JNPD Journal for Nurses in Professional Development • Volume 31, Number 6, 312–323 • Copyright © 2015 Wolters Kluwer Health, Inc. All rights reserved.

A Systematic Review on Interventions Supporting Preceptor Development

CE 2.0 ANCC Contact Hours

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Increases in newly licensed nurses and experienced nurses changing specialties create a challenge for nursing professional development specialists (NPDS). The NPDS must use the best available evidence in designing programs. A systematic review of interventions for developing preceptors is needed to inform the NPDS in best practice. A search was conducted for full-text, quantitative, and mixed-methods articles published after the year 2000. Over 4000 titles were initially identified, which yielded 12 research studies for evaluation and syntheses. Results identified a limited body of evidence reflecting a need for NPDS to increase efforts in measuring the effectiveness of preceptor development initiatives.
(See CE Video, Supplemental Digital Content 1, http://links.lww.com/JNPD/A9)

Building a comprehensive nurse preceptor development program is essential for acute care systems in today's healthcare environment. Acute care organizations are challenged with an overwhelming number of nursing students obtaining clinical practice hours, newly licensed nurses entering the profession, and experienced nurses seeking opportunities in new practice specialties (Auerbach, Buerhaus, & Staiger, 2011). Meeting the psychosocial and developmental needs of these nurses transitioning into new roles falls to the nursing professional development specialist (NPDS). The NPDS serves a vital role in the creation of preceptor development programs and relies on best practices as identified in the literature (American Nurses Association & National Nursing Staffing Development Organization, 2010). Prepared preceptors can also lead to nurses' improved satisfaction and improved retention rates (Lee, Tzeng, Lin, & Yeh, 2009; Sandau, Cheng, Pan, Gaillard, & Hammer, 2011).

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Source of funding: was a research grant from the Association for Nursing Professional Development.

The authors have disclosed that they have no significant relationship with, or financial interest in, any commercial companies pertaining to this article.

Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's Web site (www.jnpdonline.com).

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DOI: 10.1097/NND.0000000000000195

BACKGROUND AND SIGNIFICANCE

Nursing Turnover and Replacement

The NPDS must keep informed of nursing workforce trends, such as turnover rates, projected shortages, and changing demographics, and their implications when planning preceptor development interventions. The turnover rate of new nurses has been reported anywhere between 35% and 61% during the first year of practice (Anderson, Linden, Allen, & Gibbs, 2009; Beecroft, Kunsman, & Krozek, 2001). Moreover, the cost of replacing one nurse is at least $44,000, with one study estimating up to $67,100 (Halfer, Graf, & Sullivan, 2008; Jones, 2005). Estimates that account for inflation and are more practical, are probably closer to $82,000 if vacancies are filled with experienced nurses (Jones, 2008).

Surge of New Nurses

Federal and state legislators have worked to address concerns over the nursing shortage for years. It has been reported that 850,000 nurses in the United States are between 50 and 64 years old (Buerhaus, Auerbach, Staiger, & Muench, 2013). The 2004 National Sample Survey of Registered Nurses reported that over 55% of nurses intend to retire between 2011 and 2020, and as a result, new nursing programs have appeared throughout the country, and postsecondary schools have expanded their programs (Dracup & Morris, 2007). This surge of new nurses is predicted to swell toward the end of this decade, and it will dramatically increase between 2020 and 2030 (Auerbach et al., 2011). These trends point toward an overwhelming

need for prepared nursing preceptors to assist with the transitioning of nurses into the workforce.

Identified Gap in the Literature

The literature is abundant with interventional research studies attesting to the successful outcomes related to the development of preceptors. Billay and Myrick (2007) completed an integrative review summarizing how allied health disciplines describe preceptorship; however, the study did not address preceptor development. Mann-Salinas et al.'s (2014) systematic review on evidenced-based preceptor programs found a paucity of evidence-based strategies to support preceptor development. The authors' review excluded studies including preceptors of students (Mann-Salinas et al., 2014). This identified gap in the literature is a challenge for the NPDS, who is tasked with gathering the evidence available to provide for the developmental needs of both students and staff requiring preceptor support during role transition.

Preceptor Development

Preceptor development is one intervention that the NPDS uses to address the development needs of those entering new roles within the acute care organization. Luhanga, Dickieson, and Mossey (2010) state that the success of the orientation to the environment is dependent on the proper preparation of the preceptor as supported by a formalized educational program. When Billay and Myrick (2007) conducted their integrative review on allied health preceptorship, education of the nursing preceptor was a prominent theme in the literature. The need for the creation of preceptor development programs is profuse in the nursing literature (Almada, Carafoli, Flattery, French, & McNamara, 2004; Luhanga et al., 2010). Moreover, one study reported that 49% of preceptors did not feel they were adequately prepared for the role of preceptor (Yonge, Hagler, Cox, & Drefs, 2008).

