rapidly integrate newly hired nurses into the workforce. This often leaves individuals feeling as if they have been "thrown to the wolves" or left to "sink or swim" (Reese, 2005, p. 10). Preceptor nurses are often required to maintain heavy workloads, and are not given enough time to provide learning experiences useful to the orienting nurse (Williamson-McBride, 2010). Poorly developed orientation programs also often lead to feelings of inadequacy and result in nurses leaving a position within their first year of employment (Ward, 2009). Effective orientation processes, therefore, should be considered as one of the most critical nurse-retention activities an organization undertakes from both a cost and retention perspective.

The Cost of Nurse Turnover

The retention of registered nurses is often the top goal of many health care organizations. Nurse turnover is costly. It is estimated that the cost of a nurse's turnover

ranges between 0.75 to 2.0 times the salary of the departing individual (Jones & Gates, 2007; Ward, 2009, p. 87). Currently, the national average salary of a medical-surgical nurse is around \$47,832—resulting in a potential cost of \$92,442 to replace one medical-surgical nurse (Halfer, Graf, & Sullivan, 2008; Ward, 2009, p.87). This number is even higher for a specialty area nurse and is estimated to be around \$145,000 (Halfer, et al., 2008).

These costs include expenses for items such as advertising and recruitment, overtime, use of agency nurses, additional orientation and training of a new employee, hospital diversion (when the patient is sent to another facility due to an inability to accept them for care), closed beds as well as lost productivity related to the vacancy, and an overall poor working environment (Jones & Gates 2007; Ward, 2009). In addition to the fiscal ramifications of poor nurse retention, high levels of turnover are also associated with poor patient outcomes and decreased quality of care (Atencio, Cohen, & Gorenberg, 2003).

Statement of the Problem

Facility orientation programs can vary greatly in complexity and time frame, from simple one day instruction to elaborate multi-day models (D'Aurizio, 2007). Due to the high cost of providing orientation for a nurse and because orientation is an integral aspect of nursing retention, it is vital that nursing leadership assess the effectiveness of their current orientation programs.

Literature exists that reviews various types of nursing orientation programs. Additionally, studies regarding the costs associated with both orientation programs, as well as nursing turnover, can easily be found. What is lacking is a systematic review of this literature in order to provide evidence-based recommendations regarding new nurse orientation programs that have the highest likelihood of retaining the registered nurse beyond the first year of employment.

Significance of the Study

This study is significant in that it can serve to provide valuable information regarding the improvements needed in existing nursing orientation processes. Information found, through an integrative review of the literature, can be used to develop an improved nursing orientation program with the intended results being an overall cost savings to acute care facilities as a result of the increased satisfaction and retention of newly hired nurses.

Research Question

The question that will be answered by this review is: What factors of a nursing orientation program are most successful in retaining the registered nurse in the acute care setting beyond the first year of employment?

Theoretical Framework

The conceptual framework chosen by the researcher for this study was Patricia Benner's Stages of Clinical Competence (Benner, 2001). This framework was chosen as a guide to this study because the model specifically relates to the development of new skills or skill set. Orientation is the integration of nurses into a new learning environment. When a nurse is newly hired to a unit, whether they are experienced or not, they are a novice or a beginner. Successful orientation programs work to create a pathway that helps to highlight competencies that must be achieved in order to ensure that a nurse moves successfully through the process of becoming an expert in their patient care area.

Benner described five stages of proficiency that an individual must pass through in order to go from a novice to an expert (Benner, 2001). These stages are based on the Dryfus Model of Skill Acquisition (1986) that proposed, in the development of a skill, an individual passes through five stages from novice to expert (Benner, 2001). Table 1 lists these five stages of clinical competence and their descriptions.

Table 1. Stages of Clinical Competence.

Stage 1: Novice	Beginner with no experience. Taught general rules in order to help them perform tasks. "Tell me what I need to do and I'll do it".
Stage 2: Advanced Beginner	Demonstrate acceptable performance. Has gained prior experience in actual situations to recognize recurring and meaningful components.

Table 1. Stages of Clinical Competence (continued)

<p>Stage 3: Competent A nurse with 2-3 years' experience on the job--in the same area or in similar day-to-day situations. More aware of long-term goals and bases own actions on conscious, abstract, and analytical thinking (Benner, 2001). Lacks the speed and flexibility of the proficient nurse.</p>
<p>Stage 4: Proficient Perceives and understands situations as whole parts. Learns from experiences what to expect in certain situations.</p>
<p>Stage 5: The Expert Has an intuitive grasp of each situation. Performance is fluid, flexible, and highly proficient.</p>

Source: Benner, P. (2001). From *Novice to Expert: Excellence and Power in Clinical Nursing Practice*.

Definition of Terms

The following terms were drawn from the research question in order to highlight factors associated with nursing orientation programs and to define for the researcher the terminology associated with nursing orientation programs.

1. **Orientation:** A means by which new staff nurses are introduced to the philosophies, goals, policy and procedures, position expectations, physical facilities, and services of a particular work environment (Greene & Puetzer, 2002, p.64).
2. **Competency:** The nurse's ability to demonstrate a set of skills and expectations within an established period (Marcum & West, 2004, p. 120).
3. **Mentor:** An experienced and competent staff nurse who serves as a role model and resource to new staff members (Greene & Puetzer, 2002, p. 64). Someone who will serve as an ally and supporter (Funderburk, 2008, p. E1-E2).

4. **Mentee:** A newly hired staff member who participates in an orientation program in a specific department (Greene & Puetzer, 2002, p.64).
5. **Mentorship:** A long-term relationship that involves sharing with the idea that each participant will benefit (Funderburk, 2008, p.E2).
6. **Preceptor:** An experienced staff nurse assigned for a set period of time to assist newly hired nurses based on their knowledge and skills as well as their experience in the given area (Kanaskie, 2006, p. 248).
7. **Preceptorship:** an organized instructional program in which nurse preceptors facilitate the integration of a newly employed nursing staff in to the role responsibilities of the work setting (Greene & Puetzer, 2002, p.64).
8. **Newly graduated registered nurse:** a registered nurse who has passed the NCLEX exam within one year of hire (Friedman, Cooper, Click, & Fitzpatrick, 2011, p.9).
9. **Retention:** the percentage of employees employed at the beginning of a period who remain with the company at the end of the period (Ward, 2009, p.89).

Limitations

The study had the following limitations:

1. Studies included in the integrative literature review may include orientation programs for nurses working in a variety of departments including, but not limited to, critical care, medical/surgical, peri-operative, and the operating room (OR). Different orientation programs may prove to be more effective in

particular departments and the resulting research findings may not be easily generalizable.

2. Studies included in the integrative literature review were conducted on nurses working for various types of facilities including, but not limited to, acute care and long term care facilities. Different orientation programs may prove to be more effective in particular facilities and the resultant research findings may not be easily generalizable.
3. Studies reviewed were conducted at facilities of various sizes and locations. Programs that were found to be very effective in larger, metropolitan hospitals may not work as well for smaller or more rural facilities. This could be for a variety of reasons including resources (financial and otherwise). These differences again may have an effect on the generalizability of the research findings.
4. Studies reviewed were included both newly graduated as well as experienced nurses. The needs of the newly graduated nurse will likely vary from the needs of the more experienced RN. This difference may make the resultant research findings difficult to generalize.
5. Inconsistent use of search terminology may result in the researcher being unable to recover eligible, high quality studies (Knafl & Whitemore, 2005).
6. The large amount of information available regarding this topic may make it difficult to identify all pertinent studies and primary sources.

