

REVIEWS

Virtual mentoring in nursing education: A scoping review of the literature

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ABSTRACT

Background and objective: Large numbers of nurse educators are retiring, creating a paucity of experienced advisors and research investigators to mentor nurse educators. The guiding of doctoral students in nursing is at a demanding crossroad. A new mentoring approach is needed within nursing education to support doctoral students who wish to transition to nursing education and current nurse educators who wish to further the science of nursing education. A scoping review was conducted to determine what is currently known from the existing literature about virtual mentoring in nursing education.

Methods: Literature published between 2012 and 2017 was reviewed from two electronic databases using the key words virtual mentoring, e-mentoring, cyber mentoring, online mentoring, tele-mentoring, nursing education, and college or university or higher education. The framework from Arksey and O'Malley was utilized for this study.

Results: Two themes have been identified: Technological Support for the Virtual Mentoring Role and Evolving Virtual Mentoring Programs in Nursing Education.

Conclusions: The available current research fails to adequately answer the research question. Further research into doctoral nursing graduates lived experience of a formal virtual mentoring program and building upon the virtual mentoring experience is needed.

Key Words: Virtual mentoring, Nursing education, Nursing student, College or university or higher education

1. INTRODUCTION

The Bureau of Labor Statistics' estimates the available job openings for nurses to be approximately 1.09 million by 2024 due to growth and replacement positions while the overall total number of the RN workforce will increase to 3.2 million by 2024.^[1] This demand for nurses may result in a nursing deficit if nursing student enrollment does not continue to increase or declines.^[2] While the need for future nurses continues to increase rapidly, nursing faculty vacancies persist which limits nursing student capacity rates in schools of nursing.^[3,4] This capacity limitation affects not

only undergraduate students but graduate students as well.^[3]

According to the American Association of Colleges of Nursing,^[3] approximately 64,067 eligible candidates from baccalaureate and graduate nursing programs in 2016 were not admitted due to nursing faculty vacancies. Specifically at the graduate program level, 9,757 eligible candidates were precluded from master's programs, and 2,102 eligible candidates were excluded from doctoral programs due to nursing faculty vacancies.^[3] Nursing faculty vacancies are partially due to an aging nursing faculty workforce^[4] with future mass retirements of faculty expected. In addition, few young nurses

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are entering nursing academia in faculty roles.^[5] The lack of young nurses entering nursing academia as faculty may be due to a number of factors such as heavy workloads,^[6,7] low salaries in comparison to clinical nursing practice,^[7,8] and the lack of a structured mentoring program for new faculty by an experienced faculty mentor.^[7,9]

This shortfall of nursing faculty is happening simultaneously with the growth of doctoral programs in nursing, resulting in an increased demand on a limited number of experienced faculty mentors and researchers.^[10,11] The growth of doctoral programs in nursing coincides with the Institute of Medicine^[12] recommendation to double the number of doctorally prepared nurses by 2020. Within one year, student enrollment in research-focused nursing programs increased by 3.2% and student enrollment in practice-focused nursing programs increased by 26.2%.^[13] Approximately 303 practice-focused nursing programs are enrolling doctoral students and an additional 124 new practice-focused programs are in the planning stages.^[3] Due to overall increases in doctoral enrollment, nursing education is being challenged to produce more doctorally prepared nurse educators who will be responsible for the advancement of nursing education knowledge. However, due to the increased numbers of nurse educators retiring, a paucity of experienced advisors and investigators to mentor doctoral nurse educators exists.^[5,10,11,14,15] This shortfall of nursing faculty mentors and researchers supports how the mentoring of current doctoral students in nursing is at a demanding crossroad.^[10,11,14-16]

A new approach to mentoring within nursing education is necessary to offer assistance to not only doctoral students who desire to move into a nursing education position but also to support current nurse educators who wish to further the science of nursing education. Virtual mentoring may be this new method to mentoring in nursing education yet very little is known about the concept. Virtual mentoring is the establishment of a professional development relationship between a mentor and mentee within a technological platform.^[11,17] Virtual mentoring is known by a variety of terms such as cyber mentoring, tele-mentoring, e-mentoring, and online mentoring and for the purpose of this scoping review, the term virtual mentoring will be utilized. Since robust methods of mentoring, such as virtual mentoring, are needed in nursing education, it is important to know what is known in the nursing education literature to aid nursing faculty in the implementation of virtual mentoring and virtual mentoring programs.