PURPOSE OF THE STUDY

A formalized systematic review is essential to help the NPDS evaluate best practices for preceptor development programs. Levels of evidence reside on a hierarchy with systematic reviews ranking the highest (Bettany-Saltikov, 2012). The purpose of this study was to review, assess, analyze, and synthesize the best available evidence of interventions that support preceptor development to inform the NPDS practice.

SYSTEMATIC REVIEW METHODOLOGY

Study Design

A systematic review was conducted, guided by processes recommended by the Evidence Based Practice Centers funded by the Agency for Healthcare Research and Quality (2014). Processes were developed to identify and select relevant articles, review and rate the individual articles, and then synthesize results and grade the evidence. No meta-analysis was planned as considerable heterogeneity across articles was anticipated with regard to participant samples, definitions of outcomes, length of follow-up, and settings.

Literature Search and Eligibility

A literature search was conducted as recommended by the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement* (Moher, Liberati, Tetzlaff, Altman, & PRISMA Group, 2009). Study eligibility criteria were established a priori. Inclusion criteria were primary studies with nursing preceptors of students, new graduates, or nurses changing specialties; full text; published; peer reviewed; and English language originating from any country. Quantitative studies about nursing preceptor development were included if the settings were acute care hospital or inpatient rehabilitation, and reported at least one intervention and one measurable outcome. Excluded studies were unpublished dissertations and those studies focused on preceptors of advanced practice nurses.

Search strategies were adapted from Cochrane and the National Institute for Health and Clinical Excellence protocols to systematically search Pubmed, CINAHL (EBSCOHost), Dissertations & Theses (Proquest), ERIC, Scopus, and Cochrane Libraries of Systematic Reviews and Clinical Trials (OVID) databases from 2000 through March 2014 (Chandler, Churchill, Higgins, Lasserson, & Tovey, 2013). The searches were designed for high sensitivity to locate any study of preceptor development. The search was limited to articles published between January 2000 and March 2014 to capture a timely body of research that is consistent with the findings of Billay and Myrick (2007), who reported that most articles pertaining to education of nursing preceptors were published after 2000. Search selection strategies were conducted in a stepwise fashion with a team of five reviewers: Two reviewers independently examined all titles for inclusion criteria. Consensus was reached, and abstracts were reviewed independently by two reviewers. Consensus was reached, and the full-text articles were randomly assigned and examined by two reviewers. Bibliographies of full-text articles were searched to locate additional articles, and 94 were found (see Figure 1).

Data Extraction

Data were divided among the research team. Each section of data was extracted by two reviewers with both clinical and methodological expertise. Detailed evidence tables were completed from the data extraction performed. Data were rechecked against the original articles for accuracy. If discrepancies were discovered, these were discussed by the team, resolved, and corrected.

Quality Assessment Tools

Medical education research study quality instrument

The Medical Education Research Study Quality Instrument (MERSQI) and Best Evidence in Medical Education (BEME) were used to rate study quality and were selected because of

