

Development and psychometric evaluation of nurses' perception towards the gap between knowledge and practice

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Abstract

Aim: The aim of the study was to develop a survey instrument and psychometrically evaluate nurses' perceptions of the gap between knowledge and practice. Although the nursing literature has widely documented a gap between knowledge and practice, no instrument has been developed to measure this gap.

Design: Psychometric analysis was done on 513 nurses working in different positions at two large hospitals in Jeddah City.

Methods: Cronbach's alpha was used to determine the internal consistency and reliability of the research instrument, and a panel of experts evaluated the validity of the tool's content.

Result: The content validity index computed from expert rankings was 0.89. Factor analysis yielded four major components: knowledge, practice, environment and learning. Cronbach's alpha indicated a high level of internal consistency and reliability for the component items. The newly developed scale will facilitate measuring nurses' perceptions of the knowledge–practice gap in clinical settings.

KEYWORDS

clinical settings, factors, instrument development, integration, knowledge practice gap, learning, nurse, nursing knowledge, nursing practice, scale measurement

1 | INTRODUCTION

The knowledge–practice gap is significant for in the field of nursing field because theoretical knowledge guides and supports nursing practice, which provides the best patient care possible and maximizes patient safety based on rigorous scientific evidence (Saifan et al., 2021). Furthermore, evidence-based practice improves the patient experience and increases patient satisfaction (Carlone & Igbirieh, 2014; Skaggs et al., 2018). The knowledge–practice gap refers to the discrepancy between theoretical information and its implementation in practice (Westerlund et al., 2019). Unquestionably, the gap between theory and practice is increasing in the field of

nursing and this is considered a challenge that obstructs the growth of the nursing profession (Safazadeh et al., 2018). Without understanding the root of the knowledge–practice gap, it will not be possible to devise strategies to bridge the gap and fulfil changing health needs (Shoghi et al., 2019). Additionally, acknowledging this issue aids in providing strategies to improve nurses' knowledge of research and develop evidence-based practice skills (Hickman et al., 2018).

In a qualitative study, Salifu et al. (2019) reported that nurses faced difficulty in pursuing learning as a result of organizational expectations for them to carry out daily routines. Further, one of the contributing causes of the knowledge–practice gap is the absence of the involvement of nurses in making clinical judgements

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and participating in the decision-making process. Insufficient organizational support also plays an essential role, as lack of learning opportunities and absence of internal educational sessions can inhibit nurses' motivation to apply evidence based practice (Hweidi et al., 2017). This reflects on the organization's role in supporting nurses' education and professional growth. In this context, one recent integrative review exploring factors contributing to the knowledge-practice gap revealed that organizational characteristics such as resources and staffing can positively contribute to the knowledge-practice gap since the unavailability of resources leads nurses to deviate from ideal, evidence-based performance. Similarly, an inappropriate nurse-to-patient ratio leads nurses to neglect ideal practices due to the patient overload (Gassas, 2021). A study done in China examined the factors influencing the implementation of evidence-based knowledge and reported that the application of evidence-based knowledge varied with the nature of the problem and with how commonly it was faced, along with the feasibility and effectiveness of applying the evidence-based knowledge. Moreover, nurses' internal motivation was the driver in their seeking to apply evidence-based knowledge and grow professionally (Cheng et al., 2017). Knowledge gives nurses the ability to make significant clinical decisions in patient care, which can save patients' lives (Rega et al., 2017). Harley et al. (2019) conducted a study to assess emergency nurses' knowledge about sepsis and reported that nurses' knowledge about sepsis is deficient in several respects. For example, some participants failed to identify the correct tool to assess sepsis. In addition, participants' definitions and recognition of sepsis symptoms failed to adhere to the international guidelines. This kind of knowledge deficit and variation affects patient care negatively, especially in situations where rapid and accurate interventions are required. Another study, which measured nurses' knowledge and practice in relation to chemotherapy-induced peripheral neuropathy (CINP), reported that nurses suffered from knowledge deficits and low confidence in assessing neurological symptoms and admitted that their skills were inadequate to perform the assessment. However, the study also found a strong association between higher education and knowledge of CINP (Al-Atiyyat & Banifawaz, 2018). Beyond these examples, nurses' knowledge of pharmacology and medication administration is crucial for patients' safety (Gregory et al., 2009; Jones & Treiber, 2010). Gracia et al. (2019) discovered that drug knowledge levels were poor among critical care unit nurses, revealing that 42.5% of the research sample failed the assessment on drugs. Knowledge gaps related to the preparation and administration of insulin were the most prevalent, accounting for 92.5% of the errors.

