Readiness and leadership in evidence-based practice and knowledge management: A cross-sectional survey of nurses’ perceptions

Anne Lunden1,2, Tarja Kvist2, Marianne Teräs3 and Arja Häggman-Laitila2

Abstract
Although research on evidence-based practice (EBP) has been available for several decades, EBP has not been implemented successfully by nursing management. Evidence-based practice is a key area of knowledge management (KM), and EBP and KM are subject to similar challenges. However, there has only been limited research on KM and EBP within the context of nursing. The aim of this study was to describe and explain nurses’ perceptions of their own readiness for EBP, and their perceptions of the managerial and organizational support for enhancing competency and EBP. The study design was a cross-sectional survey carried out in accordance with STROBE. Data were collected from 125 nurses using two international instruments and one instrument developed for this study. The data were then analyzed using descriptive and multivariate statistics. Less than half of the nurses reported that their practices were often evidence-based, and only a third had often searched for evidence. The nurses perceived the weakest areas of management leadership to be arranging resources, solving problems and encouraging discussion in the context of EBP, and anticipation of nurses’ competency needs, ensuring competency and intervening when competency was inadequate in the context of KM. The results emphasize the need to develop nurse training, management leadership and an operational environment conducive to KM and EBP. Managers should take a more visible role in mentoring nurses for EBP and in identifying the developmental needs of nurses’ competencies.

Keywords
competency, evidence-based practice, knowledge management, leadership, support

Accepted: 24 November 2020

Introduction
Competency in evidence-based practice (EBP) has been a global goal of nursing ever since the late 1990s. Evidence of the factors promoting and preventing EBP has been collected for several decades, but efforts to utilize it in nursing leadership have failed, and implementation of research evidence in nursing remains poor. This means that the target set by the Institute of Medicine of 90% of decision-making being evidence-based by 2020 has not been achieved.

Evidence-based practice is the integration of the best available research evidence with clinical expertise, and patients’ values, preferences and clinical circumstances, in decision-making. Nurses’ EBP competencies encompass their knowledge and skills, attitudes and beliefs, about EBP, and their ability to employ EBP. The term EBP readiness is a synonym for EBP competencies.

According to systematic reviews, nurses consider their attitudes towards EBP to be positive and their EBP knowledge and skills to be moderate. Nevertheless, this has not resulted in the successful implementation of EBP. Nurses are still more likely to base their decision-making related to patient care on information obtained through education, from coworkers and from care protocols, than from research knowledge, with the focus on maintaining high-quality patient care by implementing efficient work processes rather than obtaining evidence. Nurse managers consider their EBP competencies to be good, but their research and development competencies to be poor. In addition to EBP readiness, managers and nurses need support and resources at an organizational level in order to implement EBP. Organizations need to value EBP and include it in their strategic planning, providing access to relevant research and experts in EBP, budgetary resources

1Hospital District of Helsinki and Uusimaa (HUS), HUS Akuutti, Finland 2Department of Nursing Science, University of Eastern Finland, Kuopio, Finland 3Department of Education, University of Stockholm, Sweden

Corresponding author:
Anne Lunden, University of Eastern Finland, Department of Nursing Science, Yliopistonranta 1, FIN – 70211 Kuopio, Finland.
Email: anne.lunden2@gmail.com
for EBP and EBP education. In healthcare units identified as attractive to nurses, transformational managerial leadership has been used to promote a positive attitude towards research knowledge and strengthen sustainability in EBP implementation. Successful nurse managers have supported the emergence of an operational culture favorable to EBP, and have created strategies and participatory structures related to EBP implementation, while also improving the smooth running of related processes.

According to a systematic review by Birken et al., nurse managers fulfill five roles in promoting EBP: disseminating information; synthesizing information; mediating between strategy and day-to-day activities; promoting EBP implementation; and creating an innovative working environment. Effective leaders listen to nurses’ ideas and remove barriers to the implementation of EBP, as well as authorizing and mentoring the nurses. Managers can engage nurses in EBP implementation through good preparation and by educating and encouraging employees. According to Caramanica and Spiva, training can be used to strengthen the roles of nurse managers in highlighting the value of EBP, envisioning and ensuring its use, and providing sufficient resources for EBP.

Evidence-based practice is a key facet of knowledge management (KM) in healthcare. Both EBP and KM have the same underlying principles for enhancing competencies: learning to apply new knowledge and innovation within organizations collaboratively. The challenges to KM are similar to those affecting EBP implementation, including a lack of allocated time and human resources, and a lack of support for KM and EBP by management and at an organizational level. Knowledge management includes organizing the acquisition and sharing of knowledge, and generating new knowledge and putting it into use effectively. Knowledge is perceived as an intangible resource of individuals and organizations that increases productivity and profitability and facilitates operational reviews. Issues important to KM include creating an operational culture that promotes learning, with interaction between the patients and healthcare staff. While, in the context of nursing, it has been recognized that KM involves renewing knowledge, to date the emphasis has been on running day-to-day activities. As a result, promoting competency and anticipating competency requirements have been perceived as secondary priorities. Nurse managers consider their current opportunities for knowledge and EBP leadership as insufficient and the availability of research evidence for KM and EBP leadership within nursing remains limited.

Aims
The aims of this study were to describe and explain nurses’ perceptions of their readiness for EBP and their perceptions of managerial and organizational support in enhancing competency and EBP. Four research questions were asked.

1. How did the nurses assess their EBP, their attitudes towards EBP, and their EBP knowledge and skills?
2. How did the nurses perceive the managerial and organizational support for EBP?
3. How did the nurses perceive their managers’ activities in promoting their competencies and development opportunities related to their competencies?
4. What relationship was there between knowledge and EBP leadership and the nurses’ EBP readiness?