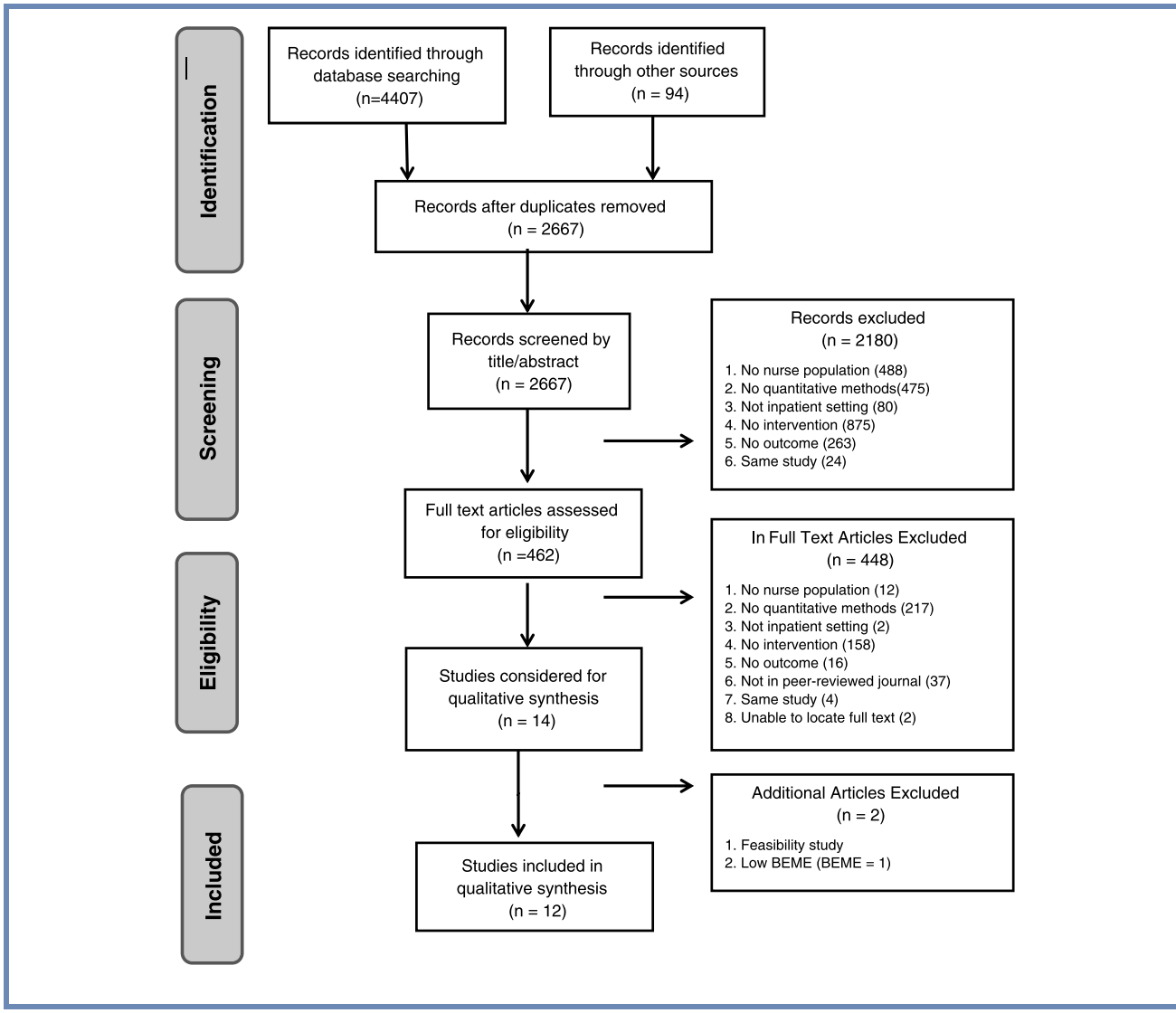

FIGURE 1 Flow diagram: review of records for interventions to support preceptor development.

their frequent use in quality assessment of medical and nursing education (Cook, Levinson, & Garside, 2011; Reed et al., 2008; Sullivan, 2011; Yucha, Schneider, Smyer, Kowalski, & Stowers, 2011). The MERSQI contains 10 items that rate study quality in six domains of research quality: study design, sampling, type of data (subjective or objective), validity, data analysis, and outcomes (Reed et al., 2008). The maximum score for each domain is 3 with a maximum MERSQI score of 18. The potential range is 5–18. Domain scores that had a "not applicable response" option were adjusted to the percent of total achievable points for that domain to allow for total scale scoring (Reed et al., 2008). MERSQI has been found to have strong content validity, interrater reliability (r = .72–.998), and internal consistency reliability (α = .57–.92) and adequate predictive validity and criterion validity compared with other variables, such as published versus rejected manuscripts (Cook et al., 2011; Reed et al., 2007, 2008; Yucha et al., 2011). Internal consistency of the MERSQI in nursing education is supported (α = .55; Yucha et al., 2011).

Best evidence in medical education

The BEME global scale assesses two domains, the strength of the evidence (range = 1–5, 1 = *no clear conclusions can be drawn* to 5 = *results are unequivocal*) and outcomes based on the Kirkpatrick's levels of educational outcomes (see Table 1; Hammick, Dornan, & Steinert, 2010; Littlewood et al., 2005). Limited validity and reliability evidence for the BEME was located in the literature. However, positive correlations have been found between the MERSQI and BEME instruments (r = .58–.62; Cook et al., 2011). Two reviewers independently rated the quality of each study with an agreement rate of 100%. The research team discussed but did not rank three additional items as recommended by Colthart et al. (2008): (a) the appropriateness of the design of the

