

BMJ Open Exploring the role of the nurse manager in supporting point-of-care nurses' adoption of electronic health records: protocol for a qualitative research study

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ABSTRACT

Introduction An increasing number of electronic health record (EHR) systems have been implemented in clinical practice environments where nurses work. Findings from previous studies have found that a number of intended benefits of the technology have not yet been realised to date, partially due to poor system adoption among health professionals such as nurses. Previous studies have suggested that nurse managers can support the effective adoption and use of the technology by nurses. However, no known studies have identified what role nurse managers have in supporting technology adoption, nor the specific strategies that managers can employ to support their staff. Therefore, the purpose of this research is to better understand the role of the nurse manager in point-of-care nurses' use of EHRs, and to identify strategies that may be effective in supporting clinical adoption.

Methods and analysis This study will use a qualitative descriptive design. Interviews with both nurse managers and point-of-care nursing staff will be conducted in a Canadian mental health and addiction healthcare organisation where an EHR has been implemented. A semistructured interview guide will be used, and interviews will be audio recorded. Transcripts will be analysed using a directed content analysis technique. Strategies to ensure the trustworthiness of the data analysis procedure and findings will be employed.

Ethics and dissemination Ethical approval for this study has been obtained. Dissemination strategies may include a paper submission to a peer-reviewed journal, a conference submission and meetings to share findings with the study site leadership team. Findings from this research will be used to inform a future study which aims to assess levels of competencies and perform a psychometric analysis of the Nursing Informatics Competency Assessment for the Nurse Leader instrument in a Canadian context.

INTRODUCTION

Electronic health records (EHRs) are repositories of patient information accessible by health professionals through information and communication technologies, and used for a number of health-related functions.¹

Strengths and limitations of this study

- This is the first known study aimed at understanding the role of nurse managers and identifying strategies that they can use to support point-of-care nurses' use of electronic health records (EHRs).
- Insights gained from this study can be used to inform future research that aims to examine the efficacy of specific strategies employed by nurse managers to support EHR adoption.
- This study will be done at a single study site using a qualitative approach, and therefore the findings may not be generalisable.

These functions may include electronic documentation, clinical decision-making support, electronic medication administration and computerised provider order entry. In the last decade, EHRs have been increasingly implemented in numerous healthcare environments.^{2–4} Evaluation studies have been conducted to determine the benefits of EHRs and related technologies to patients, health professionals and organisations.^{5–11} Findings of this work suggest that simply installing and implementing an EHR in a clinical environment does not guarantee its success in generating intended benefits. A study by Simon *et al* reported that for an EHR to be most effective, health professionals should use the technology in a consistent, appropriate and uniform way.¹² As nurses make up the largest health professional group in many countries such as the USA¹³ and Canada,¹⁴ they may be the largest group of users of EHRs.¹⁵ Therefore, understanding how to achieve consistent, appropriate and uniform use of the technology by nurses is of importance.

EHRs within mental health and addiction settings

While EHR implementations have continually grown in recent years, mental health and

addiction settings lag behind other settings in adoption rates.^{16–18} The causes of this disparity are not well understood. However, it may be partially explained by the unique needs and challenges of this population.^{17 18} In contrast to acute care medical settings, mental health and addiction settings frequently structure their care based on a collaborative treatment and recovery model of care. This means that goals of treatment and needs for quality care monitoring may differ from other settings.^{18 19} Consequently, customisation may be required for EHRs to support care in this setting. Additionally, concerns of stigma and patient confidentiality are substantial in this setting and may be perceived as a further barrier to EHR implementation.¹⁷ When EHRs are successfully implemented in mental health and addiction settings, they have been demonstrated to improve care coordination, facilitate quality assurance and improvement, support patient-centred practice and improve addiction treatment delivery.^{17 18 20} Therefore, it is of particular importance to examine how to achieve adequate use of EHR technology by nurses in this unique and understudied setting.