7. Publication bias may be present, making it easier to find articles containing “positive” results easier to find than those with non-significant results (Polit & Beck, 2011, pp. 657-658).

Assumptions

This study includes the following assumptions:

1. Retention will have occurred if the nurse remains employed by the organization one year from the date that their orientation originally began (Ward, 2009).
2. Consistent with Benner (2001), the researcher believes that the most successful orientation programs are those that provide a pathway to develop the nurse from a novice to an expert of their care environment.

CHAPTER 2

LITERATURE REVIEW

Inclusion/Exclusion Criteria

Because of the large volume of information available on the subject of nursing orientation and its effects on retention, inclusion and exclusion criteria were clearly outlined in order to identify the sample population. First, dates of publication were limited to the past five years, spanning from 2005 to 2011, and articles were limited to only those that were available as a full text document. The basis of this decision was to keep the literature as current as is possible and to provide only a small picture of the information that is available while identifying pertinent gaps that may exist.

Second, articles from only peer-reviewed journals were used in order to maintain a high level of quality. In addition, only primary sources of research were selected. Secondary sources can provide a good overview of a topic as well as references that may be of value, but may fail to provide needed details about studies, are seldom entirely objective and not considered good sources on which to build an evidence base (Polit & Beck, 2011). Therefore, secondary sources should be excluded from an integrative literature review (Polit & Beck, 2011).

Last, all articles were written in English and all research was limited to that taking place in the United States. This criteria was chosen in order to further limit the overall amount of articles available. Additionally, although orientation of the registered nurse is likely a global phenomenon, cultural—and economic--differences may lead to

confounding variables regarding what factors ensure successful nursing orientation programs. Therefore, the elimination of research conducted internationally revealed information that may be more relevant to facilities on a more local level.

Over one thousand articles related to the orientation and retention of the registered nurse was initially found. The following groups of articles were excluded from the final review: 1) research that did not address the cause and effect relationship between orientation and retention sought by the researcher, 2) studies that used alternative definitions of the terms orientation and retention, 3) research that failed to specifically highlight the credentials of the nursing staff involved, 4) studies that described success by conducting post-orientation surveys in order to measure success of the program itself, and 5) research that was conducted outside of the acute care setting.

Search Methods

Databases. The database to be used for this review will be the Cumulative Index of Nursing and Allied Health Literature (CINAHL®). CINAHL® was chosen as it provided access to “virtually all English-language nursing and allied health journals” (Polit & Beck, 2011, p. 100).

Search Terms. The search terms were drawn both from the research question as well as the conceptual framework. The keywords used, in various combinations, to search the CINAHL® database included: 1) orientation, 2) retention, 3) preceptor, 4) residency, 5) registered nurse, 6) RN, 7) acute care, 8) research, 9) nursing orientation, and 10) Benner. Titles, abstracts, and texts were all reviewed in order to assess the fit of

the article with the stated inclusion criteria. Duplicate articles found in successive searches were excluded.

Findings

The search term *orientation* yielded 2,699 results. To further narrow the results, the terms *orientation* and *retention* were used together. This produced 102 results, from which six articles were selected after meeting the inclusion criteria. When the terms *orientation*, *retention*, and *registered nurse* were used together two results were obtained and one was included after meeting the inclusion criteria (Kooker & Kamikawa, 2010).

The terms *orientation* and *RN* resulted in twenty-two results. One of these was duplication (Kooker & Kamikawa, 2010). Two of these articles were selected based on the inclusion criteria (Halfer et al., 2008; Friedman et al., 2011). The remaining nineteen articles did not meet criteria for inclusion in this literature review.

A search using the terms of *orientation*, *retention*, and *RN* resulted in five articles. Three of these articles were duplicate articles (Friedman et al., 2011; Kooker & Kamikawa, 2010; Halfer et al., 2008) and two did not meet inclusion criteria (Issac, 2003; Bowles & Candela, 2005).

When the terms *residency* and *registered nurse* were used, one article was found that did not meet the inclusion criteria (Block & Norton, 2008). The terms *residency* and *RN* resulted in seven articles. Two were duplicate articles (Friedman et al., 2011; Halfer et al., 2008). The remaining five articles did not meet the inclusion criteria.

A search of the terms *Benner* and *orientation* resulted in one article that did not meet the inclusion criteria (Duke et al., 2009). Similarly, *Benner* and *retention* also resulted in one article that did not meet inclusion criteria (Lepman, 2006).

The terms *retention*, *orientation*, and *nursing* were used together and resulted in sixty-one articles. Of these, five articles met the inclusion criteria. A search with the term nursing *orientation* resulted in sixty-five articles, and one article met the inclusion criteria (Cavanaugh & Huse, 2004).

Supplemental Search Methods

Ancestry searches were also done on all the articles collected from the previous method in order to identify any pertinent studies not found in the CINAHL® database. In all a total of thirteen articles were selected utilizing this method.

CHAPTER 3

METHODS

Rights of Human Subjects and Consent Process

No human subjects were involved in the completion of this literature review. Therefore, an Institutional Review Board (IRB) review was not required. This was confirmed via email by Cheryl Johnson, administrator of the Montana State University IRB office, on April 19, 2011 (Appendix A). Additionally, according to the literature, research involving the “collection or study of existing data, documents, records, pathologic specimens, if the sources are publicly available...” are exempt from institutional review board review (Polit & Hungler, 1999, p.146).

Study Design

The design was that of an integrative literature review. Polit and Hangler (1999) state that one of the major functions of an integrative literature review is to determine what is already known related to a particular problem of interest (p. 80). By becoming acquainted with the current state of knowledge, individuals engaged in research are able to avoid unintentionally duplicating studies and are able to focus on areas where little is known about a particular subject (Polit & Hangler, 1999).

In addition, by learning about the current state of knowledge, nurses who are not researchers are able to learn about current trends with regards to a particular issue (Polit

& Hangler, 1999). This knowledge can then be used to improve their practice or identify potential solutions to problems (Polit & Hangler, 1999).

Quality of the Literature

Each study was critiqued for quality. Guidelines created by Kmet, Lee, and Cook (2004) were used to evaluate the research and to give each study a quality score (see Appendix E). Each “yes” answer to a guideline questions received two points, each “partial” response one point, and each “no” or “not applicable” response received zero points. The points were then totaled and divided by the total sum. The total sum was achieved by subtracting the number of questions answered “not applicable” from a total possible number of twenty-eight questions. This process resulted in a quality score that was used to identify the most robust of the studies included in this literature review.

Coding Scheme. Each study was then analyzed and coded for a variety of variables in order to extract relevant information about study characteristics, methods, and findings (Polit & Beck, 2012). These codes were derived from the literature, and included factors related to the nursing orientation program such as program type, program length, program components, and program participants. This information was then compiled into a results matrix (see Appendix D). Through the analysis of this information, patterns and themes were discerned, gaps in the research identified, and recommendations made.

CHAPTER 4

RESULTS

Summary of the Literature

A total of twenty-eight studies were analyzed for research quality as well as for the factors that are associated with the successful retention of the registered nurse (see Appendix B). Two studies were mixed qualitative-quantitative in design (Almada, Carafoli, Flattery, French, & McNamara, 2004; Anderson, Allen, Linden, & Gibbs, 2009), while the remaining twenty-six studies utilized a quantitative design. All twenty-eight of the studies utilized a retrospective descriptive design measuring two separate groups of nurses both before and after the interventions (nursing orientation program) were implemented. In addition, all of the studies were conducted in acute care facilities within the United States.