The knowledge-practice gap has other negative effects, such as increased nurse anxiety, which in turn lead to an inability to optimize the care provided (Roshan Essani & Ali, 2011). Another adverse effect of the knowledge-practice gap is questioning of nurses' credibility and ability to give quality care (Ajani & Moez, 2011), which affects the nursing profession and inhibits appropriate branding of the nursing career. The perceived lack of clinical knowledge and of

confidence in making decisions and managing clinical situations has been proven to lead newly qualified nurses to leave the profession (Lopez et al., 2018; Phillips, 2017).

2 | BACKGROUND

Knowing the rationale for intervention and basing one's practice on up-to-date evidence are the keys to safe, high-quality practice (Rolfe, 2013). The question that arises is what prevents nurses from advancing their knowledge and practice skills. The literature acknowledges that knowledge is essential for advancing practice; yet, a unique pattern is still required to intervene and judge complex situations requiring the integration of updated knowledge and previously learned skills. Arguably, advancement in practice-based knowledge may be individualistic because it is a continuous process (Christensen, 2011). This fact leads directly to the typology of knowledge developed by Rolfe (1998), who emphasized first on scientific knowledge (e.g., the information in books or journals), then experiential knowledge (obtained through actual exposure) and personal knowledge (gained by dealing with an uncommon situation or people), which collectively enable nurses to acquire information from a variety of sources in order to give optimum care and make the best clinical decisions. Rolfe (1998) promoted a view of knowledge that envisioned a combination of empirical and theoretical knowledge. Wilson-Barnett et al. (2000) carried out an observational study, which concluded that personal characteristics, such as commitment, confidence and problem-solving, are essential for remaining active learners.

Donohue et al. (2011) asserted that nurturing and developing the ability to read, analyze, evaluate and understand a medical situation is essential for providing and crucially improving care. For nurses, these skills are both vital and highly needed. Similarly, Hatlevik (2012) observed nurses' daily comprehension levels in practice about pathophysiology, pharmacology and the reasons for medical interventions. From these observations, it was noted that many nurses carried out physicians' orders and instructions without deep comprehension of the whys and wherefores. These observations led to the conclusion that poor reading skills were a major factor leading to the knowledge-practice gap, as extensive reading was required for research and application of nursing knowledge.

It is evident that there are many factors leading to the knowledge-practice gap (Gassas, 2021). Therefore, to increase the understanding of effective implementation strategies to bridge the knowledge-practice gap, it is useful to develop a valid, pragmatic and psychometrically robust tool that can identify the most relevant factors contributing to the gap according to each organization's unique characteristics (Lewis et al., 2015; Martinez et al., 2014). Since there is no other tool currently available to assess the knowledge-practice gap in nursing, this study seeks to develop a survey instrument and psychometrically evaluate nurses' perceptions of the gap between knowledge and practice.

3 | DESIGN

A psychometric approach was selected for analysis. Factor analysis and principal component analysis (PCA) were employed to evaluate the data and to analyze their psychometric properties. Factor analysis is of two types: confirmatory and exploratory. Exploratory factor analysis was selected because it is a statistical technique for determining the underlying structure of a large number of variables. In addition, it is used when the aim of the study is to determine the number of common factors and their loading pattern (Norris & Lecavalier, 2010). Meanwhile, PCA is a technique that reduces the complexity of high-dimensional data while preserving trends and patterns, by condensing the data into a smaller number of dimensions that serve as feature summaries (Lever et al., 2017).