Methods and design
The study was performed using a cross-sectional survey design in accordance with the checklist ‘Strengthening the reporting of observational studies in epidemiology statement’ (STROBE) (see online supplementary material).

Setting and sample
The focus of the research was nurses (N = 695) who worked in 24-hour care units (N = 12) for one of Finland’s biggest public primary healthcare organizations (with more than 15,000 employees). The units provided care for adult patients with general internal diseases and for elderly people. The units included emergency and acute care units and sheltered homes. Information about the study was provided at meetings and a training event for nurse directors. The directors were sent links to the questionnaire and related information sheets; they then forwarded the material to nurse managers, who submitted them to the nurses.

Data collection and instruments
Data collection was based on electronic and paper questionnaires disseminated between 5 February and 26 March 2018. The survey included three instruments: two international instruments (the Evidence-Based Practice Questionnaire (EBPQ) and the EBP Nursing Leadership and Work Environment Scale), which had been previously tested and found to be reliable, and the Knowledge Management Questionnaire for Nurses (KMQN), which had been developed for this study. A back-translation procedure into Finnish was used for the international instruments, and they were piloted with managers participating in supplementary training in EBP (N = 21).

Responses to the questionnaires were sent directly to the researcher. Even though the response period was extended three times, overall only 125 questionnaires were returned, representing a response rate of 18% (N = 695). After reminders, 50 questionnaires were returned. According to a power analysis (Raosoft sample size calculator), with a margin of error of 0.5%, the sample size should have been twice that.

Evidence-Based Practice Questionnaire
The EBPQ is a self-reporting questionnaire that measures nurses’ daily use of EBP (six items) and attitude towards EBP (four items), and the knowledge and skills associated with EBP (14 items). The 24 EBPQ items are measured on
a scale of 1 to 7 (from never to always regarding the use of EBP and attitude), and from poor to best regarding EBP knowledge and skills). The questionnaire has a robust validity and an internal reliability Cronbach’s $\alpha$ value of 0.87. For the Finnish version, questions concerning attitudes were changed to incorporate a positive direction, to match other questions included in the survey.

**The EBP Nursing Leadership and Work Environment Scale**

The EBP Nursing Leadership and Work Environment Scale comprises 18 items, ranked on a scale from 1 (strongly disagree) to 5 (strongly agree). The scale examines nurses’ perceptions of the support for EBP provided by managers (10 items) and organizational support for EBP (eight items). The questionnaire has a robust internal reliability, with a Cronbach’s $\alpha$ value of 0.96 for the EBP Nursing Leadership scale, and 0.86 for the EBP Work Environment Scale.

**Knowledge Management Questionnaire for Nurses**

The KMQN was developed for this study based on a systematic review and an interview study. The face validity was tested by an expert panel and two authors (AL, AHL), and piloted with six registered nurses (RNs). The questionnaire included 12 items related to KM and 10 items related to enhancing competency. All items were scored on a scale of 1 to 7 (from never to always).

A principal component analysis (PCA) of the 12 KM items generated one component, and of the 10 nurses’ competency enhancement items generated three components. Based on the PCA, four mean scores were therefore calculated, one for each sub-category. The possible mean scores ranged from 1 (lowest) to 7 (highest). The normality of the distributions of these mean scores was tested using the Kolmogorov–Smirnov test. As many of them were not normally distributed, a nonparametric Kruskal–Wallis test was used for data analysis.

As the Kaiser–Meyer–Olkin test value for the ‘transformational KM’ sub-category was good (0.912) and the Bartlett’s test of sphericity significant ($p < 0.000$), the PCA was deemed suitable for these items. The Kaiser–Meyer–Olkin test value for the ‘nurses’ competency enhancement’ sub-category was also good (0.789) and the Bartlett’s test of sphericity significant ($p < 0.000$). Therefore, the correlation matrix fit the main component analysis. Variable loads were reasonably high, in the range of 0.823–0.583 for the ‘transformational KM’ sub-category, and 0.422–0.753 for the ‘nurses’ competency enhancement’ sub-category. ‘Transformational KM’ emerged as the main component, with an eigenvalue over 1.0, on which all of the ‘KM’ variables were loaded, explaining 60% of the variance. This main component was reliable and consistent (Cronbach’s $\alpha$ 0.957). The eigenvalue of the three main components (nurses’ participation in enhancing competency, Cronbach’s $\alpha$ 0.854; nurses’ responsibility in enhancing competency, Cronbach’s $\alpha$ 0.607; managers’ responsibility in enhancing competency, Cronbach’s $\alpha$ 0.266) on which all the sum variables were loaded was over 1.0, and they explained 61% of the variance.

**Data analysis**

The data were analyzed by descriptive statistics using the statistical software SPSS version 25 (IBM Inc., Chicago, IL, USA). Mean scores were calculated for sum variables, and the Kruskal–Wallis test, PCA and linear regression analysis were applied. To explore EBP leadership and the work environment and transformational KM, the nurses’ daily use of EBP and attitude towards EBP and associated knowledge and skills were used as factors explaining the nurses’ readiness. As a result, the variables ‘nurses’ daily use of EBP’, ‘attitude towards EBP’ and ‘knowledge and skills associated with EBP’ were combined to form a single sum variable ‘nurses’ readiness for EBP’. This was investigated with linear regression analysis using the ENTER method.