Quality

Each study was assessed for research quality using criteria set forth by Kmet, Lee, and Cook (2004) (see Appendix E). After applying the criteria individually to each study, a quality score was determined (see Appendix B). Eight studies tied for the highest quality score (see Table 2).

Table 2. Studies Tied for the Highest Quality Score.

Beercroft, Kunzman, & Krozek, 2001
Cavanaugh & Huse, 2004
Crimlisk, McNulty, & Francione, 2002
Friedman, Cooper, Click, & Fitzpatrick, 2011
Fox, 2010
Halfer, Stoffers, Kelly, Redding, & Carr, 2011
Messmen, Bragg, & Williams, 2011
Morris, Pfifer, Catalano, Fortney, Nelson, Rabito, & Harap, 2009

Literature Related to Nursing Orientation

Table 3 describes the three themes that were identified in the literature related to nursing orientation and literature that is related to each theme.

Table 3. Themes and Literature.

Themes	Studies with Theme
Unit Socialization	Anderson et al., 2009; Friedman et al., 2011; Gavlak, 2007; Gomes, 2009; Greene & Putzer, 2002; Halfer, 2007; Hatler et al., 2011; Hamilton et al., 1989; Mathews & Nunley, 1992; Speers, 2002
Preceptor Selection and Training	Cavanaugh & Huse, 2004; Collins & Thomas; Fox, 2010; Gomes et al., 2009; Halfer, 2007; Hatler et al., 2008; Marcum & West, 2004; Speers, 2002
Length of Orientation	Anderson et al., 2009; Almada et al., 2004; Crimlisk et al., 2002; Courney, 2005; Friedman et al., 2011; Fox, 2010; Golden, 2008; Gomes et al., 2009; Greene & Puetzer, 2002; Halfer, 2007; Hamilton et al., 1989; Klein, 2009; Kooker & Kamikawa, 2010; Marcum & West, 2004; Morris et al., 2009; Speers, 2002; Woodward, Kelly, & Gifford, 2011

Themes

Unit Socialization. Two major themes emerged as factors that contribute to a successful orientation program. One chief theme related to the important role that the socialization of a new employee into a unit plays in the successful retention of nurses. Friedman et al. (2011) described the crucial relationship between the mentor and the new nurse, particularly a new graduate RN, in ensuring that the transition from novice to advanced beginner occurs as outlined by Benner (Benner, 2001).

Six studies (Gavlak, 2007; Gomes et al., 2009; Greene & Puetzer, 2002; Halfer, 2007; Hamilton et al., 1989; Speers, 2002) described the challenges experienced by the new graduate in transitioning to the role of the registered nurse. They demonstrated the important connection with a mentor or preceptor as a successful way of easing the anxiety and stressors associated with this transition. The mentor or preceptor serves as a role model of positive behavior, a “socialize” (increasing the graduate nurse’s sense of belonging on their unit) and an educator (educating them in specific tasks and interactions). Anderson et al. (2009) highlighted the perceived importance of teamwork and identified the preceptors and mentors as assisting the new nurse to feel supported and helping them feel as if they belonged.

Mathews and Nunley (1992) describe an orientation program that was focused on activities that would integrate new nurses into the peer unit and teach them how to function within their institution. These tasks were termed socialization and induction. Socialization was defined as “a complex process directed at the acquisition of appropriate attitudes, cognitive emotions, values, motivations, skills, and knowledge and social

patterns necessary to cope with the social and professional environment” (p. 161).

Induction was defined as “the act of bringing nurses into the existing cultural system and making them feel welcome” (p. 161).

Hatler et al. (2011) outlined a new employee staff retreat that was held with groups focused on creating a welcoming environment. Topics highlighted included improving communication and peer recognition. Activities were also conducted to promote team building and review conflict management strategies.

Preceptor Selection and Training

Several studies also identified a theme related to the importance of selecting preceptors for their orientation program. Cavanaugh et al. (2004) stated that preceptor selection, preparation, development, and facilitation of their empowerment are “the most important steps in the process (of program planning)” (p.253). Preceptors were selected based on expert knowledge and commitment to mentoring staff and underwent training during a three day session. Courses offered included a general preceptor workshop as well as specialty courses. In addition, each orientee was provided with two preceptors. This was to prevent preceptor fatigue as well as to provide consistent coverage for all clinical days.

Studies by Collins & Thomas (2005), Fox (2010), Gomes et al., (2009), Hatler et al., Marcum & West (2004), and Speers (2002) all utilize a method of preceptor selection involving both application and interview or selection tools with predefined acceptance criteria. Gomes et al. (2009) also emphasize the importance of pairing preceptors and orientees utilizing principles of teaching-learning theory and learning styles.

Halfer (2007) and Gomes et al. (2009) described orientation programs where preceptor training played a critical role. Preceptors in both studies received education and mentoring from the facility's nursing clinical educators. Preparation for the role was achieved through a "blended learning approach" that involved web-based education followed by a live workshop where the preceptors learned about generational differences and basic concepts of teaching-learning theory. In contrast, Revis et al. (1996) and Speers (2002) suggested day long preceptor training.

Length of Orientation

The length of orientation also appeared to be an important factor related to the successful retention of the newly hired nurse. However, the literature included in this study did not provide a clear answer as to the ideal orientation time frame. Seventeen studies had an orientation period of six months or longer (n=61%) (see Table 4). Six studies (n=21%) had an orientation period that was six months to one year in length (see Table 4). Eleven (n=39%) of the studies had an orientation period that was one year or greater (see Table 4).

Table 4. Length of Orientation.

Length of Orientation	Studies with Length of Orientation
6 months to 1 year	Almada et al., 2004; Beecroft et al., 2001; Collins & Thomas, 2005; Crimlisk et al., 2002; Looker & Kamikawa, 2010; Speers, 2002
≥ 1 year	Anderson, 2009; Cavonaugh & Huse, 2004; Collins & Thomas, 2005; Courney, 2005; Friedman et al., 2011; Fox, 2010; Greene et al., 2002; Halfer, 2007; Hamilton, 1989; Klien, 2009; Marcum & West, 2004

Gomes et al. (2009) utilized a staged progression drawn from Maslow's Hierarchy of Needs (Maslow, 1943). This method of orientation allowed the orientee to build on his or her existing skill set and level of knowledge. Prior to moving on to the next phase of orientation, competencies had to be validated. Loose timeframes for progress were established, but a great deal of flexibility in terms of timeframe was allowed. Morris et al. (2009) had a similar methodology, utilizing clinical pathways based on previous competencies and nursing experiences of the orientees. Golden (2008) described a similar process with "orientation tracks" for each specialty of nursing based on Benner's Novice to Expert theory (Benner, 2001). Woodward et al. (2010) highlight an orientation program where skills and content are separated into phases and were tailored to each individual's needs.

Gaps in the Literature

Orientation of The Experienced Nurse

Twenty-one of the twenty-eight (n=79%) studies addressed the orientation and retention of the newly graduated registered nurse. Only four (14%) of the studies addressed the successful retention of the experienced nurse (Cavanaugh & Huse, 2004; Greene & Puetzer, 2002; Speers, 2002, & Woodward, Kelly, & Gifford, 2011).