4 | METHODS

The questionnaire consisted of two parts. The first part was concerned with demographic variables, which included gender, experience, educational level, current position and whether the respondent had attended a workshop about research. This last variable was included to assess participants' familiarity with the conduct and use of research, particularly since nurses come from a variety of nations with varying degrees of education and may not have experienced curricula that included nursing research. The second part measured nurses' perceptions of the gap between knowledge and practice. This part, which was based on an extensive literature review, comprised three domains: nurse, environment and organization. Thirty-seven items were initially developed and written as closed-ended declarative statements using a 5-point Likert scale (5 = Strongly agree, 4 = Agree, 3 = Neither agree nor disagree, 2 = Strongly disagree and 1 = Disagree). The 5-point Likert scale was selected to give a wide range of choices and to enhance variability. Furthermore, the use of an odd number allows for a neutral response (Polit & Beck, 2017).

The items were then evaluated in a single session by a panel of nursing experts. The members were chosen based on their background, expertise and familiarity with the target population. The members comprised one faculty member who specialized in nursing education, one expert who was a director of nursing research and one expert who was the nursing director of medical units at a university hospital. All three members had earned a master's degree in nursing. Each item was evaluated by the members individually for relevance, comprehension, readability and clarity.

The ratings for the tool were as follows: 1 = Not relevant, 2 = Somewhat relevant, 3 = Quite relevant and 4 = Highly relevant. Next, a formula was used to assess the agreement among the experts. An item-level content validity index (ICVI) was used, and its result was 0.89. No changes were made to the scale.

4.1 | Pilot study

The tool was also given to 30 staff nurses from the target population, who were asked about clarity, language, wording, interpretation of the items, the relevance of the tool and the time required to complete the survey. Following Polit and Beck's (2017) suggestions, the aim was to look for items with high non-response rates, limited variability or numerous midpoint responses. No modifications were made as a result of this process. Cronbach's alpha for the tool was 0.88, which reflects the items' high intercorrelation and internal consistency.

4.2 | Sample

Effective testing on a new scale can be achieved with a large sample size from the target population to ensure representation and it allows for complex statistical analyses. According to Polit and Beck's (2017) recommendation, a sampling of three to four participants per item is adequate for a representative sample, even though 10 participants per item are preferable. In comparison, Nunnally and Bernstein (1994) suggested that 300 would be an adequate number to support factor analysis. Based on the references, the researcher was aiming to collect 300 participants for a representative sample. Six hundred questionnaires were distributed, and 513 were returned. The samples collected for factor analysis in this study numbered 513, which exceeds 10 participants per item. The value of the Kaiser-Meier-Olkin measure of sample adequacy was calculated at 0.946 (p -value .001), indicating the adequacy of the sample size used in the analysis.

4.3 | Data collection

Data were collected from two major hospitals in Jeddah; the King Fahad General Hospital (KFH) and King Abdulaziz Hospital-Al Mahjar (KAH). These two hospitals were selected based on their bed capacity, skill mix, the number of nursing staff and the staff's mix of educational and ethnic backgrounds along with the variety of their respective medical specialities. These hospitals are two of the oldest in the city of Jeddah. KFH was established in 1979 and KAH in 1983; both represent health services provided by the Ministry of Health (MOH). Table 1 presents the basic characteristics of the respondents. Out of the 513 participants, 92.4% were female and 215 of the participants had 5–9 years of work experience. Although most respondents had a bachelor's degree, seven reported having earned a master's or higher educational degree. Out of all respondents, 197 had attended at least one workshop in the course of their job. Staff nurses represented 91.4% of all individuals included in the study sample, and 22 respondents were nurse managers. The selected sample is representative of the current nursing workforce in the Kingdom of Saudi Arabia because the great majority of health services are covered by MOH. In addition, the participating nurses

TABLE 1 Basic characteristics of respondents

Variable	N = 513	%
Gender		
Male	39	7.6
Female	474	92.4
Experience		
<5 years	100	19.5
5–9 years	215	41.9
10–15 years	121	23.6
>15 years	77	15.0
Educational level		
Diploma	180	35.1
Bachelor	326	63.5
Master and higher	7	1.4
Workshop attendance		
Yes	197	38.4
No	316	61.6
Current position		
Staff nurse	469	91.4
Nurse educator	9	1.8
Nurse manager	22	4.3
Nurse coordinator	3	0.6
Midwife	1	0.2
Charge nurse	4	0.8
Quality specialist	5	1.0

came from different countries and held different positions; this variety helps make the results transferable to other organizations.