**Ethical considerations**

The study was conducted following the guidelines of the Declaration of Helsinki and the Finnish National Board on Research Integrity. The primary healthcare organization granted a research permit for the study. According to Finnish research practice, the approval of an ethics committee was not required. Permits for using the instruments were obtained from their developers. The study participants were provided with written letters or emails that included information about the study, ensuring the voluntary nature of participation. Completing and returning the questionnaires was considered as consent to participate, and data privacy was respected. The questionnaire did not include any identifying participant data, the data were kept in locked files, and only researchers had access to the material. The results were reported in a manner making it impossible to identify individual respondents.

**Results**

**Participant characteristics**

The respondents ($N = 125$, 18%) were registered nurses who held an RN degree (28.8%), a master’s or bachelor’s degree from a university (16.8%), or a bachelor’s or master’s degree from a university of applied sciences (53.6%). The nurses had graduated from an RN degree during the period 1974–2017 (median: 2001), or with a bachelor’s or master’s degree during the period 1976–2018 (median: 2009). The nurses were working within emergency services, acute care units and shelter homes, and had worked as nurses for at least 1 year and up to 42 years (with an average of 17 years in service). The youngest nurse was 23 and the oldest 63 years old (with an average age of 44 years).
Nurses’ perceptions of their EBP readiness

More than half of the nurses often assessed the results of their own activities (58.9%) and shared knowledge with their coworkers (58.5%). Fewer nurses reported often using evidence in their work (41.5%). Only 29.0% of the respondents often looked for evidence, 33.9% directly addressed a research question, and 20.5% critically analyzed evidence. More than half of the nurses reported that they often changed their activities based on evidence (51.6%) and considered this an essential part of their profession (62.9%). However, they only rarely considered new evidence so important that they made room for it in their work schedule (64.5%). Many of the nurses welcomed questions concerning their activities (77.4%). The majority considered their ability to evaluate their activities (83.7%) and identify development needs within their professional activities (82.3%) as their best skills. A large proportion of the nurses also rated their IT skills (73.4%), sharing ideas and knowledge with their coworkers (79.7%) and monitoring and assessing practice (74.2%) as good. They considered their research skills (48.4%) and their ability to convert their information needs into a research question (48.4%) as their weakest skills. They found their ability to examine evidence critically with the help of assessment criteria (50.8%) and their awareness of major information types and sources (46.8%) to be moderate (Table 1).

Nurses’ perceptions of EBP within the leadership and work environment

About half of the nurses agreed with the view that their managers reviewed practice in response to evidence (50.4%) and were able to communicate the importance of EBP (50.0%). Less than half (43.1%) felt that their nurse managers were able to explain EBP content. Only 39.8% agreed with the statement that their nurse manager facilitated changing practice to become based on evidence; a similar number (35.0%) expressed no opinion on the matter. Nearly half of the nurses expressed neither agreement nor disagreement with their managers’ ability to influence others to engage in EBP (46.8%) or to encourage nurses to examine evidence to guide their clinical practice.

Table 1. The practice, attitudes, knowledge and skills associated with evidence-based practice (EBP).

| Item | N  | Mean | SD | %   | %     | %     |
|------|----|------|----|-----|-------|-------|
| The practice of EBP. How often have you: |    |      |    |     |       |       |
| shared this information with colleagues? | 123 | 4.69 | 1.27 | 11.4 | 30.1  | 58.5  |
| evaluated the outcomes of your practice? | 124 | 4.58 | 1.23 | 16.9 | 24.2  | 58.9  |
| integrated the evidence you have found with your expertise? | 123 | 4.16 | 1.35 | 22.8 | 35.8  | 41.5  |
| formulated a clearly answerable question as the beginning of the process towards filling this gap? | 124 | 4.02 | 1.22 | 21.8 | 44.4  | 33.9  |
| tracked down the relevant evidence once you have formulated the question? | 124 | 3.95 | 1.20 | 24.2 | 46.8  | 29.0  |
| critically appraised, against set criteria, any literature you have discovered? | 122 | 3.41 | 1.38 | 49.2 | 30.3  | 20.5  |

| Nurses’ attitudes towards EBP |    |      |    |     |       |       |
| I will gladly welcome questions about my activities* | 124 | 5.13 | 1.10 | 5.6  | 16.9  | 77.4  |
| EBP is an essential part of my professional activities* | 124 | 4.85 | 1.30 | 12.9 | 24.2  | 62.9  |
| My activities have changed as a result of the evidence I have found* | 124 | 4.52 | 1.23 | 20.2 | 28.2  | 51.6  |
| New evidence is so important that I reserve time for it in my work schedule* | 124 | 2.98 | 1.29 | 64.5 | 25.0  | 10.5  |

| The knowledge and skills associated with EBP |    |      |    |     |       |       |
| Ability to review your own practice | 123 | 5.37 | 1.00 | 5.7  | 10.6  | 83.7  |
| Ability to identify gaps in your professional practice | 124 | 5.37 | 1.04 | 5.6  | 12.1  | 82.3  |
| Sharing of ideas and information with colleague | 123 | 5.23 | 1.11 | 8.9  | 11.4  | 79.7  |
| IT skills | 124 | 5.12 | 1.26 | 12.1 | 14.5  | 73.4  |
| Dissemination of new ideas about care to colleagues | 124 | 5.04 | 1.18 | 12.1 | 12.9  | 75.0  |
| Monitoring and reviewing of practice skills | 124 | 5.02 | 1.13 | 10.5 | 15.3  | 74.2  |
| Ability to apply information to individual cases | 124 | 4.89 | 1.09 | 9.7  | 25.0  | 65.3  |
| Ability to determine how useful the material is | 124 | 4.74 | 1.20 | 13.7 | 26.6  | 59.7  |
| Knowledge of how to retrieve evidence | 123 | 4.72 | 1.27 | 16.3 | 23.6  | 60.2  |
| Ability to determine how valid the material is | 124 | 4.57 | 1.31 | 18.5 | 28.2  | 53.2  |
| Ability to critically analyze evidence against set standards | 124 | 4.48 | 1.27 | 21.8 | 27.4  | 50.8  |
| Awareness of major information types and sources | 124 | 4.42 | 1.22 | 21.8 | 31.5  | 46.8  |
| Converting your information needs into a research question | 124 | 4.41 | 1.24 | 23.4 | 28.2  | 48.4  |