Nurses' adoption of EHRs

In the last decade, numerous studies have examined the factors that influence nurses' adoption of EHRs. Findings of these studies have suggested that factors related to the EHR usability,^{21–24} the organisational context^{25–27} and individual nurse characteristics,²⁸ may influence nurses' use of the technology. Specifically, several authors have discussed the importance of the nurse manager (nursing managers who are also nurses themselves) in supporting nurses' use of EHRs.^{11 29–31} Nurse managers were described in these studies as being those that had point-of-care nurses who directly reported to them. In Whittaker *et al*'s study of barriers and facilitators to nurses' use of an EHR, nurses reported that having a supportive manager was believed to facilitate their use of the system.³⁰ Yang *et al* report that nurse managers are well positioned to provide leadership and support to point-of-care nurses in their use of EHRs.³¹ Each author has identified that nurse managers play a critical role in the successful adoption and use of the technology for point-of-care nurses. However, none of the authors identified what role nurse manager's play in providing support and the related effectiveness of implemented strategies. Therefore, this research will seek to identify the role of nurse managers in providing support, in order to enhance point-of-care nurses' adoption of EHRs in organisations that currently have EHRs implemented.

This study is important as no known studies have explored this topic in the past, and there is expected to be an increasing number of EHRs implemented in organisations where nurses work in the coming decade. Research that aims to identify the role of nurse managers in providing EHR support, and what type of support is effective, may allow for interventions to be developed and researched that enhance point-of-care nurses' adoption of EHRs. It is possible that benefits of the technology may

be realised when nurses are adequately supported and are able to effectively use the systems in their work.

METHODS AND ANALYSIS

Research questions

Given that there has been little research to date examining the role that nurse managers play in supporting point-of-care nurses' adoption and use of EHRs, the authors aim to address the following research questions:

1. What role do nurse managers play in supporting point-of-care nurses' adoption of EHRs?
2. What strategies have nurse managers used to support point-of-care nurses use of EHRs, and how do point-of-care nurses perceive these strategies?

Theoretical framework

This study will draw on the Staggers and Parks Nurse-Computer Interaction Framework (SPNCIF).³² The SPNCIF was developed by nursing informatics researchers in the USA and has been used in the study of nurses' adoption of EHRs to identify relevant contextual, system/usability and individual nurse characteristics that may influence nurses' adoption of the technology.^{30 32 33} Given that SPNCIF has been found to be useful in identifying barriers and facilitators of EHR adoption in previous research,³⁰ the framework will provide a structure by which strategies identified by nurse managers and point-of-care nursing staff to support nurse use of these systems can be understood. In this study, the SPNCIF will be used to guide both data collection and analysis, given that supports provided by nurse managers may be attributed to the three domains of the framework (contextual, system/usability, individual nurse characteristics).

Design

This study will employ a qualitative descriptive approach³⁴ consisting of semistructured individual interviews with both nurse managers and point-of-care nursing staff.

Sample

The sample of participants in this study will consist of both nurse managers and point-of-care nursing staff. Nurse managers are considered those who directly supervise and oversee point-of-care nursing staff in a particular care setting. These managers may be responsible for both administrative and clinical tasks such as hiring, managing, scheduling and disciplining nursing staff, promoting the use of best practice and managing patient and family feedback. There are a number of job titles that nurse managers may have, including: 'nursing unit administrator', 'nurse manager', 'unit manager', 'nursing director' and others. Managers who are female or male will be included in this study.

Point-of-care nursing staff are defined in this study as those who provide direct care to patients as either registered nurses or registered/licensed practical nurses. Nurses working in advanced practice roles, such as nurse

practitioners and clinical nurse specialists will be excluded from this study given their differing work patterns and use of the EHR. Participants (nurse managers and point-of-care nursing staff) who have been in their roles for a minimum of 1 year will be eligible to participate in the study. This criterion was set to ensure that only those participants who are familiar with their own roles as either a nurse manager or point-of-care nursing staff are included in this study. In this study, a diverse group of point-of-care nurses will be recruited with varying levels of experience both in their role as a nurse, the length of time they have used an EHR and their mental health nursing experience. Both male and female point-of-care nurses will be included in this study.

Typical case sampling, a subset of purposive sampling, will be used to ensure that participants are typical of the age range, education and work experience of nurse managers, and point-of-care staff employed at the organisation.³⁵ This will also be done to ensure that a range of participant responses are captured during the interviews that represent those of the average nurse manager or point-of-care nurse. Information on nurse manager and point-of-care nurse age, education and work experience will be obtained through internal organisational documents and resources. This information will be used to select an appropriate sample of participants.