TABLE 1 Descriptive Statistics for Quality Variables (n = 12)

MERSQI score	
Mean (*SD*)	11.38 (2.21)
Median (range)	11 (7–15)
BEME strength of evidence score	
Mean (*SD*)	3.08 (0.67)
Median (range)	3 (2–4)
BEME outcome score	
1: Participation	(0)
2a: Attitudes or perceptions	25.0% (3)
2b: Knowledge and skills	41.7% (5)
3: Behavioral change	16.7% (2)
4a: Organizational practice	8.3% (1)
4b: Patient benefits	8.3% (1)

BEME = Best Evidence in Medical Education; MERSQI = Medical Education Research Study Quality Instrument.

study to answer the research questions posed, (b) how well the design was implemented, and (b) the appropriateness of the analysis with elaboration on any concerns.

RESULTS OF THE STUDY

Four thousand five hundred one articles were identified through database searching and other sources. Twelve articles were selected for qualitative synthesis (see Figure 1). The 12 interventional research articles that were selected for quality review are summarized in Table 2. Ten of the research articles were quasi-experimental, and two were of experimental design. Seven of the articles used a longitudinal design, and five used a cross-sectional design. In addition, 11 of the studies used a prospective design, whereas one used retrospective and prospective dimensions. In 6 of the 12 articles, researchers reported using a theoretical or conceptual model as a framework for their studies (see Table 2). Ten studies used the primary intervention of workshops, which may have included various instructional methodologies such as group discussion, role play, and/or printed materials (see Table 2). The two remaining studies used CD-ROM or a printed manual self-directed learning.

Content Topics

Study authors reported the inclusion of a variety of content topics as part of the preceptor development intervention (see Table 2). Content most frequently reported was giving and receiving feedback (83%), effective communication (75%), facilitating adult learning (58%), reviewing roles and responsibilities of the preceptor role (58%), and the development and evaluation of clinical judgment (50%). Contents such as evidenced-based practice, mentoring, time management, diversity, rewards and benefits, and motivation were reported infrequently, with inclusion in only one study each. There were many evaluation methods (dependent variables) used to determine effectiveness of the intervention (see Table 2). Dependent variables as reported by the study authors ranged from low-level participant satisfaction measures to high-level patient safety quality indicators, such as decreases in medication errors, patient falls, and incidents.

Quality Assessment Scores

MERSQI and BEME scores were calculated based on the rigor of the research design and the level of outcomes reported (see Table 3). The range of MERSQI scores was 7–15, with a mean of 11.38 (*SD* = 2.21; see Table 1). The range of BEME strength scores for the 12 articles was 2–4, with a mean of 3.08 (*SD* = 0.67). The BEME outcome scores were predominately lower level outcomes (25.0% 2a-Attitudes or perceptions, 41.7% 2b-Knowledge and skills, 16.7% 3-behavioral change, 8.3% 4a-organization practice, 8.3% 4b-patient benefits). A correlation between both tools' strength scores showed a positive but weak correlation (r = .13) and was not statistically significant ($p > .05$).

Methodological Concerns

After addressing the three additional discussion questions, as recommended by Colthart et al. (2008), the research team identified methodological concerns. Two of the 12 studies were found to use an inappropriate design for the study question. One study used a posttest-only design, and another study used a dependent variable (evaluation) that was inconsistent with the research questions. Seven of the studies (58.3%) had a design that was not well implemented. Some examples of concern were high attrition rates, small sample sizes, and/or lack of fidelity to administer the intervention reliably. Additional concerns ranged from unreported validity of the instrumentation to a risk of a Type 1 error from lack of control for t test pretest scores. Six of the studies (50%) reported an appropriate analysis for their study. The discussion also identified strength in the diversity of interventions, sample selections, and design analysis.

DISCUSSION

This systematic review provided a rigorous analysis of the current state of evidence pertaining to preceptor development. Most studies reported success with a variety of instructional strategies, many of which were offered during workshops. Multiple creative modalities were implemented, such as the use of CD-ROM, learner-directed modules, and resources.