2. METHOD

A scoping review of the literature was performed to determine what is known regarding virtual mentoring in nursing

education. Scoping reviews explore the existing literature on a phenomenon in terms of its extent, nature, and volume.^[18,19] Scoping reviews can also be used to examine the range of the phenomenon, identify gaps in the literature, and clarify key concepts.^[18,20,21] Scoping literature reviews vary in comparison to other literature reviews, as they tend to be broader in nature, utilizing various types of literature,^[18] unlike meta-analyses that look solely at quantitative study results.^[22] This scoping review will allow the authors to gain a broader understanding of virtual mentoring in nursing education and identify any research gaps regarding virtual mentoring in nursing education.^[18,23] The methodology to support the scoping review was guided by Arksey & O'Malley's^[18] methodology and included research and non-research articles, as well as grey literature. There are four steps associated with Arksey & O'Malley's^[18] methodology and they include identifying the research question, identifying relevant studies, study selection, and charting the data. Currently, a review of literature regarding virtual mentoring in nursing education does not exist and a scoping review may help clarify the phenomenon and provide future direction regarding the topic.

2.1 Identifying the research question

This first step in a scoping review is to identify the research question that is associated with the review.^[18] This scoping review was conducted to answer the following research question, what is known from the existing literature about virtual mentoring in nursing education?

2.2 Identifying relevant studies

The second step in Arksey & O'Malley's^[18] scoping review methodology includes the identification of relevant articles related to the research question through the search of multiple databases. To follow the framework of Arksey & O'Malley,^[18] multiple data base searches were conducted from February 2017 to June 2017 to locate all relevant articles. Electronic databases, references lists, and web-based searches, utilizing only the English language, were used as search tools to locate existing literature. Similar sequencing of key word combinations were used and the list of key search words can be found in Table 1. The initial search placed emphasis on articles published in English between the years of 2012-2017. The search years were limited to the 2012-2017 timeframe to make an effort to have the most current literature available. The search was also limited to nursing education to ensure that only relevant literature related to the research question was included.

The electronic databases utilized for the literature search included Cumulative Index to Nursing and Allied Health Lit-

erature (CINAHL) and ProQuest Nursing and Allied Health (ProQuest). The databases selected were chosen related to their connection to the research question and the vast amount of literature available concerning nursing education. Following the guidelines of Arksey and O’Malley’s^[18] framework, the databases were searched on multiple occasions to ensure that all new relevant data was obtained. Additionally, Pro-

Quest Dissertation was reviewed multiple times to search for any grey literature related to the research question. An extremely large number of results was found and therefore, a qualifier of “virtual mentoring in nursing education” was used to narrow the search in ProQuest Dissertation and the authors reviewed all relevant references.

Table 1. Key search words

Search Words	Search Limiters
Virtual mentoring	Written in English
e-Mentoring	Published between 2012-2017
Tele-mentoring	Peer Reviewed
Cyber mentoring	
Online mentoring	
Nursing Education	
Nursing Student*	
College or University or Higher Education	

*Limited to abstract when searching in ProQuest Dissertations

2.3 Study selection

The third step of the scoping review involves the study selection. In this step, exclusion and inclusion criteria are determined to eliminate articles that are not pertinent to the research question.^[18] A total of 9,858 potential articles were identified through the selected databases. All of the 9,858 articles were reviewed and the inclusion and exclusion criteria, listed in Table 2, was applied. After exclusion criteria was

applied to the 9,858 articles, 92 articles were compiled for further review. The 92 articles were reviewed and exclusion criteria was applied to the abstracts. Based on the findings, 33 articles were selected for a full review. The articles were reviewed based on the inclusion and exclusion criteria in Table 2, and six articles were selected for full review. Figure 1 offers the study selection process.