4.4 | Data analysis

The initial analysis led to seven factors with eigenvalues of more than 1.0, accounting for 66.7% of the total variance. The initial domains were not applicable, interpretable or appropriate for the topic being investigated. The selection of domains found most appropriate to the data was (1) knowledge, (2) practice, (3) environment and (4) learning, accounting for 57.3% of the total variance with a cut point identified as 0.30 for component loadings. Two out of the 37 items were eliminated, and 35 items were retained for further analysis. The eliminated items were "My role as a nurse and what I am expected to do is clear to me" and "Clinical instructors used active cases to demonstrate learning theories." The other 35 items remained unchanged (see Appendix A).

4.5 | Research ethics committee approval

The aim of this study was explained, and Research Ethics Committee approval was obtained from the Ministry of Health, Saudi Arabia and each hospital administration prior to data collection. The

prospective participants received a cover letter containing a full description of the research and researcher details in case of any query. The participants were also informed that they would receive a copy of the research after publication. Furthermore, out of respect for each participant's autonomy, the primary investigator explained the study's aim to the participants and informed them that participation was voluntary and that they could withdraw from the study at any time without penalty. Those who agreed to participate in the study signed a consent form. The participants were also reassured about the confidentiality of their responses. Only the primary investigator has access to the data, which will be kept in a locked cabinet post-collection and destroyed after 5 years.

5 | RESULTS

Cronbach's alpha coefficients for internal consistency were calculated for the whole scale and for the components (Table 2). The overall coefficient was found to be 0.870. The coefficient for the first component, Knowledge (14 items), was 0.940. The value for the second component, Practice (6 items), was 0.785. The coefficient for the Environment component (9 items) was 0.920, and the value for the Learning component (6 items) was calculated at 0.853. Possible values for Cronbach's alpha ranged between 0 and 1 (Polit & Beck, 2017). The high values for the Cronbach's alpha analysis indicate that the component items had a high level of internal consistency and reliability.

6 | DISCUSSION

The tool revealed how a nurse's past and current background could affect the knowledge–practice gap, covering several dimensions related to knowledge, practice, environment and means of learning. Prior evidence had shown that the knowledge–practice gap for nurses is affected by various factors, which include personal motivation (Bagheri & Bazghaleh, 2016), educational content (Kerthu & Nuuyoma, 2019), clinical training (Hanifi et al., 2012) and organizational factors (Cheraghi et al., 2010).

Nevertheless, such factors may differ from one organization to another based on local induction and training. In each organization or region, some factors may be more prevalent than others. A study set in Oman showed that students who reported that they acquired the desired knowledge lacked essential technical skills due to gaps in their clinical training (Al Awaisi et al., 2015). Other findings have indicated that the core problem was that the concerned nursing curricula was outdated and needed revision (Crookes et al., 2013; Flood & Robinia, 2014).

Several studies have examined the impact of the nursing environment on the retention and professional satisfaction of nurses (Aboshaiqah, 2015; Albashayreh et al., 2019). Although research has shown that one essential element in the nursing environment is the creation of an environment that supports learning (Günay & Kılınc,