TABLE 2 Description of the Articles Selected for Qualitative Analysis

Article	Research Question	Theoretical Framework	Independent Variable(s)	Dependent Variable (or Outcome)	Sample Size and Setting	Results	Nursing Specialty	Population
Al-Hussami, Saleh, Darawad, and Alramly (2011)	Nurses who complete a preceptor training program will show increased knowledge of the concepts and skills of preceptorship compared with the control group. Gender, years of clinical experience, and level of education will affect knowledge levels for both the experimental and control groups.	King's theory of goal attainment	Preceptors attended class where seven modules were presented by lecture, group discussion, and printed materials.	Increased preceptor knowledge as measured by the Knowledge Assessment Index	$n = 68$, preceptors; four hospitals identified as governmental, teaching, and private in Jordan	The experimental group had significantly higher knowledge scores after implementation of the preceptor training program as compared with the control group ($p < .001$). The experimental group had significant higher scores on the posttest ($p < .001$) as compared with the pretest. Analysis of covariance results showed no difference in performance related to demographics such as age, years of experience in nursing, and as a preceptor ($p > .05$).	Not identified	Not specified
Bradley et al. (2007)	What impact does the blended learning approach have on (a) learner satisfaction with the educational experience, (b) learner preparation in the classroom setting, and (c) instructor satisfaction with teaching in the classroom setting?	Not reported	Five self-paced Web-based training and instructor-led sessions	Learner satisfaction, instructor perceptions of learner preparation and participation, instructor satisfaction	$n = 120$ preceptors, $n = 16$ instructor faculty, six pediatric hospitals	High impact reported by preceptors: online content prepared them for classroom activities (91%), classroom activities reinforced concept learned in the Web-based training (96%), improved knowledge related to the role (94%), understood strategies for providing and receiving feedback (93%). Moderate impact reported by instructor faculty: changed the way they taught the live course (56%), strongly agreed that online course provided the opportunity to use active learning strategies in the live classes (53%), increased satisfaction in teaching the material (53%).	92% pediatric nurses, 8% RT, rehabilitation specialists and laboratory techs	Only identified as new employees
Hagler et al. (2012)	Does instruction in evidence-based practice (EBP) methods increase knowledge and endorsement of EBP among preceptors?	Not reported	Eight half-day workshops taught by academic experts in EBP	EBP Beliefs scale, increased interest in EBP, seeking further education/ training in EBP, increased use of EBP	$n = 160$ preceptors, six diverse hospitals in Arizona (56–450 beds; six nonprofit, one teaching, two federal, two specialty hospitals)	Statistically significant improvement on the EBP Beliefs Scale after intervention ($p < .001$). In the end of study survey, 62% reported an increased interest in EBP, 43% reported seeking additional education in EBP, and 52% reported an increase in their use of EBP	Not identified	Student nurses

Continued

TABLE 2 Description of the Articles Selected for Qualitative Analysis, Continued

Article	Research Question	Theoretical Framework	Independent Variable(s)	Dependent Variable (or Outcome)	Sample Size and Setting	Results	Nursing Specialty	Population
Hallin and Danielson (2009)	To what extent do preceptors in 2000 (preimplementation) and 2006 (postimplementation) differ concerning: Preceptor preparation? Support from teachers, colleagues, chief nurses, and enrolled nurses? What relationships exist between preceptors' experiences of preceptoring and their personal and clinical characteristics?	Andersson-Thorell, Westlund, and Athlin's Preceptor Model	Preceptor model, preceptor workshops, planning/evaluation of meetings, personal support of the preceptor, guidelines for preceptor reflective and self-learning activities, worksheets for feedback and evaluation of students, and preceptee goal setting	Perceived experiences of preceptor preparation and perceived experiences of preceptor support	$n = 113$ preceptors (preintervention), $n = 109$ preceptors (postintervention), county hospital in Sweden	Significant improvement in preceptors' experiences between 2000 and 2006 ($p > .05$) in seven of the nine variables studied. Significantly more preceptors in 2006 reported that they were prepared for the role and had support from instructors, peers, chief nurses, and students ($p < .05$). A strong positive relationship was found in preceptors' experiences in the role and level of interest in future preceptoring ($r = .21–.071$, $p = .03$ to $<.001$). Other correlations found among personal and clinical characteristics.	Medical infection care, orthopedic surgical, gynecological care, emergency and pediatric care	Student nurses
Horton, DePaoli, Hertach, and Bower (2012)	Did the preceptors feel better prepared to precept after attending the Nurse Preceptor Academy?	Watson's Theory of Human Caring	Nurse Preceptor Academy day (8-hour) workshop that included assessing learning needs, communication constructive feedback, conflict resolution, completion of Myers–Briggs Type Indicator® assessment to increase awareness of individual differences and behaviors	Preceptor preparation, course content being used in practice, preceptor satisfaction, and support	$n = 714$ preceptors, 18 Kansas City Metropolitan hospitals	Preceptor preparation: 4.46 on a 5-point Likert scale (1= *no*, 2= *probably not*, 3 = *undecided*, 4 *probably*, 5 = *yes*). Course content usage 3–9 months after attending workshop: 65% used setting weekly goals; 49% used Myers–Briggs personality type® and self-awareness information; 46% used weekly evaluations; 44% used preceptee's evaluation of preceptor performance; 41% used critical thinking questions; 33% used final meetings with preceptee, manager, and/or educator; 26% celebrated at the end of orientation; 25% used novice-to-expert model; 15% used concept mapping; 9% used graduation for new graduate nurses Perceived support: from co-workers = 4.13, from manager and educators = 4.20 (1 = *definitely not* to 5 =*all of the time*). Preceptor satisfaction with their role = 4.17 and level of being happy as preceptor = 4.18 based on a 5-point Likert scale (1 = *very low*, 5 = *very high*).	Not identified	Newly licensed nurses