Table 2. Inclusion & exclusion criteria

Inclusion Criteria	Exclusion Criteria
Literature on Virtual Mentoring in Nursing Education	Literature on Virtual Mentoring in other disciplines
Timeframe of 2012-2017	Time frame older than 2012
English language	Language other than English

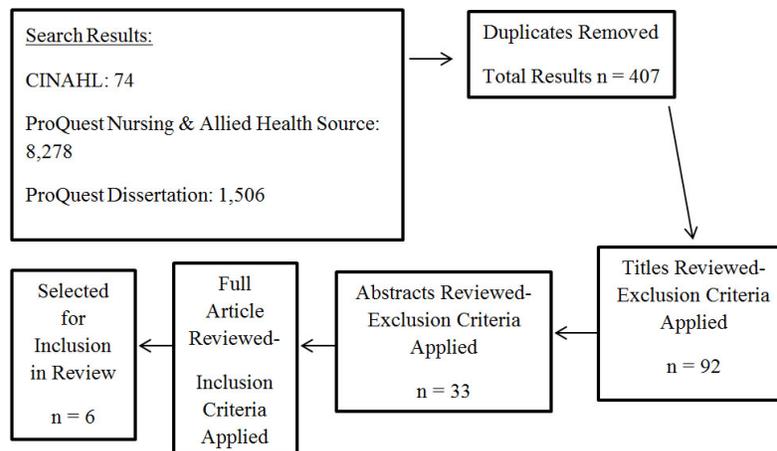


Figure 1. Study selection process

2.4 Charting the data

The fourth step in the scoping review process is to chart the data. Charting is utilized to identify commonalities and themes, which focuses on the scoping research question.^[19] With the use of a data charting form, variables associated with the research question were extracted to assist with answering the research question.^[18] The complete list of results from data charting is located in Table 3. The results are reported in a narrative form focusing on the identified themes that emerged from the literature associated with virtual mentoring in nursing education.^[20]

3. RESULTS

The articles selected for inclusion of the review were compared and examined in order to answer the research question. Levac, Colquhoun, and O'Brien^[20] recommend the use of a qualitative thematic analysis to analyze the data obtained from the scoping review. The literature was structured thematically (e.g. technology versus mentoring programs) and a content analysis method was utilized which involved open coding, theme creation, and abstraction. Themes were created based upon analytic summaries created by the authors that focused on the research question, derived directly from the texts of the articles.^[24] The thematic analysis uncovered two themes related to the research question and the themes include technological support for the virtual mentoring role and evolving virtual mentoring programs in nursing education.

3.1 Technological support for the virtual mentoring role

The utilization of technology has not only allowed for flexible learning opportunities in nursing education, but also flexible mentoring opportunities as well.^[14, 15, 17, 25] Due to innovations in technology, mentors and mentees utilize various technological platforms and tools in order to stay abreast of current and future educational opportunities.^[14, 15, 17, 25] In order for virtual mentoring to be effective, faculty and students must have access to not only technology, but also supportive mentors who are proficient with technology.^[14, 17, 25] In the virtual mentoring relationship, the mentor may also incorporate technology to advance the pedagogical expertise of the mentee,^[14, 25] as well as provide instructional feedback.^[25]

Rand and Pajarillo^[14] reported a virtual mentoring preceptorship in which the master educator displayed technological and pedagogical proficiency to the co-instructor mentee within an online undergraduate informatics course. The authors emphasized the importance of finding the “right” mentor as critical to the virtual mentor-mentee relationship. Future implications for nursing education point to the growth

of online nursing programs and the necessity of technological platforms to support virtual mentoring that exists beyond physical boundaries.^[14] Within virtual mentoring, authors have suggested that recognized technological platforms and established mentoring guidelines should be implemented to offer support for not only each individual role but also the overall mentor-mentee relationship.^[14, 15, 17, 25] Further, while individual schools or universities are responsible for the individual mentoring of faculty and students, an orientation to either the role of mentor or mentee is vital to the success of each individual.^[14, 25]

The virtual mentoring of faculty may encompass new nursing faculty and adjunct nursing faculty, both of whom are frequently novices to the nurse educator role.^[14, 25] Currently, the virtual mentoring of adjunct nursing faculty has not kept pace with the demand for adjunct faculty mentoring resources within online programs.^[25] Brannagan and Oriol^[25] revealed virtual mentoring as a flexible mentoring opportunity for adjunct nursing faculty when led by an experienced online nursing faculty member. Guided by the Online Adjunct Faculty Mentoring Model (OAFMM), the virtual mentoring of online adjunct faculty members encompassed not only an orientation to online pedagogical practices but also mentoring by an experienced online nurse educator who served as the direct mentor. In addition, technological support of the OAFMM encompassed technologies specifically selected and utilized by the mentor as a means to promote the virtual mentoring of the mentee.^[25]