*In the Finnish version of the questionnaire, the questions have been changed to match the direction of the other questions in the survey.
decision-making (37.9%). Nearly a third (27.4%) of the respondents disagreed with the statement that their managers encouraged them in this context. The nurses considered the managers’ weakest skills to be providing resources and solving problems. Of the respondents, 30.6% disagreed, and 40.3% neither agreed nor disagreed, with the statement concerning their managers’ support of using databases, experts and literature. Similarly, of the respondents 43.3% disagreed, and 40.7% neither agreed nor disagreed, with the statement concerning their managers’ support of reserving time for EBP. About a third (33.3%) of the nurses disagreed and less than half (41.5%) neither agreed nor disagreed with the statement concerning receiving support from their managers in this context (Table 2).

More than half of the nurses agreed with the statement that their organization valued evidence-based nursing practice (68.3%), and that they had access to relevant databases (54.4%). However, their views of their managers’ activities were poorer: only 39.5% agreed that their managers made sure that they had access to relevant research, while 37.9% expressed no opinion on the matter. Only 36.1% of the respondents agreed that the staff at their unit based its activities on best evidence, and only 26.6% agreed that staff at their unit discussed research relevant to their clinical practice and that experts in EBP were available in their workplace (Table 2).

Table 2. The evidence-based practice (EBP) nursing leadership and work environment.

| Item                                                                 | N  | Mean | SD  | % Not agree | % Not agree or agree | % Agree |
|---------------------------------------------------------------------|----|------|-----|-------------|---------------------|--------|
| **The EBP leadership. My manager:**                                 |    |      |     |             |                     |        |
| is able to communicate how EBP is important for improving patient outcomes at my unit | 124 | 3.35 | 0.86 | 17.7         | 32.3                | 50.0   |
| supports my efforts to change practice in response to new knowledge/evidence | 124 | 3.32 | 1.04 | 23.6         | 26.0                | 50.4   |
| can explain EBP in terms that are easy to understand               | 123 | 3.27 | 0.92 | 19.5         | 37.4                | 43.1   |
| facilitates practice change based on relevant nursing research     | 123 | 3.16 | 0.94 | 25.2         | 35.0                | 39.8   |
| has a vision for EBP at my unit                                    | 122 | 3.10 | 0.97 | 27.0         | 38.5                | 34.5   |
| encourages me to examine evidence to guide clinical decision-making | 124 | 3.04 | 0.99 | 27.4         | 37.9                | 34.7   |
| is able to influence others to engage in EBP                       | 124 | 2.99 | 0.84 | 26.6         | 46.8                | 26.6   |
| facilitates my use of resources for EBP                            | 123 | 2.98 | 0.92 | 30.6         | 40.3                | 29.0   |
| helps me resolve conflicts between nursing research and clinical practice | 123 | 2.87 | 0.96 | 33.3         | 41.5                | 25.2   |
| provides time for me to engage in EBP                             | 123 | 2.61 | 1.00 | 43.3         | 40.7                | 17.1   |
| **The EBP work environment**                                       |    |      |     |             |                     |        |
| I believe my organization values EBP                               | 123 | 3.71 | 0.86 | 8.1          | 23.6                | 68.3   |
| I have access to databases that have full-length nursing research articles | 125 | 3.40 | 0.97 | 18.4         | 27.2                | 54.4   |
| My manager makes sure that I have access to relevant research       | 124 | 3.20 | 0.93 | 22.6         | 37.9                | 39.5   |
| My organization pays for me to attend educational offerings about EBP | 125 | 3.06 | 1.09 | 28.8         | 35.2                | 36.0   |
| The nurses at my unit base their practice on the best evidence      | 122 | 3.05 | 0.88 | 28.7         | 35.2                | 36.1   |
| The physicians I work with support EBP changes based on nursing research | 125 | 2.99 | 0.89 | 25.6         | 47.2                | 27.2   |
| The nurses at my unit discuss research relevant to our clinical practice | 124 | 2.72 | 1.07 | 44.4         | 29.0                | 26.6   |
| Experts in EBP are available                                       | 124 | 2.70 | 1.04 | 46.8         | 26.6                | 26.6   |

Nurses’ perceptions of KM and developing professional competency

Regarding KM, more than half of the nurses noted that their managers often showed that they valued their competency (66.1%), supported the development of competency (57.3%) and encouraged them to engage in experimentation (50.4%). However, only 39% reported that their managers often highlighted their competency. Nearly half (48.4%) of the nurses reported that their managers often supported the emergence of a culture promoting competency, and slightly less (47.2%) that their managers disseminated new knowledge and good practice in their units. Fewer respondents felt that their managers often ensured their competency (35.8%), anticipated competency needs (29.8%), intervened in inadequate competency (29.3%) and assessed competency (38.2%). Of the respondents, 79.8% felt that they were often able to utilize their competency, 55.7% that they demonstrated cooperation with colleagues, and 49.6% that they developed this together with other employees. Nearly all of the respondents (90.3%) reported that they were often personally responsible for their competency, and the majority considered that they had increased their competency during their professional career (87.7%) and were ready to experiment with new operational approaches (86.2%). However, only 37.1% of the respondents thought that their development ideas had been taken into consideration, and only 26.8%...
that their competency development needs were often addressed by their managers. Of the respondents, 37.9% felt that they occasionally and 11.3% that they often performed tasks in which their competency was insufficient (Table 3).