Continued

TABLE 2 Description of the Articles Selected for Qualitative Analysis, Continued

Article	Research Question	Theoretical Framework	Independent Variable(s)	Dependent Variable (or Outcome)	Sample Size and Setting	Results	Nursing Specialty	Population
Komaratat and Oumtanee (2009)	Will new graduate nurses' competency increase after the implementation of the nurse mentorship model? Will a manual of mentorship increase preceptor knowledge?	Morton–Coopers and Plamer's Model of Mentorship Process, and Taechaveerakorn and Oumtanee's Nurse Competency Concepts	Mentorship model: (a) preparation of preceptors via workshop and independent study of a manual of mentorship, (b) working with preceptee with assigned duties, (c) mentoring termination	Newly licensed nurse competency (Nursing Competency Scale), preceptor knowledge (Mentorship Knowledge Scale)	n = 19 newly licensed nurses; one hospital in Bangkok, Thailand	Newly graduated nurses' competency was significantly higher postexperiment than preexperiment ($p < .05$). Preceptor knowledge scores increased from 8.35 to 11.76 (maximum score = 15).	Not identified	Newly licensed nurses
Lee et al. (2009)	Will a preceptorship program affect (a) new nurse turnover rates; (b) turnover cost; (c) quality of nursing care; (d) satisfaction of preceptors' teaching; and (e) preceptor perceptions of rewards, benefits, support, and commitment?	Not reported	(a) A 9-hour preceptor training program with monthly seminars, (b) training manual with instructions for new staff	New nurse turnover rates; turnover costs; quality of nursing care (medication errors, fall rates, and patient satisfaction); satisfaction of preceptor's teaching; and preceptor perceptions of rewards, benefits, support, and commitment	n = 24 preceptors, n = 34 new nurses, 1800-bed teaching medical center in Taiwan	Turnover rates improved from 33.1% (preintervention, previous year) to 15.4% (postintervention) Decreased turnover cost saved $186,102 during a 6-month study period Medication error rates improved (previous year = 0.037 per 1000 patient days to 0.013 during study period); fall rates improved (previous year = 0.29 per 1000 patient days to 0.23 during study period); adverse event decreased (previous year = 0.30 per 1000 patient days to 0.24 during study period). Overall patient satisfaction did not significantly improve over previous year ($p > .05$). Subcategories of attitude of nursing staff, privacy of patients, tranquility on the ward, and feedback of questions to provider improved ($p < .05$). Satisfaction with preceptors was above satisfactory and positive, but not significant ($p > .05$).	Not identified	Student nurses