Orientation Components that are Problematic

Of the twenty-eight studies that were reviewed, twenty-seven (n=96%) were successful in retaining their respective nursing populations. Only one study had no change in retention rates two years after the implementation of their orientation program

(Morris, Pfifer, Catalano, Fortney, Nelson, Rabito, & Harap, 2009). The discussion of factors, unsuccessful in retaining the registered nurse, has either not been well studied, or is absent from wide spread publication.

Conclusion

In order to clarify the link between nursing orientation and retention, a coding scheme was developed and applied to the literature in a systematic fashion. Although eighteen codes related to nursing orientation components were identified, not all were readily found in the literature included in this review. Several themes of successful orientation programs were identified and include the successful assimilation of the newly hired nurse into the existing unit's culture, adequate preceptor selection and training methods, and length of orientation.

Several gaps in the literature were also identified. These included a lack of literature highlighting the successful orientation and retention of the experienced registered nurse and studies outlining orientation programs that were not successful in retaining their respective nursing populations. Understanding both the successes, as well as the failures, of nursing orientation is essential in order for a facility to creating a program that is ultimately successful in retaining the desired nursing population.

CHAPTER 5

CONCLUSION

Introduction

In the preceding chapter, the results of the integrative literature review data were reported. This chapter will consist of a summary of the study, discussion of its findings, study limitations, implications for practice, management, and education, recommendations for research, and conclusions. The purpose of this chapter is to expand upon the concepts that were studied in an effort to provide a further understanding of their possible influence on nursing leadership and present suggestions for future research directed at understanding nursing orientation programs and their effect on the retention of the registered nurse.

Summary of the Study

The purpose of this integrative literature review was to analyze quantitative studies in the existing literature to determine the types of orientation programs that were successful in helping facilities to retain registered nurses beyond the first year of employment. Over 100 studies related to the orientation of the registered nurse were initially found. However, studies that were qualitative in design, as well as anecdotal evidence, were not included in this review.

The quality of each study included was analyzed utilizing guidelines set forth by Kmet, Lee, and Cook (2006) (see Appendix D). A coding scheme was developed and

applied to each article and three main themes emerged that included unit socialization, preceptor selection and training, and length of orientation. Gaps and limitations in the literature were also identified.

Discussion of the Findings

Unit Socialization

A total of ten (n=36%) of the studies included in this literature review highlighted the importance of adequate socialization of the new employee (see Table 3). All ten of these studies highlighted the role that the preceptor or mentor played in this transition from novice to expert. In addition, only one study did not discuss any form of mentoring or preceptorship as a part of its formal orientation program (Messmer, Brag, & Williams, 2011), further highlighting the essential role of the mentor or preceptor in the socialization process.

The importance of feeling welcomed and accepted into a new unit is closely related to whether or not a nurse will continue their employment on a particular unit or with a particular agency (Curtis, 2007; Erenstein & McCaffrey, 2007). Adequate socialization into a unit, or lack thereof, can have even larger implications as well (Curtis, 2007). Curtis et al. (2007) found that as many of 72% of nursing students felt that nurses “eat their young”. Among those who had experienced such horizontal violence, 90% agreed the experience would impact their career and future employment choices. Thus, it is likely that orientation programs that encourage new nurses to feel welcome, safe, valued, and nurtured will ease their transition and may improve their overall satisfaction.

Preceptor Selection and Training

Preceptor role models are a valuable effective method of orientation. In addition, the more long-term mentoring relationship may also be valuable in developing the growth of new nurses as well as supporting career advancement. According to Anderson (2008), the preceptor is a “key influence” to reducing the turnover of nurses in their first year of hire (p. 1). Preceptors and mentors should be carefully chosen for their role based on criteria beyond their shift or the adequacy of their clinical skills (Anderson, 2008).

Additional literature supported the need for the formal training of the nursing preceptor. Cost-analysis of preceptor training indicated that, over time, the investment that a facility makes to properly train their preceptors will be returned (Baggot et al., 2005).

A total of eight studies (n=29%) included in this literature review highlighted a process for selecting and or training their staff in the role of the preceptor or mentor (see Table 3). No one process of preceptor training that was reviewed was consistently identified as the preferred method. In fact, among the hospitals that were studied in this review there was a disparity in the length and type of training the preceptors received as well as the proper method of preceptor designation to use.

The importance of assigning a single preceptor to the new nurse as an effective means of increasing the nurse’s level of competency is also described in the literature (Keahey, 2008). In contrast, Cavanaugh et al. (2004) described a process involving the use of two assigned preceptors to prevent preceptor fatigue. Bratt (2009), indicated that

ideal preceptors should be “self-motivated, confident, assertive, professional, approachable, non-judgmental listeners, and passionate about nursing” (p.423).

Length of Orientation

Faced with staffing shortages and unhappy staff, facilities may often be all too eager to integrate newly hired staff into their unit without offering an adequate orientation period (Reese, 2005; Ackermann et al., 2007; Bullock, Groft, & Terhaar, 2011).

Although the adequate orientation period is likely to vary for each individual nurse, two studies found that nurses felt orientation periods should be longer than they are currently receiving (Noseworthy & Harnet, 2002; Remus, Smith, & Schissel, 2000). Four studies highlighted successful orientation programs that utilized an orientation period that was based on the individuals’ progression through a pre-defined set of competencies rather than on a pre-determined time frame (Gomes et al., 2009; Morris et al., 2009; Golden, 2008; Woodward et al., 2010). According to a study done by Janes et al. (2002), the newly graduated nurse may require as much as six or seven months before feeling comfortable taking on full patient care responsibilities, further supporting the need for longer orientation programs—especially for new graduates.

Adequate orientation length clearly plays a role in the successful retention of the newly hired nurse. Seventeen (n=82%) of the studies had an orientation period of at least six months, with eleven studies (n=39%) identifying an orientation program that lasted a year or greater (see Table 4). Although the literature included in this study does not clearly define the adequate timeframe for a successful orientation program,

recommendations can be made that facilities implement orientation programs that are at least six months in length.

Similar Study

A study that was similar to this review, but focusing on the retention of the newly graduated registered nurse was conducted by Jones & Park (2010). This was a literature review that compared studies from 1996 to 2007, analyzing orientation programs effectiveness in retaining the new graduate nurse.

The findings of the review suggest that orientation programs geared toward the newly graduated registered nurse were successful at improving their confidence and enhancing their clinical and critical-thinking skills in the clinical environment as well as having a positive correlation with improved retention beyond the first year of employment (Jones & Park, 2010). Studies in this review provided a wide variability in the length of orientation, with program length ranging from six weeks to one year.

The results from Jones & Park (2010) were similar to the findings of this integrative literature review, suggesting a correlation between a comprehensive nursing orientation program and the successful retention of the desired nursing population. They also found a wide variability of time frames for length of orientation with programs being a minimum of six months to one year in length. However, as this review was limited to only the retention of the newly graduated nurse, it is unclear what, if any, strategies would also be successful in retaining the experienced registered nurse—an important part of the current workforce.

Limitations

Scientific Evaluation

Although themes have emerged from this integrative literature review, no attempt was found that analyzed the effects each individual variable of an orientation program had on the overall success of that program. This may be because of the ease with which an orientation program could be evaluated in its entirety. This evaluation can be done retrospectively and does not require that subjects be placed into control or experimental groups with sampling done by utilizing convenience methodology.