**The relationship of background variables to nurses’ perceptions of EBP readiness and KM**

While all of the background variables were related to the nurses’ views of EBP knowledge and skills, only age correlated with EBP leadership and transformational KM (Table 4). The nurses who had completed a master’s degree scored their EBP knowledge and skills higher (mean 5.57) than those with nursing qualifications from a university of applied sciences (mean 4.78) or a vocational college (mean 4.39). The respondents who had completed a master’s degree less than five years or 5–15 years ago scored their EBP knowledge and skills higher (mean 5.19 and 4.90, respectively) than those who had completed their degree more than 15 years ago (mean 4.36). Similarly, those who had graduated as nurses less than seven years ago scored their knowledge and skills higher (mean 5.12) compared with those who had graduated 7–21 (mean 4.70) or more than 22 (mean 4.68) years ago. The nurses who had less than eight years of experience in nursing scored their knowledge and skills higher (mean 5.12) than those who had been working in nursing for 8–21 (mean 4.67) or more than 22 years (mean 4.67). Nurses under 38 years of age scored their knowledge and skills as higher (mean 5.12) than those aged 38–51 (mean 4.61) or older than 51 (mean 4.71). Nurses more than 51 years old scored their EBP leadership skills higher (mean 3.44) than those aged 38–51 (mean 2.93) and younger than 38 (mean 2.82). Nurses older than 51 also scored their knowledge management higher (mean 4.66) than the nurses younger than 38 (mean 4.08) or aged 38–51 (mean 4.01).

**The relationship between KM and EBP leadership and nurses’ EBP readiness**

Nurses’ EBP and attitudes correlated moderately positively with their views of EBP leadership and the operational environment as well as their opportunities for competency development and their personal responsibility for competency development. The nurses’ perceptions of their knowledge and skills in EBP only had a moderately positive correlation with their views of the opportunities for developing their own competency. The factors explaining ‘nurses’ EBP readiness’ were EBP leadership ($\beta$ 0.373, 95% CI 0.113–0.633), and transformational KM ($\beta$ –0.084, 95% CI –0.268–0.101). Nurses’ EBP readiness was only explained by EBP leadership 6.50% ($p = 0.007$) (Table 5).

**Discussion**

The aim of this study was to describe and explain nurses’ perceptions of their readiness for EBP and their perceptions of managerial and organizational support in enhancing competency and EBP. While the research tradition

| Item                                                                 | N   | Mean | SD  | %    | %    | %    |
|----------------------------------------------------------------------|-----|------|-----|------|------|------|
| **Leader’s transformational agency in KM, Nurse manager:**           |     |      |     |      |      |      |
| values your competency                                              | 124 | 4.72 | 1.30| 14.5 | 19.4 | 66.1 |
| enables the development of your competency                           | 124 | 4.55 | 1.23| 16.1 | 26.6 | 57.3 |
| supports the development of your competency                          | 124 | 4.52 | 1.28| 17.7 | 25.0 | 57.3 |
| supports the emergence of an operating culture promoting development | 122 | 4.36 | 1.28| 18.9 | 32.8 | 48.4 |
| encourages the working community to engage in new experiments        | 123 | 4.35 | 1.37| 22.8 | 26.8 | 50.4 |
| encourages you to develop your competency                            | 121 | 4.31 | 1.40| 24.0 | 28.1 | 47.9 |
| disseminates new knowledge and good practices                        | 123 | 4.28 | 1.31| 22.8 | 30.1 | 47.2 |
| brings forth your competency                                         | 123 | 4.15 | 1.31| 26.0 | 35.0 | 39.0 |
| intervenes with deficiencies in competency detected                 | 123 | 4.08 | 1.41| 29.3 | 30.9 | 39.8 |
| assesses your competency                                             | 123 | 4.04 | 1.31| 26.8 | 35.0 | 38.2 |
| anticipates your competency needs                                    | 124 | 3.86 | 1.30| 29.8 | 37.1 | 33.1 |
| ensures your competency                                              | 123 | 3.82 | 1.35| 35.8 | 30.9 | 33.3 |
| **Opportunities for developing competency, To what extent:**          |     |      |     |      |      |      |
| can you utilize your competency in your work?                        | 124 | 5.10 | 0.92| 4.0  | 16.1 | 79.8 |
| can you demonstrate your competency in multiprofessional cooperation? | 122 | 4.65 | 1.07| 11.5 | 32.8 | 55.7 |
| can you develop your competency together with other employees?       | 121 | 4.42 | 1.04| 17.4 | 33.1 | 49.6 |
| have your development ideas been taken into consideration?           | 124 | 4.24 | 1.14| 21.0 | 41.9 | 37.1 |
| have you addressed your competency development needs to your manager?| 123 | 4.14 | 1.01| 18.7 | 54.5 | 26.8 |
| **Nurses’ responsibility in competency development, To what extent:**|     |      |     |      |      |      |
| are you responsible for your competency?                             | 123 | 5.96 | 1.08| 1.6  | 8.1  | 90.3 |
| are you ready to experiment with new working approaches?             | 123 | 5.46 | 0.98| 2.4  | 11.4 | 86.2 |
| have you developed your competency during your career?               | 122 | 5.46 | 0.96| 2.5  | 9.8  | 87.7 |
| **Nurse manager responsibility in competency development**          |     |      |     |      |      |      |
| To what extent is your nurse manager responsible for your competency?| 123 | 4.41 | 1.37| 22.0 | 29.3 | 48.8 |
| How often do you perform tasks in which your competency is insufficient? | 124 | 3.40 | 1.04| 50.7 | 37.9 | 11.3 |
concerning nurses’ views of EBP is long, there has been little research regarding their views about EBP leadership and KM at an organizational level. Our study helps fill that gap, and we have established a measurement for KM within nursing science that has been lacking until now.