Continued

TABLE 2 Description of the Articles Selected for Qualitative Analysis, Continued

Article	Research Question	Theoretical Framework	Independent Variable(s)	Dependent Variable (or Outcome)	Sample Size and Setting	Results	Nursing Specialty	Population
						Preceptor perceptions of rewards, benefits, support, and commitment were described 2.85–3.15 on a 4-point Likert scale (higher score indicating greater understanding of benefits, rewards, support, and commitment).		
Parker, Lazenby, and Brown, (2012)	Is there an increase in perceived knowledge (of the preceptor) after viewing an instructional CD?	Not reported	A state-of-the-science CD-ROM instructional tool for the preceptor	Perceived knowledge, CD effectiveness and quality survey, telephone survey to assess if preceptors viewed CD and associated factors for not viewing, preference over Web-based option and/or notebook	n = 112 senior students/preceptor dyads recruited; however, few completed follow-up (final: n = 14–18 based on outcome measure; multiple small rural community hospitals and metropolitan medical centers, both teaching and research	The mean knowledge scores were not significant ($p > .05$). CD effectiveness/quality: positive feedback with quality (overall quality rating = good, $M = 4.5$; 1 = *strongly disagree*, 5 = *strongly agree*). The preceptors responded with the greatest agreement regarding the understandable content of the CD. The least agreement was for time required for viewing the CD. 72.2% of the preceptors stated they did not view the enclosed CD, 65% reported lack of time as a factor for not viewing the CD, and 50% indicated that a Web-based format could be a better option.	Multiple but not limed to labor/delivery, medical surgical, emergency, neonatal intensive care, bone marrow transplant	Student nurses
Riley-Doucet (2008)	Will a Preceptor Orientation Self-Learning Education module impact preceptor knowledge and satisfaction?	Not reported	Preceptor manual that included sections on introduction to the capstone senior nurse course, teaching strategies for the adult learner, effective preceptoring, coaching, feedback and evaluation	Preceptor knowledge of course objectives and satisfaction	n = 119 preceptors, various teaching hospitals in the Midwest	Knowledge: posttest knowledge scores, M = 90.13% (SD = 7.019%).	Not specified	Student nurses

Continued

TABLE 2 Description of the Articles Selected for Qualitative Analysis, Continued

Article	Research Question	Theoretical Framework	Independent Variable(s)	Dependent Variable (or Outcome)	Sample Size and Setting	Results	Nursing Specialty	Population
						Satisfaction: On a 5-point Likert scale (1= *strongly disagree*, 5 = *strongly agree*), preceptors reported satisfaction with the module ($M = 4.49$, $SD = 0.569$), high readability of the self-learning module ($M = 4.48$, $SD = 0.585$), satisfaction with the layout of the module ($M = 4.32$, $SD = 0.632$), and helpfulness ($M = 4.41$, $SD = 0.615$).		
Sandau et al. (2011)	What was the effect of an 8-hour preceptor education program on (a) preceptors' confidence and comfort in five specific preceptoring roles, (b) satisfaction and confidence among preceptees who had preceptors who completed the workshop, and (c) preceptee retention? Between Cohort 1 preceptors and Cohort 2 preceptors, was there a difference in comfort, confidence, and the five specific preceptor roles?	Benner's Novice to Expert	8-hour mandatory preceptor workshop	Preceptor's self-reported confidence and comfort in five specific roles, frequency of coaching critical thinking and providing formal feedback, preceptees' satisfaction and confidence, preceptees' retention rates were compared for 1-year pre/post workshop.	Cohort 1: past preceptors ($n = 74$) and past preceptees ($n = 39$), Cohort 2: preintervention ($n = 300$) preceptors and preintervention preceptees ($n = 53$), a large Midwest hospital, licensed for 926 beds	At 3–6 months, Cohort 1 preceptors reported improved satisfaction ($p > .05$) with their preceptor education in all five roles than they had before the workshop. Significant improvement in the f requency the preceptor worked with preceptees in the previous 3–6 months to actively coach critical thinking ($p < .001$), but no significant increase was noted in frequency of formal feedback ($p > .05$). Preceptees in Cohorts 1 and 2 showed no significant difference in satisfaction or confidence ($p > .05$). Retention rates for preceptees for 1 year before versus 1 year after the educational intervention were significantly greater 1-year postintervention ($p < .05$).	Not specified	Experienced nurses, same specialty, and experienced nurses changing specialty