Publication Bias

Of the twenty-eight studies that were reviewed, twenty-seven (n=96%) reported success in retaining the respective nursing populations. Only one study had no change in retention rates two years after the implementation of their orientation program (Morris, Pfifer, Catalano, Fortney, Nelson, Rabito, & Harap, 2009). The discussion of what factors were not successful in the retaining registered nurses has either not been extensively studied, or has not been widely disseminated.

Sample Size

Sample size is an important feature of a quantitative study. In general, the largest sample possible should be utilized (Polit & Beck, 2011). This is because the larger the sample size, the more representative of the entire population the sample is likely to be (Polit & Beck, 2011). The samples included in this literature review were relatively small (range of 7-150) and each were limited to only a single facility, therefore,

potentially undermining statistical conclusion validity (Polit & Beck, 2011). This is because when sample size is too small, data may be gathered that does not support the hypothesis, even when the hypothesis is correct (Polit & Beck, 2011).

Implications for Nursing

Clinical Practice

The United States is currently in the midst of a nursing shortage that is only expected to intensify as society ages and health care needs continue to grow (Thompson & Brown, 2002; Upenieks, 2003). This problem is only compounded by the fact that colleges and universities are struggling to produce nurses at a rate that can meet the rising level of demand (Atencio et al., 2003).

Addressing these nursing shortages requires efforts aimed at the recruitment and successful retention of the registered nurse (Cvach & Lyndon, 2003; Lott, 2006). One potential retention strategy is a successful orientation program (Reese, 2005; Lott, 2006). Orientation programs can be seen as strategically important to an organization, offering new recruits a first, and likely lasting, impression of the facility and affording them the time to develop an understanding of the organization and its values (Conley, Branowicki, & Hanley, 2007).

Although it is difficult to determine from the literature what makes an orientation program unsuccessful, it is clear that adequate orientation programs are directly related to nurse satisfaction and retention (Jones & Gates, 2007). Based on the results of this integrative literature review, a program that promotes unit socialization, adequate training

and selection of its preceptors and mentors, and is at least six months in length is likely to aid in the successful retention of the nurse past the initial year of employment.

Management and Patient Safety

Quality of care is an important measurement for health care facilities. There is a known relationship that exists between adequate staffing and patient safety (Attencio, Cohen, & Gorenberg, 2003; Jones & Gates, 2007; Shermont & Krepcio, 2006; Studer, 2004; Jones, 2008; Reese, 2005). Not only does frequent nurse turnover create a high cost for a health care facility in terms of dollars, but the failure to retain nurses can come at a high human cost as well (Jones & Gates, 2007; Studer, 2004; Jones, 2008; Shermont & Krepcio, 2006; Reese, 2005).

When there is an inadequate ratio of nurses to patients or the number of inexperienced nurses on a unit exceeds the number of experienced RNs, there is an increase in poor patient outcomes (i.e. increase in falls, pressure ulcers, and hospital acquired infections) (Jones & Gates, 2007; Studer, 2004; MacPhee, Ellis, & McCutcheon, 2006). Failure to successfully retain nurses leads to poorer patient outcomes and decreased patient satisfaction, all affecting the hospitals' bottom line (Jones & Gates, 2007; Studer, 2004; Jones, 2008). It could be argued that providing adequate nursing orientation is the first step towards providing a safe care environment and as a result, improving quality of care.

This researcher also recommends the development of evidence-based *Guidelines for Nursing Orientation*. Such guidelines would provide both employers as well as nurses with direction regarding the key elements of an orientation program, ensuring that

all nurses receive a consistent and adequate orientation. These guidelines would identify the best practices and set the standard for orientation programs across the country. The United States lacks any such guidelines to date. However, in reviewing the literature, it was found that the Association of Registered Nurses of Newfoundland and Labrador in Canada released their “Orientation of the Registered Nurse: Best Practice Guidelines” in 2003, and it is the opinion of this writer that the United States should follow suit.

Research

Findings of this literature review suggested a close relationship between a facility’s orientation programs and the retention of the registered nurse. Although this study was successful in identifying themes associated with successful orientation programs, the literature does not highlight the contribution of each of the individual components of an orientation program and to what extent they are each related to nursing retention. This researcher suggests additional quantitative studies that explore the relationship between these individual factors and their individual effect on determining the overall success of an orientation program. This information would increase nursing knowledge and would better allow for the development of highly successful nursing orientation programs that include only those factors that positively effect nursing retention and eliminating components of little or no overall value.

Conclusion

The successful retention of the registered nurse should be a top concern for all health care facilities. Not only does frequent turnover effect the facilities’ bottom line in

terms of the direct costs of orientation, but also indirectly by leading to increased patient morbidity, mortality, and decreased patient satisfaction (Greene, 2010; Jones, 2008)

A wide variety of nursing orientation programs can be found in the literature. These programs vary in both complexity and timeframes. Though no one study found in the literature points to a single evidence-based program that has been highly successful in the retention of the registered nurse, a thorough review and analysis of the literature does reveal three dominant themes included in successful orientation programs: unit socialization, preceptor selection and training, and length of orientation.

The importance of nursing retention will intensify as the nursing shortage continues to grow, in part, because the recruitment of qualified nurses will become increasingly more difficult. Further research is needed to identify the role that individual factors play in determining the overall success of nursing orientation programs. In addition, the field of nursing would benefit from published guidelines for nursing orientation that would allow for a national standardization of orientation programs. Such guidelines would allow for the formation of a standardized, scientifically-based, nursing orientation program.

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APPENDICES

APPENDIX A

INVESTIGATIONAL REVIEW BOARD WAIVER

[Stephanie Larson](#) Tue, Apr 19, 2011 at 3:14 PM
<stephanie.larson3@msu.montana.edu>
Reply-To: stephanie.larson3@msu.montana.edu
To: cherylj@montana.edu
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Cheryl,

I am writing on the suggestion of my graduate project adviser, Dr. Christina Siefloff. I am currently working on my graduate thesis/project which consists of an integrative literature review of all articles related to nursing orientation and their individual effects on retention of staff. I hope, through completing this review, that I will be able to make recommendations on what types of orientation programs appear to offer the best odds of retaining staff. I would like to confirm that I do not require an IRB in order to move forward with my project. I appreciate your taking the time to address this issue. Please let me know if you have any questions.

Sincerely,
Stephanie Larson
Graduate Student
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 Wed, Apr 20, 2011 at 3:32 PM

Johnson, Cheryl
<cherylj@montana.edu>
To: "stephanie.larson3@msu.montana.edu" <stephanie.larson3@msu.montana.edu>
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Hi Stephanie:

I am not sure if I answered this e-mail so am responding now. If you are doing a literature review you do not have to have IRB approval.

Cheryl

APPENDIX B

EVALUATION MATRIX

Table 5. Evaluation Matrix.