Our results indicate that slightly less than half of the nurses reported that their practice was often evidence-based and even fewer had searched for evidence and then assessed it. Moreover, only a third of the respondents considered their colleagues’ activities to be evidence-based. Attitudes towards EBP of more than half of the nurses were positive, as found in previous studies.

There was a relationship between EBP knowledge and skills and a higher education degree and more recently completed nursing qualification, as also found in previous research. This can probably be explained by the previous focus of nursing education on practical expertise rather than the current focus on applying research knowledge. Based on these results, nurses’ educational background and qualification dates should be taken into account when planning supplementary EBP training.

The results regarding EBP readiness raise a question as to whether the nurses identified EBP content opportunities for participating correctly and understood what its implementation required of them. Previous studies have argued that nurses have a lack of understanding of EBP content and that their implementation abilities are poor. Nursing education should ensure that students have a clear understanding of EBP and its related requirements. This would also facilitate nurses’ critical assessment of their readiness, as assessment focused on EBP competencies has revealed poorer results for EBP knowledge and skills. Education must also equip nurses with the skills to use evidence in their decision-making processes concerning patients. Developing appropriate education and training will improve EBP in nursing by enhancing nurses’ motivation and efforts to improve their EBP competencies.

In the present study, more than half of the nurses felt that their organization had a positive attitude towards EBP. In contrast, only half or fewer had a positive opinion of their managers’ activities related to EBP. However, nearly half of the respondents expressed no opinion on several different statements. These results suggest that nurse managers continue to play an invisible and passive role in EBP. Managers need to understand the importance of their role and to work actively to remove barriers to EBP.

As in previous studies, the nurses considered their managers’ roles in arranging resources, solving problems and encouraging discussion about EBP as weak areas. This indicates that nurses need more concrete support from their managers in reviewing practices and implementing EBP. Organizations should promote strategies for acquiring research knowledge, improve the availability of

### Table 4. The relationships between background variables and sum variables.

| Sum variables                        | Highest degree (p) | Year of completing highest degree (p) | Year of completing nursing qualifications (p) | Experience in nursing (p) | Age (p) |
|--------------------------------------|--------------------|--------------------------------------|-----------------------------------------------|---------------------------|---------|
| EBP leadership (1–10)                | 0.600              | 0.785                                | 0.442                                         | 0.462                     | <0.001  |
| EBP work environment (11–18)         | 0.843              | 0.938                                | 0.549                                         | 0.568                     | 0.406   |
| Practice of EBP (19–24)              | 0.170              | 0.254                                | 0.350                                         | 0.460                     | 0.615   |
| Attitudes towards EBP (25–28)        | 0.130              | 0.323                                | 0.366                                         | 0.455                     | 0.387   |
| EBP knowledge and skills (29–42)     | <0.001             | <0.001                               | 0.019                                         | 0.009                     | 0.024   |
| Leader’s transformational agency in KM (43–54) | 0.376             | 0.660                                | 0.765                                         | 0.537                     | 0.010   |
| Competency utilization and development (55–64) | 0.903             | 0.860                                | 0.908                                         | 0.365                     | 0.596   |
| Opportunities for participation (61,56,62,55,60) | 0.783             | 0.983                                | 0.793                                         | 0.441                     | 0.428   |
| Personal responsibility (63,59,57)   | 0.514              | 0.398                                | 0.602                                         | 0.102                     | 0.597   |
| Leader’s responsibility (64,58)      | 0.414              | 0.780                                | 0.595                                         | 0.869                     | 0.712   |

Kruskall–Wallis test.
Note. p-value < 0.05
EBP: evidence-based practice; KM: knowledge management.

### Table 5. Nurses’ perceptions of their evidence-based practice (EBP) readiness and correlations with perceptions of EBP leadership and knowledge management (KM).

| Sum variables                        | Practice of EBP | Attitude towards EBP | Knowledge/skills with EBP |
|--------------------------------------|-----------------|----------------------|--------------------------|
| EBP leadership                       | 0.349**         | 0.344**              | 0.144                    |
| EBP work environment                 | 0.459**         | 0.373**              | 0.260**                  |
| Leader’s transformational agency in KM | 0.191*          | 0.224*               | 0.050                    |
| Possibilities to participate to competency development | 0.489**         | 0.455**              | 0.301**                  |
| Nurses responsibility to enhance competency | 0.319**         | 0.312**              | 0.209*                   |
| Leaders responsibility to enhance competency | 0.187*          | 0.035                | 0.115                    |

Pearson correlation.
*Correlation significant at the 0.05 level (two-tailed). **Correlation significant at the 0.01 level (two-tailed).
experts, and allocate time for EBP. Evidence-based practice experts and mentors should support nurse managers and nurses in solving conflicts between research knowledge and clinical practice. Key development areas in the work environment include more discussions about EBP and research findings essential to the unit. Joint discussion improves the inclusion of nursing staff in EBP and helps the nurses understand the relevance of EBP to their work.18,33

According to Caramanica and Spiva,15 training improves managers’ readiness to support nurses’ EBP and promote a supportive work environment. However, based on the results of this study, it appears that nurse manager education needs to be reformed. Increasing managers’ capabilities promotes an operational environment supporting EBP that, in turn, enhances the EBP implemented by the managers.37 In addition to training, nurse managers also need peer support and assistance from a strategic level in practical implementation.13

In the present study, half of the nurses were positive about their managers’ activities related to KM. The weakest areas identified were anticipation of nurses’ competency needs, ensuring and assessing competency, and intervening when inadequacies in competency were detected. There is an obvious need to develop these areas, as more than a third of the nurses reported that they occasionally performed tasks in which their competency was insufficient. While good instruments have been developed for the systematic assessment of competencies, these have been poorly deployed for management leadership.25,38 The results of this study indicate that the role of managers is as invisible in KM3,5 as it is in EBP. A study aimed at nurse managers17 revealed that their activities were more concerned with day-to-day competencies than long-term development and assessment of competency needs.