Continued

TABLE 2 Description of the Articles Selected for Qualitative Analysis, Continued

Article	Research Question	Theoretical Framework	Independent Variable(s)	Dependent Variable (or Outcome)	Sample Size and Setting	Results	Nursing Specialty	Population
						Cohorts 1 and 2 preceptors had significantly higher satisfaction with education scores related to preceptoring ($p = .001$). No significant difference was found with comfort and confidence in the five preceptoring roles ($p > .05$). However, transfer nurses showed significantly higher scores in confidence on the completion of first assignment and confidence in the use of critical thinking ($p < .05$).		
Smedley, Morey, and Race (2010)	Will preceptors, after completing the course report, (a) increase knowledge of the teaching and learning process; (b) increase knowledge, understanding, and use of generic preceptor skills; (c) increase preceptor self-efficacy; and (d) positively change attitude toward student nurses?	Not reported	An accredited course in the master of nursing curriculum at a college. The blended course was provided over a semester and included both lecture and self-directed learning.	Preceptor Program Educational Outcomes (PPEO) scale. The subscales include preceptor knowledge of teaching and learning processed, generic preceptor skills, preceptor self-efficacy, and preceptor attitudes toward student nurses.	$n = 117$ preceptors, one healthcare facility in Australia	No significant difference was found in any of the PPEO subscales based on demographic variables (p not reported). Three regression models were identified that support various outcome measures and PPEO subscale and demographic variables: predictors of student preceptor self-efficacy (model accounted for 74.1% of variance, $p < .05$), predictors of change in preceptor attitude toward student nurse (model accounted for 54% of variance, $p < .05$), and predictors of change in generic preceptor skills (model accounted for 72.6% of variance, $p < .05$).	Not specified	Student nurses
Sorensen and Yankech (2008)	Can a research-based, theory-driven preceptor educational program improve the critical thinking scores of new graduate nurses?	Sorensen and Yankech's conceptual model	Research-based, theory-driven, preceptor 3-hour educational program	Critical thinking of new graduate nurses as measured by California Critical Thinking Skills Test (CCTST)	Control group: $n = 16$ new graduate nurses, experimental group: $n = 15$ new graduate nurses, 15 preceptors attended the educational program in a Midwestern not-for-profit hospital system	Significance ($p < .05$) was achieved in the evaluation subscale of the CCTST in the control and experimental groups. No statistical difference ($p > .05$) was found in the analysis and inference subscale and total scale scores.	Not specified	Newly licensed nurses

TABLE 3 Quality Assessment Summary for the Final Sample of Articles (n = 12)

Article	MERSQI Score	BEME Strength Score	BEME Highest Outcome Score
Al-Hussami et al. (2011)	14.0	4	2b
Bradley et al. (2007)	10	3	2a
Hagler et al. (2012)	11.5	4	3
Hallin and Danielson (2009)	10.5	3	2a
Horton et al. (2012)	7	3	3
Komaratat and Oumtanee (2009)	13	3	2b
Lee et al. (2009)	15	3	4b
Parker et al. (2012)	11.0	2	2b
Riley-Doucet (2008)	10.5	2	2b
Sandau et al. (2011)	11	3	4a
Smedley et al. (2010)	9.5	4	2a
Sorensen and Yankech (2008)	13.5	3	2b

BEME = Best Evidence in Medical Education; MERSQI = Medical Education Research Study Quality Instrument.

Most studies reported outcomes that predominately addressed participant satisfaction and self-efficacy, rather than higher level outcomes based on Kirkpatrick's levels of educational outcomes (Littlewood et al., 2005). One critical finding was the lack of rigorous interventional studies designed with valid and reliable assessment tools, control groups, and control for extraneous variables. The findings of this review highlight the challenges of experimental educational research in the nursing professional development specialty.

Study findings add an increased understanding of the psychometric properties of the MERSQI and BEME instruments. The MERSQI mean score of 11.38 (SD = 2.21) in this study is consistent with Reed et al. (2008; mean = 10.7, SD = 2.5) for accepted manuscripts for publication in medical education, supporting it as a valid and reliable instrument. A weak, nonsignificant correlation between the MERSQI and BEME strength scores (r = .13, p > .05) is inconsistent with Cook et al. (2011), who found a significantly positive moderate correlation (r = .58, p = .001). However, these findings are conceptually logical given that greater sensitivity can be obtained with an instrument with a greater number of items and suggest that the BEME and MERSQI are measuring different dimensions of quality.

LIMITATIONS OF THE STUDY

This review has several limitations. First, studies included in the review were implemented in a variety of inpatient clinical settings and may not be generalizable to all healthcare environments. Second, exclusion of qualitative studies potentially impacts the depth and richness of information synthesized. Third, given the high volume of the synonyms used in the search strategy, it is possible to have inadvertently omitted a relevant study.

PRACTICE IMPLICATIONS FOR THE NPDS

The major practice implication is the limited body of knowledge supporting specific interventions and their efficacy in developing preceptors. The NPDS is tasked to evaluate preceptor development programs' impact on their organization's results and patient outcomes, in addition to evaluating participant satisfaction. Implications for further research include the need for more reliable and valid instruments to measure learning and application, more rigorous research design, and measurement of organizational and patient benefits.

CONCLUSION

This systematic review found a limited body of literature evaluating interventions to support preceptor development. Of the studies that were located, many had design and methodological concerns. Most of the studies evaluated multimodal interventions; therefore, assessment of the impact of any particular component was problematic. Future research should focus on more rigorous study design and evaluation using high-level outcome measures.

ACKNOWLEDGMENTS

The authors would like to acknowledge and thank the Association for Nursing Professional Development for supporting this research study through a grant.

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