Pub Year	Author(s)	Conceptual Framework	Orientation Type	Setting	Sample (n)/Population	Retention	Quality Score
Nov/Dec 2004	Almada, Carafoli, Flattery, French, & McNamara	Benner's Novice to Expert Theory	Preceptor Program	150-bed, Non-teaching Community Hospital in Eastern Massachusetts	*Convenience Sample n=40/New Graduate Nurses	Overall retention increased from 60% to 89%	89
Apr-2009	Anderson, Allen, Linden, & Gibbs	None	Interactive Nurse Residency	Healthcare system in the Midwest with 5 metropolitan hospitals	*Convenience Sample n=90/New Graduate Nurses	Overall retention increased from 86% to 90%, second year retention remained at 70%.	83
Dec 2001	Beecroft, Kunzman, & Krozek	None	RN Internship in Pediatrics Program	Children's Hospital in Los Angeles, CA	*Convenience Sample Experimental Group=50/New Graduate Nurses Control Group=45/New Graduate Nurses	Turnover for interns was 14%. Turnover for the control group was 36%.	94
Nov/Dec 2004	Cavanaugh & Huse	Caffarella's Program Model	NICU Orientation/Preceptor Program	Tufts-New England Medical Center in Boston	* Convenience Sample n=27/Novice NICU Nurses	93% 2 year retention rate	94

Table 5. Evaluation Matrix (continued).

Pub Year	Author(s)	Conceptual Framework	Orientation Type	Setting	Sample (n)/Population	Retention	Quality Score
2005	Collins & Thomas	None	Step-Down Nurse Internship Program (SNIP)	Christina Care Health System	*Application Process n=13/New Graduate Nurses	11/13 interns still employed after 2 years.	83
Mar-2005	Courney	Nursing Staff Development Concepts	Peri-operative Extern-Intern Program	St. Mary-Corwin Medical Center	n=9/New Graduate Nurses	6/9 interns still employed	83
Apr-2002	Crimlisk, McNulty, & Francione	None	Competency based orientation program	500-bed Inner City Hospital	n=39/New Graduate Nurses	82% remain at facility, 69% remain in float pool	94
Jan/Feb 2011	Friedman, Cooper, Click, & Fitzpatrick	Benner's Novice to Expert Theory	Critical Care Nurse Fellowship Program	Multi-hospital health system in Metropolitan New York	*Non-probability Convenience sample n=90/New Graduate Nurses	Retention increased from 53.3% to 78.3%	94
2010	Fox	None	RN Mentor Program	St. Francis Hospital & Health Centers	n=200/New Graduate Nurses	Reduced turnover from 32.0 to 10.3%.	94
Jan/Feb 2007	Gavlak	None	Centralized Graduate Nurse Orientation	Large Metropolitan Hospital	New Graduate Nurses	94% retention rate	61

Table 5. Evaluation Matrix (continued).

Pub Year	Author(s)	Conceptual Framework	Orientation Type	Setting	Sample (n)/Population	Retention	Quality Score
May/June 2008	Golden	Benner's Novice to Expert Theory	Preceptorship	Methodist Healthcare, Memphis Tennessee	Newly Hired Nurses	Decreased turnover of newly hired RNs from 64% to 13% and a system wide decrease in RN turnover from 30% to 8%.	67
Nov-2009	Gomes, Higgins, Butler, Farzaneh, & Secours	Maslow's Hierarchy	Staged Orientation Program	298-bed facility in urban Virginia	n=15/Novice ED nurses	50% of participants are still working at facility	67
2002	Greene & Puetzer	The Nursing Process	Nursing Mentorship Program	St. Joseph Regional Medical Center, WI	Newly Hired Nurses	Significant decrease in voluntary termination of novice staff. 5 nurses terminated who had less than 18 months of experience. This was a decrease from the previous year where 21 staff with less than 18 months experience had terminated employment.	67

Table 5. Evaluation Matrix (continued).

Pub Year	Author(s)	Conceptual Framework	Orientation Type	Setting	Sample (n)/Population	Retention	Quality Score
Jan/Feb 2007	Halfer	Benner's Novice to Expert Theory, Knowles' Adult Learning Principles	RN Internship	Children's Memorial Hospital in Chicago	New Graduate Nurses	Voluntary nursing turnover decreased from 29.5% to 12.3%	72
July/August 2008	Halfer, Graf, & Sullivan	None	Nurse Mentoring Program	Children's Memorial Hospital in Chicago	New Graduate Nurses	Decreased voluntary turnover rate from 20% to 12%	94
July/August 1989	Hamilton, Murray, Lindholm, & Myers	None	Mentoring Program	300-bed Midwestern, inner-city public teaching hospital	n=7/New Graduate Nurses	100% retention after a year of full time employment	83
Sept/Oct 2009	Harton, Borrelli, Knupp, Rogers, & West	None	Blend of traditional orientation with electronic medical record orientation	Mission Hospitals in Asheville, North Carolina	Newly Hired Nurses	Decreased voluntary turnover from 11.4% to 10.2%	67
March/April 2011	Hatler, Stoffers, Kelly, Redding, & Carr	Donabedian's Paradigm of Structure-Process-Outcome	Dedicated Transition Unit	21-bed medical/surgical unit in a large, urban hospital in Phoenix, AZ	n=30/New Graduate Nurses	Reported 94% retention after 6 months	94

Table 5. Evaluation Matrix (continued).

Pub Year	Author(s)	Conceptual Framework	Orientation Type	Setting	Sample (n)/Population	Retention	Quality Score
Jan-2009	Klein	None	Floating Preceptor Program	Children's Healthcare of Atlanta	New Graduate Nurses	Improvement of retention from 80.2% to 82.1%.	72
Pub Year	Author(s)	Conceptual Framework	Orientation Type	Setting	Sample (n)/Population	Retention	Quality Score
2010	Kooker & Kamikawa	None	New Nurse Fellowship and Clinical Coach Program	The Queen's Medical Center in urban Honolulu, HI	New Graduate Nurses	Retention increased from 55.97% to 68.20%	89
May/June 2004	Marcum & West	Benner's Novice to Expert Theory	Structured Orientation Program	Sentara Leigh Hospital, Norfolk, Virginia	n=22/New Graduate Nurses	Reported 89% retention after 18 months	89
July/August 1992	Mathews & Nunley	None	Combined classroom/clinical Orientation	Foster G McGaw Hospital	Newly Hired Nurses	Reported decrease in turnover from 53% to 17% after 6 months	83
2011	Messmer, Bragg, & Williams	None	Support Group Program for New Graduate Nurses	Miami Children's Hospital	New Graduate Nurses in Pediatric Nursing	Reported a steady decrease in turnover from 2006 to 2009	94
May-2009	Morris, Pfifer, Catalano, Fortney, Nelson, Rabito, & Harap	Benner's Novice to Expert Theory	Orientation Pathways	Northwestern Memorial Hospital	Newly Hired Critical Care Nurses	Overall retention rate unchanged 2 years after implementation.	94

Table 5. Evaluation Matrix (continued).

Pub Year	Author(s)	Conceptual Framework	Orientation Type	Setting	Sample (n)/Population	Retention	Quality Score
Mar-1996	Revis, Thompson, Williams, Bezanson, & Cook	Knowles' Adult Learning Theory	Orientation Process utilizing continuous quality improvement	Georgia Baptist Medical Center	* Convenience Sample New Graduate Nurses	Decrease of turnover rate from 16.5% to 3.3% after one year.	83
2002	Speers	None	Registered Nurse Internship Program	William Beaumont Hospital	Novice Operating Room Nurses	Reported 91% retention (10 of 11 nurses) hired with the program.	78
2002	Squires	None	New Graduate Orientation Program for Rural Facilities	Yale-New Haven Hospital, New Haven Connecticut	New Graduate Nurses	Improved retention rates from 30% to 77% at one year.	78
Jan-2011	Woodward, Kelly, & Gifford	None	RN Residency Program	Virginia Mason Medical Center	New Graduate Nurses	Decreased turnover from 47% to 12% in 9 months.	87

APPENDIX C

CODING SCHEME

Codes for Orientation Components

- A. New Graduate Nurse
- B. Experienced Nurse
- C. Specialty Care
- D. Preceptorship
- E. Residency
- F. Internship
- G. Mentorship
- H. Programs \leq 6 months
- I. Programs \leq 3 months
- J. Programs \leq 9 months
- K. Programs \geq 1 year
- L. Added compensation for preceptors/mentors
- M. Classroom Component
- N. Preceptor Training
- O. Simulation
- P. Career Planning
- Q. Application Process for participants
- R. Externship

APPENDIX D

RESULTS MATRIX

Table 6. Results Matrix.