Interviews with participants will be conducted until data saturation has been obtained. In a previous study aimed at identifying the barriers and facilitators to point-of-care nurses' use of an EHR, data saturation was achieved after 11 point-of-care nurses had been interviewed.³⁰ It is therefore expected that between 10 and 12 interviews will be conducted for each group (nurse managers and point-of-care staff) totalling 20–24 interviews. However, it is possible that a lesser or greater number of participants is required to reach data saturation in this study.

Setting

This study will be conducted at a large mental health organisation in an urban setting in Ontario, Canada. This organisation has implemented a comprehensive EHR with several common functionalities including computerised provider order entry, electronic medication administration, bar-coded medication administration, clinical documentation and laboratory and results reporting and viewing. The EHR has been implemented throughout the organisation, and nurses (and other clinical staff) are required to use the system to obtain information, make decisions and document assessments and care provided. Point-of-care nursing staff receive 2 days of training on the EHR, while nurse managers receive varying amounts of training ranging from none to 2 days. The particular EHR in place was developed by an external vendor and is present in a number of healthcare organisations both locally and internationally. Customisations for particular fields and forms have been made to the EHR at the study site; however, the design and functionality remain similar

to those implemented at other organisations with the same vendor.

Recruitment and data collection

Participants in this study will be recruited via an email invitation to their work email account that informs potential participants of the study purpose, details of participating and voluntary nature of the study. The invitation will be sent from one of the researchers' email accounts and not by any person that a point-of-care nurse or manager may report to. Emails of potential participants are available to researchers through internal organisational documents. On receiving the email invitation, if a potential participant is in agreement, the researcher will coordinate a date, time and place for the interview to take place. The research team will send a copy of the informed consent letter via email for the potential participant to read ahead of time. Once the research team and potential participant meet to conduct the interview, the research team will inform the potential participant again about the purpose of the study, details of participating and the voluntary nature of the study. There will be time for the potential participant to ask questions of the researcher during this time. Lastly, the informed consent letter will be signed before the interview begins.

Semistructured interview guides specific to each group of participants (nurse manager or point-of-care nursing staff) have been developed (see [tables 1 and 2](#)). The interview guides were developed so that participant responses could be mapped to the SPNCIF. The questions were purposefully broad so that the questions were not leading and so that participant responses could be mapped to the framework domains. Whittaker *et al*³⁰ used the same approach when completing a similar study of point-of-care medical-surgical nurses using the SPNCIF.

The specific researchers who will be involved in various elements of the study, their credentials, their occupation at the time of the study, their gender and both their experience and training, will be detailed in any dissemination materials.

These interview guides were developed based on relevant literature, the theoretical framework and the research questions in this study. Each interview guide consists of six open-ended questions. Participants will also be asked to provide the type of nursing registration they hold (registered nurse or registered/licensed practical nurse), years of experience using the EHR and years of experience working as a mental health nurse. It is expected that interviews will take approximately between 20 and 45 min depending on the amount of detail provided by the participant. By using a semistructured interview approach, all participants will be guided through the same sets of questions; however, the interviewer will have the opportunity to probe further when required to gain a deeper understanding of the participant's perspectives. No incentives will be provided to participants.

Interviews will be conducted in quiet meeting rooms throughout the organisation where this study will take

Table 1 Semistructured interview guide for managers

Welcome and thank you for agreeing to participate in this study.

The purpose of the study is to examine the role that nurse managers play in supporting point-of-care nurses' use and adoption of electronic health records such as (name of EHR).

During this interview, you will be asked to share your perspective as a manager. Please do not discuss anything that was said today outside of this interview. As well, this interview will be audio recorded; however, no identifying information such as your name, will be transcribed from the recordings.

Do you have any questions before we begin?

Question 1	What do you believe your is in providing support to point-of-care nurses in their use of (name of EHR)?
Question 2	What strategies have you used to support point-of-care nurses' use of (name of EHR)?
Question 3	Can you describe for me which strategies that you have used that have been particularly effective in supporting nurses' use of (name of EHR)?
Question 4	Can you describe for me which strategies that you have used that have not been effective in supporting nurses' use of (name of EHR)?
Question 5	Are there other strategies that you would like to do to support point-of-care nurses' use of (name of EHR)? Follow-up: How come? How come you have not been able to implement this strategy thus far? What might it take for you to be able to implement this strategy?
Question 6	Is there anything else you would like to share with me about your support of point-of-care nurses' use of (name of EHR)?