3.2 Evolving virtual mentoring programs in nursing education

Virtual mentoring is a relatively new approach to mentoring in nursing education^[15, 17, 25] and provides a cost-effective experience and flexible environment.^[17, 25] However, there is a lack of widespread research to support virtual mentoring or virtual mentoring programs in nursing education.^[14, 15, 17, 25] In one quantitative study, Harris, Birk, and Sherman^[26] provided a virtual mentoring program for Doctor of Nursing Practice (DNP) students during their first year of doctoral studies. While specifics regarding the virtual mentoring program were not elaborated upon, mentors and mentees were encouraged to interact monthly via a mutually decided upon mode of communication. Surveys were distributed to students before the virtual mentoring program began to determine mentor qualities that students perceived as most valuable. Afterwards, surveys were distributed to mentors and mentees at the midpoint and end-of-the-program to evaluate the overall virtual mentoring experience (interaction frequency, communication, benefits, and if mentors were fulfilling their role).

Table 3. Results

Author & Year	Purpose	Design	Instrument	Findings & Conclusions	Limitations/Concerns
Brannagan & Oriol (2014)	To offer a theoretical premise for an adjunct nursing faculty virtual mentoring model	Informative Article	N/A	The Online Adjunct Faculty Mentoring Model (OAFMM) encompasses a broad orientation followed by the actual mentoring of the adjunct faculty member. The orientation aspect of the model offers educational information on pedagogical aspects, mission of the university and program, policies, online technologies, instructional design, and support services. The mentoring portion of the model involves a faculty member serving as a virtual mentor to the adjunct faculty member.	-Background information is offered regarding the importance of a mentor. However, specifics nor the timeline of the mentoring portion of the program was shared. -Specifics regarding how mentors and mentees evaluate the program is not provided nor are the characteristics of mentors/mentees who are most successful within the OAFMM.
Clement (2014)	To share how virtual mentoring may increase the number of nurse educators	Informative Article	N/A	With the use of virtual mentoring, nursing education could increase the number of nurse educators. In the virtual mentoring relationship, both mentor and mentee incorporate technology to advance the pedagogical expertise of the mentee and the pedagogy of nursing education.	-The use of formal guidelines and support are recommended for virtual mentoring relationships to be successful yet examples for each are not provided.
Harris, Birk, & Sherman (2016)	To provide a virtual mentoring program for 1 st year DNP students	Descriptive Study	Ideal Mentor Scale (IMS)	Analysis of the pre-virtual mentoring program IMS survey disclosed that students valued integrity over guidance or relationships from mentors. Analysis of the mid and end-of- program results revealed that both mentors and mentees found the mentoring relationship advantageous ($p < .05$); however, mid and end-of-program survey results were mixed.	-Small sample and lack of participation from participants. -Demographic data of participants was not collected. -Mixed survey comments and results offer the need for further exploration of virtual mentoring programs.
Rand & Pajarillo (2015)	To provide a virtual mentoring approach in nursing distance education (DNP course)	Informative Article	N/A	Virtual mentoring preceptorship between a master educator and DNP student instructor within an undergraduate informatics course. The importance of finding the "right" virtual mentor was emphasized as well as the use of a virtual mentoring program for novice educators. Future studies are encouraged to determine "best practice" virtual mentoring programs.	-Lack of virtual mentoring guidelines offered only reference to master educator model -Logistics of university partnership (co-instructor status, resources, salaries, workload, etc.) were not discussed
Valentin-Welch (2016)	To provide evaluation results of a virtual mentoring program for ethnically diverse student nurse midwives	Descriptive Study	ACNM, Midwives of Color Committee Mentee Survey	Analysis of the survey findings relayed no statistically significant differences between the mentors and mentees; however, increased communication and the need for geographical proximity were areas for further improvement. Further recommendations include to provide an online platform for communication and virtual mentoring program guidelines	-Research was completed in 2012; yet, published in 2016. This delay in publication would have allowed recommendations from the 2012 research to be implemented in 2016 published offering -Small sample size
Welch (2017)	To provide the lived experiences of doctoral nursing students who participated in an online virtual mentoring program.	Phenomenological study	N/A	Phenomenological study offerings by the author revealed the patterns of Confirmation of Mentoring, Building Community, and Learning the Role of a Doctoral Student. Further recommendations include increasing mentoring support for doctorally prepared nurse educators and their experienced mentors. Future research studies are necessary on virtual mentoring programs in doctoral nursing education.	-Single site research -Study took place within students' doctoral program -Implications offered for future research studies on virtual mentoring and virtual mentoring programs; yet, specifics regarding types of research is not shared.