Study Authors, Year	Orientation Components Identified
Almada, Carafoli, Flattery, French, & McNamara, November/December 2004	A,D,F,H,M,N
Anderson, Allen, Linden, & Gibbs, April 2009	A,D,E,G,K,M,O,P
Beecroft, Kunzman, & Krozek, December 2001	A,C,D,F,G,H,M
Cavanaugh & Huse, November/December 2004	B,C,D,K,M,N
Collins & Thomas, 2005	A,D,H,M,Q
Courney, March 2005	A,C,D,K,M,Q,R
Craven, August 2002	A,D,K,M
Crimlisk, McNulty, & Francione, April 2002	A,D,F,H,M,Q
Friedman, Cooper, Click, & Fitzpatrick, January-February 2011	A,C,D,F,K,M,O
Fox, 2010	A,G,K,L
Gavlak, January/February 2007	A,G,I,M
Golden, May/June 2008	D,L,N
Gomes, Higgins, Butler, Farzaneh, & Secours, November 2009	D,G,M,N
Greene & Puetzer, 2002	A,B,G,K,M
Halfer, January/February 2007	A,C,F,G,K,M,N,Q
Halfer, Graf, & Sullivan, July-August, 2008	A,C,G
Hamilton, Murray, Lindholm, & Myers, July/August 1989	A,G,K,M
Harton, Borrelli, Knupp, Rogers, & West, September/October 2009	M,D
Hatler, Stoffers, Kelly, Redding, & Carr	A,D,I,M,N,O
Klein, January 2009	A,D,K,N
Kooker & Kamikawa, 2010	A, F,G,H

Table 6. Results Matrix (continued).

Study Authors, Year	Orientation Components Identified
Marcum & West, May;/June 2004	A,D,G,K,L,M,N
Martin, January-February 1989	C,D,F,L,N
Mathews & Nunley, July/August 1992	D,I,M
Messmer, Bragg, & Williams, 2011	A,C,M
Morris, Pfifer, Catalano, Fortney, Nelson, Rabito, & Harap, May 2009	C,D,M,O
Revis, Thompson, Williams, Bezanson, & Cook, March 1996	A,C,D,F,M,N
Speers, May/June 2002	B,C,D,F,H,M,N,Q
Squires, September/October, 2002	A,D,I,M,N,O
Woodward, Kelly, & Gifford, January 2011	A,B,D,E

APPENDIX E

CHECKLIST FOR ASSESSING QUALITY OF QUANTITATIVE STUDIES

Definitions and Instructions for Quality Assessment Scoring

How to calculate the summary score

Total sum = (number of “yes” * 2) + (number of “partials” * 1)

Total possible sum = 28 – (number of “N/A” * 2)

Summary score: total sum / total possible sum

Quality assessment

1. Question or objective sufficiently described?

Yes: Is easily identified in the introductory section (or first paragraph of methods section). Specifies (where applicable, depending on study design) *all* of the following: purpose, subjects/target population, and the *specific* intervention(s) /association(s)/descriptive parameter(s) under investigation. A study purpose that only becomes apparent after studying other parts of the paper is *not* considered sufficiently described.

Partial: Vaguely/incompletely reported (e.g. “describe the effect of” or “examine the role of” or “assess opinion on many issues” or “explore the general attitudes”...); *or* some information has to be gathered from parts of the paper other than the introduction/background/objective section.

No: Question or objective is not reported, or is incomprehensible.

N/A: Should not be checked for this question.

2. Design evident and appropriate to answer study question?

Yes: Design is easily identified and is appropriate to address the study question / objective.

Partial: Design and /or study question not clearly identified, but gross inappropriateness is not evident; *or* design is easily identified but only partially addresses the study question.

No: Design used does not answer study question (e.g., a comparison group is required to answer the study question, but none was used); *or* design cannot be identified.

N/A: Should not be checked for this question.

3. Method of subject selection (and comparison group selection, if applicable) or source of information/input variables (e.g., for decision analysis) is described and appropriate.

Yes: Described and appropriate. Selection strategy *designed* (i.e., consider sampling frame and strategy) to obtain an unbiased sample of the relevant target population or the entire target population of interest (e.g., consecutive patients for clinical trials, population-based random sample for case-control studies or surveys). Where applicable, inclusion/exclusion criteria are described and defined (e.g., “cancer” -- ICD code or equivalent should be provided). *Studies of volunteers:* methods and setting of recruitment reported. *Surveys:* sampling frame/strategy clearly described and appropriate.

Partial: Selection methods (and inclusion/exclusion criteria, where applicable) are not completely described, but no obvious inappropriateness. Or selection strategy is not ideal (i.e., likely introduced bias) but did not likely seriously distort the results (e.g., telephone survey sampled from listed phone numbers only; hospital based case-control study identified all cases admitted during the study period, but recruited controls admitted during the day/evening only). Any study describing participants only as “volunteers” or “healthy volunteers”.

Surveys: target population mentioned but sampling strategy unclear.

No: No information provided. Or obviously inappropriate selection procedures (e.g., inappropriate comparison group if intervention in women is compared to intervention in men). Or presence of selection bias which likely seriously distorted the results (e.g., obvious selection on “exposure” in a case-control study).

N/A: Descriptive case series/reports.

4. Subject (and comparison group, if applicable) characteristics or input variables/information (e.g., for decision analyses) sufficiently described?

Yes: Sufficient relevant baseline/demographic information clearly characterizing the participants is provided (or reference to previously published baseline data is provided). Where applicable, reproducible criteria used to describe/categorize the participants are clearly defined (e.g., ever-smokers, depression scores, systolic blood pressure > 140). If “healthy volunteers” are used, age and sex must be reported (at minimum). *Decision analyses:* baseline estimates for input variables are clearly specified.

Partial: Poorly defined criteria (e.g. “hypertension”, “healthy volunteers”, “smoking”). Or incomplete relevant baseline / demographic information (e.g., information on likely confounders not reported). *Decision analyses:* incomplete reporting of baseline estimates for input variables.

No: No baseline / demographic information provided.

Decision analyses: baseline estimates of input variables not given.

N/A: Should not be checked for this question.

5. If random allocation to treatment group was possible, is it described?

Yes: True randomization done - requires a description of the method used (e.g., use of random numbers).

Partial: Randomization mentioned, but method is not (i.e. it may have been possible that randomization was not true).

No: Random allocation not mentioned although it would have been feasible and appropriate (and was possibly done).

N/A: Observational analytic studies. Uncontrolled experimental studies. Surveys. Descriptive case series / reports. Decision analyses.

6. If interventional and blinding of investigators to intervention was possible, is it reported?

Yes: Blinding reported.

Partial: Blinding reported but it is not clear who was blinded.

No: Blinding would have been possible (and was possibly done) but is not reported.