Thank you for participating in this interview. Everything that was said today will remain confidential.

place. Although it is unlikely that someone would know that a participant is going into a meeting room to participate in this study, these rooms will purposefully be booked in areas of the organisation where the participant is not routinely working, for example, not on the clinical unit where the participant is working or responsible for.

Interviews will be audio recorded and transcribed verbatim via an external transcription service with appropriate data security measures in place. No names will be transcribed; instead pseudonyms will be used. Once the study has been completed, the original audio recording will be deleted. The audio recorder will be kept in a

locked filing cabinet in a locked room. The transcriptions will be kept in an internal electronic secure folder only accessible by the principal investigator.

Analysis

Interview data transcriptions will be entered into NVivo qualitative data analysis software (QSR International, V.11, 2014). Data analysis will be completed via a directed content analysis³⁶ based on the domains from the SPNCIF. This is an appropriate technique given that the framework was used to guide the study methodology and semistructured interview guide. Predetermined codes

Table 2 Semistructured interview guide for point-of-care nurses

Welcome and thank you for agreeing to participate in this study.

The purpose of the study is to examine the role that nurse managers play in supporting point-of-care nurses' use and adoption of electronic health records such as (name of EHR).

During this interview, you will be asked to share your perspective as a point-of-care nurse. Please do not discuss anything that was said today outside of this interview. As well, this interview will be audio recorded; however, no identifying information such as your name, will be transcribed from the recordings.

Do you have any questions before we begin?

Question 1	What do you believe your managers' role is in providing support to point- of-care nurses in their use of (name of EHR)?
Question 2	What strategies has your manager used to support point-of-care nurses' use of (name of EHR)?
Question 3	Can you describe for me which strategies that your manager has used that have been particularly effective in supporting nurses' use of (name of EHR)?
Question 4	Can you describe for me which strategies your manager has used that have not been effective in supporting nurses' use of (name of EHR)?
Question 5	Are there other strategies that you would like to see your manager use to support your use of (name of EHR)?
Question 6	Is there anything else you would like to share with me about your managers support of point-of-care nurses' use of (name of EHR)?

Thank you for participating in this interview. Everything that was said today will remain confidential.

will be developed based on these domains. Two members of the research team will first independently apply these codes to the interview data. These team members will then meet to compare and contrast their findings. Where disagreements in the applied coding are discovered, the two research team members will discuss the emergent coding and come to a consensus regarding its interpretation. If consensus cannot be achieved by the two research team members, the entire research team will be involved in analysing the data and coming to agreement regarding the proper code to associate to a particular set of data.

Data that cannot be attributed to a predetermined code will be subject to open coding through an inductive analysis process. During this time, new codes may be generated to represent findings that did not apply to the predetermined codes. Any disagreements regarding the need to use open coding will be attempted to be resolved through discussion between the two researchers involved in the coding. However, in cases when agreement cannot be reached, another member of the research team will be consulted.

Trustworthiness

The authors will take several measures to conduct a credible and trustworthy study.³⁷ First, experts in both the subject area and qualitative research methods have assisted in the conceptualisation and development of the study protocol. Second, direct quotes arising from participants will be used to demonstrate alignment to the SPNCIF domains, and serve as a method to increase credibility of analysis. To improve the dependability and trustworthiness of the analysis process, two members of the research team will remain embedded in the data and independently code the raw data to the framework. Member-checking with two nurse managers and two point-of-care staff members who participated in the study will also be completed to ensure credibility and meaning were captured appropriately within the preliminary analysis.

ETHICAL CONSIDERATIONS

This study is considered to be of low risk, and the participants are not considered vulnerable. Ethical approval (2016-17.117) has been obtained from the organisation in which this study will take place.