The authors did not provide the validity and reliability of the tool, a modified Ideal Mentor Scale survey developed for PhD students. Analysis of the survey findings revealed that DNP mentors and students found the virtual mentoring relationship helpful ($p < .05$); yet, survey comments revealed mixed results from both mentors and mentees alike. Active engagement and increased mentor-mentee interactions online may have offered a more beneficial virtual mentoring program for all participants as the end-of-program survey results disclosed that mentors and mentees communicated infrequently (consistent with Valentin-Welch^[26]). Recommendations included to emphasize virtual mentoring program benefits, provide an online platform for communication (coincides with Valentin-Welch;^[26] Welch^[15]), and continuously evaluate a virtual mentoring program for further means of improvement.^[27]

Valentin-Welch^[26] revealed, through survey research, the evaluation of a virtual mentoring program to support minority midwifery students. In order to participate in the virtual mentoring program, both mentors and mentees submitted applications to a national organization and mentors selected for the program were generally minority midwives. Analysis of the survey findings relayed no statistically significant differences between the mentor and mentee groups; however, increased communication and the need for geographical proximity were areas for further improvement. While the increased need for communication coincides with others,^[27] the request for geographical proximity could be overcome with the utilization of technology^[14,17,25] as the only methods of communication utilized in the program were via telephone and email.^[26] Further recommendations included to provide an online platform for synchronous communication (coincides with Valentin-Welch;^[26] Welch^[15]) and develop program guidelines for subsequent virtual mentoring programs.^[14,15,17,25]

Within a phenomenological study, Welch^[15] reported on doctoral nursing students who took part in a formal virtual mentoring program at a single-site institution. Within the virtual mentoring program, doctoral students were assigned a virtual academic mentor from the school. Workplace mentors were also encouraged, depending upon each doctoral student's availability of doctorally prepared faculty at their individual workplaces. Multiple platforms for the virtual mentoring program were initiated via Google+[©]; however, specific guidelines for the program were not offered. Regardless of a lack of program guidelines, mentors and mentees met on an individual basis within the program as mentors were vested in the program. The doctoral students ($n = 8$) lived experiences were reported through the patterns of Confirmation of Mentoring, Building Communities, and Learning the

Role of a Doctoral Student. The Confirmation of Mentoring encompassed the participants' realization of the formal virtual mentoring program and the academic and personal support incorporated in the program. Due to the virtual mentoring program, students were able to expand their levels of academic and social support as mentoring relationships were developed and understood as emphasized in the second pattern, Building Communities. In Learning the Role of a Doctoral Student, participants offered elements for success learned via the virtual mentoring program such as the importance to balance time.^[15] Findings from the formal virtual mentoring program may assist other graduate programs in nursing education who desire to begin such a mentoring program.^[15] The implications for future studies included the lack of education regarding mentor qualities,^[11] the limited population of experienced virtual mentors available in doctoral nursing education,^[15,27] and the need for further research on virtual mentoring program within doctoral nursing education.^[15]

4. CONCLUSIONS

Virtual mentoring in nursing education is minimally documented in nursing literature. Much of nursing literature concluded that virtual mentoring in nursing education is poorly understood, especially in relation to a formal virtual mentoring program. As the number of retiring mentors and researchers in nursing education continues to grow, so does the need for formal virtual mentoring programs in doctoral education. This scoping review uncovered the importance of technological platforms and technological proficiency in virtual mentoring as well as the evolving virtual mentoring programs in nursing education. Unfortunately, the literature does not provide nursing faculty with enough information regarding virtual mentoring in nursing education.

For example, a lack of phenomenological literature exists regarding doctoral nursing graduates who took part within a virtual mentoring program and how the graduates built upon the mentoring experience. Furthermore, the available literature does not provide details surrounding whether or not alumni found other mentors after graduation or if alumni are mentoring others. Without further knowledge on the experiences of virtual mentoring programs, newly doctorally prepared nursing faculty are likely to struggle as fewer numbers of experienced mentors and researchers will be available to foster their success. While this scoping review provided some insight into virtual mentoring in nursing education, the available literature failed to answer the research question. Therefore, additional research is needed concerning virtual mentoring in nursing education.

BIO STATEMENT

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