The nurses recognized their responsibilities for their own competencies even though they seldom addressed their competency needs and development ideas with their managers or supervisors. Only half of the nurses thought that their managers often supported the emergence of a culture promoting competency. Strengthening a participatory operational culture would encourage nurses to express their ideas for competency development. In fact, nurses’ positive views of their competency development and related opportunities for utilization should be considered as a KM resource that can be exploited.

**Limitations and strengths**

Managers were responsible for providing the nurses with the survey forms used for data collection. There may have been a delay in the dissemination of the survey because of the managers’ busy schedules. Several surveys were conducted within the units simultaneously, which may have meant there was insufficient time to answer them all. The response rate was low (18%, N = 125), which reduces the transferability and generality of these results to other organizations. According to the power analysis, the sample size should have been twice as big. The limitations of this study therefore include the fact that the number of respondents representing each unit was low, preventing group comparisons between units. However, a strength of this study is the fact that it was conducted in 12 different operating units within a large organization.

Another limitation might be that the nurses who chose to respond to the questionnaire could have been more interested in EBP than their peers. We have no information about the group that did not participate in the study. Two of the instruments have been used for a long time at an international level and are considered valid, and they produced good Cronbach’s alpha scores in this study. The KM instrument was developed specially for the present study; although it was found to be reliable, it should nonetheless be tested and developed further. The questionnaire required the nurses to assess their managers’ activities, which they might have found difficult. The fact that the results were based on the respondents’ self-assessment can be considered a limitation, but having the nurses assess their managers’ activities can also be perceived as a strength.

**Clinical implications**

In conclusion, the results indicate that nurses’ EBP readiness and use of evidence does not correspond with today’s requirements for EBP implementation. According to the nurses’ assessments, the managers’ roles in both EBP leadership and KM are invisible. While the nurses understand their own responsibilities in the development of their professional competencies including EBP readiness, they consider the opportunities for participating in related development within their working units as poor. These results emphasize the need to develop nurse training, management leadership and an operational environment conducive for EBP and KM. In addition to a strategy at an organizational level, working communities need to be developed, and a collaborative relationship between employees and employers encouraged. These developmental activities must be supported by implementation studies based on a multifaceted assessment of the work carried out at the different levels within an organization. Managers should take a more visible role in mentoring nurses for EBP and in identifying the developmental needs of nurses’ competencies. The managers themselves require peer support and opportunities for collaborative learning in order to clarify their roles.

**Ethical approval**

Ethical approval was not required.

**Author contributions**

AL, AHL, TK, MT were responsible for the conception and design of the study. AL carried out the data collection. AL, AHL, TK performed the data analysis. AL, AHL were responsible for drafting the manuscript. AHL, TK, MT made critical revisions to the paper. AL, AHL obtained funding. AHL, TK, MT supervised the study.
Conflict of interest
The authors declare that there is no conflict of interest.

Funding
The research was funded by The Finnish Nurses Association, Akava Association of Nurses and Health Science Academic Leaders and Experts Taja, The City of Helsinki’s Social and Health Services, and Government Grants for health science research, Nursing Research Center, University of Helsinki and Helsinki University Hospital.

ORCID iD
Anne Lunden https://orcid.org/0000-0002-0964-9127

Supplementary material
Supplementary material is available online with the article.