DISCUSSION AND DISSEMINATION

The proposed study is significant for several reasons: (1) it examines the role of nurse managers in supporting point-of-care nurses' use of EHRs, which is currently unclear in the literature and in practice environments and (2) it is the first study to allow for the identification of strategies that nurse managers can implement to support effective EHR implementation and adoption by point-of-care nurses. Results of this study will be of value to nurse managers and hospital leaders who have or plan to implement

an EHR in their clinical environment. Therefore, the authors plan to pursue dissemination strategies that are targeted at nurse managers and hospital leaders through an academic peer-reviewed journal article submission. A journal that focuses on the topic of nursing management, administration or leadership will be selected. In addition to a journal article, the authors plan to submit an abstract for a presentation at the Nursing Leadership Network of Ontario annual conference. This conference is an appropriate forum as the attendees are made up of nurse managers, administrators and leaders. In addition, the findings from this research will be shared with the senior leadership team at the study site.

The results of this research will be used to develop a future study which aims to: (1) assess levels of informatics competencies of nurse leaders and (2) perform a psychometric analysis of the Nursing Informatics Competency Assessment for the Nurse Leader (NICA-NL) instrument in a Canadian context. The NICA-NL is a self-assessment instrument that can be used by nurse leaders (inclusive of nurse managers) to evaluate their level of nursing informatics competencies.³⁸ Information obtained from this future study in combination with findings from the present study, can be used to identify areas where Canadian resources may be created to support the development of specific informatics competencies for nurse leaders, inclusive of nurse managers.

CONCLUSION

This research will make an important contribution to the nursing informatics literature in that it will be the first study aimed at better understanding the role of the nurse manager in point-of-care nurses' adoption of EHRs, and what strategies are effective. End-of-study dissemination strategies of the research results have therefore been planned to inform relevant stakeholder groups of the study findings. In addition, the results will be used to develop a future research study which aims to assess levels of competencies and perform a psychometric analysis of NICA-NL in a Canadian context.