N/A: Observational analytic studies. Uncontrolled experimental studies. Surveys. Descriptive case series / reports. Decision analyses.

7. If interventional and blinding of subjects to intervention was possible, is it reported?

Yes: Blinding reported.

Partial: Blinding reported but it is not clear who was blinded.

No: Blinding would have been possible (and was possibly done) but is not reported.

N/A: Observational studies. Uncontrolled experimental studies. Surveys. Descriptive case series / reports.

8. Outcome and (if applicable) exposure measure(s) well defined and robust to measurement / misclassification bias?

Means of assessment reported?

Yes: Defined (or reference to complete definitions is provided) and measured according to reproducible, “objective” criteria (e.g., death, test completion – yes/no, clinical scores). Little or minimal potential for measurement / misclassification errors. *Surveys:* clear description (or reference to clear description) of questionnaire/interview content and response options.

Decision analyses: sources of uncertainty are defined for all input variables.

Partial: Definition of measures leaves room for subjectivity, *or* not sure (i.e., not reported in detail, but probably acceptable). *Or* precise definition(s) are missing, but no evidence or problems in the paper that would lead one to assume major problems. *Or* instrument/mode of assessment(s) not reported. *Or* misclassification errors may have occurred, but they did not likely seriously distort the results (e.g., slight difficulty with recall of long-ago events; exposure is measured only at baseline in a long cohort study). *Surveys:* description of questionnaire/interview content incomplete; response options unclear. *Decision analyses:* sources of uncertainty are defined only for some input variables.

No: Measures not defined, or are inconsistent throughout the paper. *Or* measures employ only ill-defined, subjective assessments, e.g. “anxiety” or “pain.” *Or* obvious misclassification errors/measurement bias likely seriously distorted the results (e.g., a prospective cohort relies on self-reported outcomes among the “unexposed” but requires clinical assessment of the “exposed”). *Surveys:* no description of questionnaire/interview content or response options. *Decision analyses:* sources of uncertainty are not defined for input variables.

N/A: Descriptive case series / reports.

9. Sample size appropriate?

Yes: Seems reasonable with respect to the outcome under study and the study design. When statistically significant results are achieved for major outcomes, appropriate sample size can usually be assumed, unless large standard errors ($SE > 1/2$ effect size) and/or problems with multiple testing are evident. *Decision analyses:* size of modeled cohort / number of iterations specified and justified.

Partial: Insufficient data to assess sample size (e.g., sample seems “small” and there is no mention of power/sample size/effect size of interest and/or variance estimates aren’t provided). *Or* some statistically significant results with standard errors $> 1/2$ effect size (i.e., imprecise results). *Or* some statistically significant results in the absence of variance estimates. *Decision analyses:* incomplete description or justification of size of modeled cohort / number of iterations.

No: Obviously inadequate (e.g., statistically non-significant results and standard errors $> 1/2$ effect size; or standard deviations $> _$ of effect size; or statistically non-significant results with no variance estimates and obviously inadequate sample size). *Decision analyses:* size of modeled cohort / number of iterations not specified.

N/A: Most surveys (except surveys comparing responses between groups or change over time). Descriptive case series / reports.

10. Analysis described and appropriate?

Yes: Analytic methods are described (e.g. “chi square”/ “t-tests”/“Kaplan-Meier with log rank tests”, etc.) and appropriate.

Partial: Analytic methods are not reported and have to be guessed at, but are probably appropriate. *Or* minor flaws or some tests appropriate, some not (e.g., parametric tests used, but unsure whether appropriate; control group exists but is not used for statistical analysis). *Or* multiple testing problems not addressed.

No: Analysis methods not described and cannot be determined. *Or* obviously inappropriate analysis methods (e.g., chi-square tests for continuous data, SE given where normality is highly unlikely, etc.). *Or* a study with a descriptive goal / objective is over-analyzed.

N/A: Descriptive case series / reports.

11. Some estimate of variance (e.g., confidence intervals, standard errors) is reported for the main results/outcomes (i.e., those directly addressing the study question/objective upon which the conclusions are based)?

Yes: Appropriate variances estimate(s) is/are provided (e.g., range, distribution, confidence intervals, etc.). *Decision analyses:* sensitivity analysis includes all variables in the model.

Partial: Undefined “+/-“ expressions. *Or* no specific data given, but insufficient power acknowledged as a problem. *Or* variance estimates not provided for all main results/outcomes. *Or* inappropriate variance estimates (e.g., a study examining change over time provides a variance around the parameter of interest at “time 1” or “time 2”, but does not provide an estimate of the

variance around the difference). *Decision analyses*: sensitivity analysis is limited, including only some variables in the model.

No: No information regarding uncertainty of the estimates. *Decision analyses*: No sensitivity analysis.

N/A: Descriptive case series / reports. Descriptive surveys collecting information using open-ended questions.

12. Controlled for confounding?

Yes: Randomized study, with comparability of baseline characteristics reported (or non-comparability controlled for in the analysis). *Or* appropriate control at the design or analysis stage (e.g., matching, subgroup analysis, multivariate models, etc). *Decision analyses*: dependencies between variables fully accounted for (e.g., joint variables are considered).

Partial: Incomplete control of confounding. *Or* control of confounding reportedly done but not completely described. *Or* randomized study without report of comparability of baseline characteristics. *Or* confounding not considered, but not likely to have seriously distorted the results. *Decision analyses*: incomplete consideration of dependencies between variables.

No: Confounding not considered, and may have seriously distorted the results. *Decision analyses*: dependencies between variables not considered.

N/A: Cross-sectional surveys of a single group (i.e., surveys examining change over time or surveys comparing different groups should address the potential for confounding). Descriptive studies. Studies explicitly stating the analysis is strictly descriptive/exploratory in nature.

13. Results reported in sufficient detail?

Yes: Results include major outcomes and all mentioned secondary outcomes.

Partial: Quantitative results reported only for some outcomes. *Or* difficult to assess as study question/objective not fully described (and is not made clear in the methods section), but results seem appropriate.

No: Quantitative results are reported for a subsample only, or “n” changes continually across the denominator (e.g., reported proportions do not account for the entire study sample, but are reported only for those with complete data -- i.e., the category of “unknown” is not used where needed). *Or* results for some major or mentioned secondary outcomes are only qualitatively reported when quantitative reporting would have been possible (e.g., results include vague comments such as “more likely” without quantitative report of actual numbers).

N/A: Should not be checked for this question.

14. Do the results support the conclusions?

Yes: All the conclusions are supported by the data (even if analysis was inappropriate). Conclusions are based on all results relevant to the study question, negative as well as positive ones (e.g., they aren’t based on the sole

significant finding while ignoring the negative results). Part of the conclusions may expand beyond the results, if made *in addition to* rather than instead of those strictly supported by data, and if including indicators of their interpretative nature (e.g., “suggesting,” “possibly”).

Partial: Some of the major conclusions are supported by the data, some are not. *Or* speculative interpretations are not indicated as such. *Or* low (or unreported) response rates call into question the validity of generalizing the results to the target population of interest (i.e., the population defined by the sampling frame/strategy).

No: None or a very small minority of the major conclusions are supported by the data. *Or* negative findings clearly due to low power are reported as definitive evidence against the alternate hypothesis. *Or* conclusions are missing. *Or* extremely low response rates invalidate generalizing the results to the target population of interest (i.e., the population defined by the sampling frame/strategy).

N/A: Should not be checked for this question.