References
1. Birken S, Clary A, Tabriz AA, et al. Middle managers’ role in implementing evidence-based practices in health care: a systematic review. Impl Sci 2018; 13: 1–14.
2. Carlson CL and Plonczynski DJ. Has the BARRIERS Scale changed nursing practice? An integrative review. J Adv Nurs 2008; 63: 322–333.
3. Saunders H and Vehviläinen-Julkunen K. The state of readiness for evidence-based practice among nurses: an integrative review. Int J Nurs Stud 2015; 59: 128–140.
4. Melnyk BM, Gallagher-Ford L, Zellefrow C, et al. The first US study on nurses’ evidence-based practice competencies indicates major deficits that threaten healthcare quality, safety, and patient outcomes. Worldviews Evid Based Nurs 2018; 15: 16–25.
5. Harper MG, Gallagher-Ford L, Warren JI, et al. Evidence-based practice and US healthcare outcomes: findings from a national survey with nursing professional development practitioners. J Nurses Profess Dev 2017; 33: 170–179.
6. Institute of Medicine. Health professions education: a bridge to quality. Washington, DC: The National Academies Press, 2003.
7. Saunders H, Gallagher-Ford L, Kvist T and Vehviläinen-Julkunen K. Practicing healthcare professionals’ evidence-based practice competencies: an overview of systematic reviews. Worldviews Evid Based Nurs 2019; 3: 176–185.
8. Saunders H and Vehviläinen-Julkunen K. Evidence-based practice and job-related nurse outcomes at Magnet®: aspirational, Magnet-conforming, and non-Magnet university hospitals in Finland. J Nurs Adm 2016; 10: 513–520.
9. Renolen Å, Höye S, Hjälmhult E, et al. ‘Keeping on track’—Hospital nurses’ struggles with maintaining workflow while seeking to integrate evidence-based practice into their daily work: a grounded theory study. Int J Nurs Stud 2018; 77: 179–188.
10. Shuman CI, Liu X, Aebersold ML, et al. Associations among unit leadership and unit climates for implementation in acute care: a cross-sectional study. Impl Sci 2018; 13(62).
11. Lehtonen MR, Kantanen K and Suominen T. International nursing: nurse managers’ leadership and management competencies assessed by nursing personnel in a Finnish hospital. Nurs Admin Q 2018; 42: 164–174.
12. Pryse Y, McDaniel A and Schafer J. Psychometric analysis of two new scales: the Evidence-Based Practice Nursing Leadership and Work Environment Scales. Worldviews Evid Based Nurs 2014; 11: 240–247.
13. Bianchi M, Bagnasco A and Bressan V. A review of the role of nurse leadership in promoting and sustaining evidence-based practice. J Nurs Manage 2018; 26: 918–932.
14. Kutney-Lee A, Stimpfel AW, Sloane DM, et al. Changes in patient and nurse outcomes associated with magnet hospital recognition. Med Care 2015; 53: 550–557.
15. Caramanica L and Spiva L. Exploring nurse manager support of evidence-based practice. J Nurs Adm 2017; 48: 272–278.
16. Sibulsl, Watthen CN and Kothari A. An empirically based model for knowledge management in health care organizations. Health Care Manage Rev 2016; 41: 64–74.
17. Lunden A, Teräs M, Kvist T, et al. Transformative agency and tensions in knowledge management – A qualitative interview study for nurse leaders. J Clin Nurs 2018; 1–11.
18. Renolen Å, Höye S, Hjälmhult E, et al. Evidence-based practice integration in hospital wards: the complexities and challenges in achieving evidence-based practice in clinical nursing. Nursing Open 2019; 6: 815–823.
19. Grant RM. Reflections on knowledge-based approaches to the organization of production. J Manage Govern 2013; 17: 541–558.
20. Alavi M and Leidner DE. Review: Knowledge management and knowledge management systems: conceptual foundations and research issues. MIS Q 2001; 25: 107–136.
21. Karamitri I, Talias MA and Bellali T. Knowledge management practices in health care settings: a systematic review. Int J Health Plann Manage 2017; 32: 4–18.
22. Lunden A, Teräs M, Kvist T, et al. Nurse leaders’ perceptions and experiences of leading evidence: A qualitative enquiry. J Nurs Manage 2019; 1–10.
23. von Elm E, Altman DG, Egger M, et al. The strengthening the reporting of observational studies in epidemiology (STROBE) statement: guidelines for reporting observational studies. J Clin Epidemiol 2008; 61(4): 344–349.
24. Upton DR and Upton PM. Development of an evidence-based practice questionnaire for nurses. J Adv Nurs 2006; 53: 454–458.
25. Ervasti T. Evaluation of supplemental training to promote evidence based practice: survey for the participants. University of Eastern Finland, Faculty of Health Sciences. http://epubli caations.uef.fi/pub/urn_nbn_fi_urn_nbn_fi_20171289/urn_nbn_fi_urn _nbn_fi_20171289.pdf (2017, accessed 23 June 2020).
26. Lunden A, Teräs M, Kvist T, et al. A systematic review of factors influencing knowledge management and the nurse leaders’ role. J Nurs Manage 2017; 25: 407–420.
27. Politi DF and Beck CT. Essentials of nursing research: appraising evidence for nursing practice. 9th ed. Philadelphia, PA: Wolters Kluwer, 2018.
28. Field A. Discovering statistics using IBM SPSS statistics. 5th ed. Germany: Mohn Media, 2018.
29. World Medical Association. Declaration of Helsinki: ethical principles for medical research involving human subjects, https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/ (2018, accessed 13 October 2020).
30. Finnish National Board on Research Integrity. The ethical principles of research with human participants and ethical review in the human sciences in Finland, https://www.tenk.fi/en/ethical-review-in-human-sciences (2018, accessed 11 June 2020).
31. Wilson M, Sleutel M, Newcomb P, et al. Empowering nurses with evidence-based practice environments: surveying Magnet®, Pathway to Excellence®, and non-Magnet facilities in one healthcare system. *Worldviews Evid Based Nurs* 2015; 12: 12–21.

32. Schaefer JD and Welton JM. Evidence based practice readiness: A concept analysis. *J Nurs Manag* 2018; 26: 621–629.

33. Karlsson A, Lindeborg P, Gunningberg L and Jangland E. Evidence-based nursing: how is it understood by bedside nurses? A phenomenographic study in surgical settings. *J Nurs Manag* 2019; 27: 1216–1223.

34. Skela-Savić B, Hvalić-Touzery S and Pesjak K. Professional values and competencies as explanatory factors for the use of evidence-based practice in nursing. *J Adv Nurs* 2017; 73: 1910–1923.

35. Malik G, McKenna L and Plummer V. Perceived knowledge, skills, attitude and contextual factors affecting evidence-based practice among nurse educators, clinical coaches and nurse specialists. *Int J Nurs Pract* 2015; 21: 46–57.

36. Melnyk BM, Gallagher-Ford L, Thomas BK, et al. Study of chief nurse executives indicates low prioritization of evidence-based practice and shortcomings in hospital performance metrics across the United States. *Worldviews Evid Based Nurs* 2016; 13: 6–14.

37. Chen L, Wu Y, Zhou C, et al. Value, knowledge and implementation on evidence-based practice among nurse managers in china: A regional cross-sectional survey. *J Nurs Manag* 2020; 28: 139–147.

38. Liu Y and Aungsuroch Y. Current literature review of registered nurses’ competency in the global community. *J Nurs Scholarship* 2018; 50: 191–199.