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REFERENCES

- Häyrinen K, Saranto K, Nykänen P. Definition, structure, content, use and impacts of electronic health records: a review of the research literature. *Int J Med Inform* 2008;77:291–304.
- Canada Health Infoway [Internet]. Progress in Canada. 2017 <https://www.infoway-inforoute.ca/en/what-we-do/progress-in-canada>
- Charles D, Gabriel M, Searcy T. Adoption of electronic health record systems among U.S. non-federal acute care hospitals: 2008–2014. *Office of the National Coordinator for Health Inf Technology* 2015;23:1–10.
- The Commonwealth Fund [Internet]. What is the status of electronic health records. 2017 <http://international.commonwealthfund.org/features/ehrs/>
- Bjarnadottir RI, Herzig CTA, Travers JL, et al. Implementation of electronic health records in US nursing homes. *Comput Inform Nurs* 2017;35:417–24.
- Bowman S. Impact of electronic health record systems on information integrity: quality and safety implications. *Perspect Health Inf Manag* 2013;10:1c.
- Chaudhry B, Wang J, Wu S, et al. Systematic review: impact of health information technology on quality, efficiency, and costs of medical care. *Ann Intern Med* 2006;144:742–52.
- Campanella P, Lovato E, Marone C, et al. The impact of electronic health records on healthcare quality: a systematic review and meta-analysis. *Eur J Public Health* 2016;26:60–4.
- Koppel R, Wetterneck T, Telles JL, et al. Workarounds to barcode medication administration systems: their occurrences, causes, and threats to patient safety. *J Am Med Inform Assoc* 2008;15:408–23.
- Patterson ES, Rogers ML, Chapman RJ, et al. Compliance with intended use of bar code medication administration in acute and long-term care: an observational study. *Hum Factors* 2006;48:15–22.
- Poissant L, Pereira J, Tamblin R, et al. The impact of electronic health records on time efficiency of physicians and nurses: a systematic review. *J Am Med Inform Assoc* 2005;12:505–16.
- Simon SR, Kaushal R, Cleary PD, et al. Physicians and electronic health records: a statewide survey. *Arch of Intern Med* 2007;167:507–12.
- American Association of Colleges of Nursing [Internet]. Nursing fact sheet, 2017. <http://www.aacn.nche.edu/media-relations/fact-sheets/nursing-fact-sheet>
- Canadian Nurses Association [Internet]. Framework for the Practice of Registered Nurses in Canada, 2017. <https://www.cna-aic.ca/~media/cna/page-content/pdf-en/framework-for-the-practice-of-registered-nurses-in-canada.pdf?la=en>
- Kutney-Lee A, Kelly D. The effect of hospital electronic health record adoption on nurse-assessed quality of care and patient safety. *J Nurs Adm* 2011;41:466–72.
- The Office of the National Coordinator for Health Information Technology [Internet]. Data Brief, 2017. [/evaluations/data-briefs/non-federal-acute-care-hospital-ehr-adoption-2008-2015.php](http://evaluations/data-briefs/non-federal-acute-care-hospital-ehr-adoption-2008-2015.php)
- McGregor B, Mack D, Wrenn G, et al. Improving service coordination and reducing mental health disparities through adoption of electronic health records. *Psychiatr Serv* 2015;66:985–7.
- Riahi S, Fischler I, Stuckey MI, et al. The value of electronic medical record implementation in mental health care: a case study. *JMIR Med Inform* 2017;5:e1.
- Oades L, Deane F, Crowe T, et al. Collaborative recovery: an integrative model for working with individuals who experience chronic and recurring mental illness. *Australas Psychiatry* 2005;13:279–84.
- Ghitza UE, Sparenborg S, Tai B, et al. Improving drug abuse treatment delivery through adoption of harmonized electronic health record systems. *Subst Abuse Rehabil* 2011;2011:125–31.
- Ammenwerth E, Ehlers F, Hirsch B, et al. HIS-Monitor: an approach to assess the quality of information processing in hospitals. *Int J Med Inform* 2007;76:216–25.
- Carayon P, Cartmill R, Blosky MA, et al. ICU nurses' acceptance of electronic health records. *J Am Med Inform Assoc* 2011;18:812–9.
- Carrington JM, Effken JA. Strengths and limitations of the electronic health record for documenting clinical events. *Comput Inform Nurs* 2011;29:360–7.
- Schenk EC, Mayer DM, Ward-Barney E, et al. RN perceptions of a newly adopted electronic health record. *J Nurs Adm* 2016;46:139–45.
- Ch L, Hsiao JL, Chen RF. Factors determining nurse acceptance of hospital information systems. *Comput Inform Nurs* 2012 30 257 64.
- Maillet É, Mathieu L, Sicotte C. Modeling factors explaining the acceptance, actual use and satisfaction of nurses using an electronic patient record in acute care settings: an extension of the UTAUT. *Int J Med Inform* 2015;84:36–47.
- Saleem JJ, Plew WR, Speir RC, et al. Understanding barriers and facilitators to the use of Clinical Information Systems for intensive care units and Anesthesia Record Keeping: a rapid ethnography. *Int J Med Inform* 2015;84:500–11.
- Ifinedo P. The moderating effects of demographic and individual characteristics on nurses' acceptance of information systems: a canadian study. *Int J Med Inform* 2016;87:27–35.
- Ash JS, Bates DW. Factors and forces affecting EHR system adoption: report of a 2004 ACMI discussion. *J Am Med Inform Assoc* 2005;12:8–12.
- Whittaker AA, Aufdenkamp M, Tinley S. Barriers and facilitators to electronic documentation in a rural hospital. *J Nurs Scholarsh* 2009;41:293–300.
- Yang L, Cui D, Zhu X, et al. Perspectives from nurse managers on informatics competencies. *ScientificWorldJournal* 2014;2014:1–5.
- Staggers N, Parks N. Description and initial applications of the staggers and parks nurse-computer interaction framework. *Comput Inform Nurs* 1993;11:282–90.
- Staggers N, Kobus D. Comparing response time, errors, and satisfaction between text-based and graphical user interfaces during nursing order tasks. *J Am Med Inform Assoc* 2000;7:164–76.
- Sandelowski M. Whatever happened to qualitative description? *Res Nurs Health* 2000;23:334–40.
- Palinkas LA, Horwitz SM, Green CA, et al. Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Adm Policy Ment Health* 2015;42:533–44.
- Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res* 2005;15:1277–88.
- Guba EG, Lincoln YS. Competing paradigms in qualitative research. In: Denzin NK, Lincoln YS, eds. *Handbook of qualitative research*. Thousand Oaks, CA: Sage, 1994:105–17.
- Yen PY, Phillips A, Kennedy MK, et al. Nursing informatics competency assessment for the nurse leader: instrument refinement, validation, and psychometric analysis. *J Nurs Adm* 2017;47:271–7.