TABLE 2 PCA loadings and Cronbach's alpha values

Item	Component loadings	Cronbach's alpha if item deleted
Component 1: Knowledge (Cronbach's alpha = 0.940)		
1. I am interested in the nursing profession.	0.670	0.937
2. During my study, most of the clinical instructors were experienced and knowledgeable.	0.657	0.936
3. The educational curriculum I studied was updated.	0.711	0.935
4. I apply the theoretical knowledge I learned in my daily job.	0.714	0.935
5. I was taught to practice nursing based on evidence.	0.706	0.934
6. I was taught to practice nursing based on critical thinking.	0.799	0.933
7. I was taught to practice my role based on situational assessment.	0.703	0.937
8. I am interested in learning about medical conditions and treatment.	0.806	0.935
9. I am familiar with how to look up information about diseases and treatments.	0.805	0.934
10. I am interested in learning about disease process and pathophysiology.	0.787	0.934
11. I consider myself an active learner.	0.843	0.935
12. I do realize that my knowledge and practice affect a patient's outcome.	0.859	0.935
13. Every time I took care of a patient, I knew exactly what the diagnosis and the treatment was.	0.447	0.942
14. I prefer workshops and active participation to gain knowledge.	0.450	0.941
Component 2: Practice (Cronbach's alpha = 0.785)		
1. I had limited exposure to clinical scenarios during my college education.	0.706	0.754
2. The job demands exceeded my expectations.	0.547	0.782
3. Most of the daily work I do depends on physicians' orders.	0.505	0.792
4. Most of the care I provide is routine-based, not knowledge-based.	0.814	0.717
5. I lack the authority to change a patient's plan, even if it is right.	0.792	0.723
6. I do not feel I gain knowledge by attending conferences.	0.764	0.734
Component 3: Environment (Cronbach's alpha = 0.920)		
1. The unit I work in has effective communication.	-0.613	0.914
2. Senior staff and managers are supportive and willing to help me in my daily work.	-0.836	0.907
3. Senior staff are knowledgeable about diseases and treatments.	-0.758	0.907
4. Most of my colleagues behave professionally.	-0.850	0.909
5. I have knowledge about how to handle equipment in my unit.	-0.623	0.911
6. If we have a new machine, we receive training on how to use it before launching.	-0.843	0.909
7. Other disciplines respect my judgement.	-0.697	0.909
8. There are clinical practice guidelines for all the procedures I practise.	-0.486	0.914
9. The organization values knowledgeable nurses and rewards them.	-0.684	0.919
Component 4: Learning (Cronbach's alpha = 0.853)		
1. I feel my education prepared me to fulfil my role as a nurse.	0.418	0.841
2. During my orientation, I had sufficient knowledge about job prospects.	0.370	0.844
3. The clinical unit where I work encourages learning.	0.591	0.808
4. The clinical unit where I work requires continuous learning.	0.642	0.809
5. I have a role model in the unit.	0.384	0.830
6. The organization I am working in provides periodic workshops and lectures on various clinical nursing topics.	0.428	0.837

2018), some researchers have demonstrated that many nurses perform their duties based on routine orders for task accomplishment without applying knowledge to their practice (Factor et al., 2017; Ketola, 2009).

In the face of these varied findings, a unifying approach could be uniquely helpful. Various studies have indicated that the knowledge-practice gap is an influential single factor in a nurse's professional life

that gathers personal, professional and organizational factors under one umbrella. Therefore, this newly developed tool is highly valuable for its ability to measure nurses' perceptions and views about the main sources of this gap. Moreover, proper quantitative measures are necessary to give numerical evidence that will facilitate establishing the factors to which the gap between knowledge and

practice can be attributed. Use of the tool by multiple researchers in a variety of settings leads to proper identification of all potential factors internationally.

6.1 | Limitations

One limitation of this study is that it was carried out in two hospitals in a limited geographical area, which might limit its generalizability. Using a self-reported survey may carry a significant risk in that the respondents might answer in a way designed to leave a favourable impression, a problem known as social desirability. Furthermore, due to the subjective nature of survey results, these results may not accurately reflect the respondents' genuine beliefs. Another common limitation is the probability that participants' personalities or attitudes differ from those of non-participants.

7 | CONCLUSION

Knowledge contributes to the advancement of the nursing discipline. In particular, nurses knowledge saves the lives of patients and leads to their receiving quality care. Proper assessment of the sources of knowledge gaps is the first step toward effective intervention. The survey developed here on the knowledge–practice gap is a valid and reliable tool with psychometric properties that allow it to be used in other settings with different populations.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

RG: conceptualization, methodology, data collection, original draft preparation, visualization, investigation and reviewing and editing of the draft. MA: software, validation and statistical analysis.

DATA AVAILABILITY STATEMENT

The corresponding author will provide the data that support the results of this research upon reasonable request.

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APPENDIX A

KNOWLEDGE DOMAIN

Item	Strongly Agree (5)	Agree (4)	Neither agree nor disagree (3)	Strongly disagree (2)	Disagree (1)
1. I am interested in the nursing profession.					
2. During my study, most of the clinical instructors were experienced and knowledgeable,					
3. The educational curriculum I studied was updated.					
4. I apply the theoretical knowledge I learned in my daily job.					
5. I was taught to practice nursing based on evidence.					
6. I was taught to practice nursing based on critical thinking.					
7. I was taught to practice my role based on situational assessment.					
8. I am interested in learning about medical conditions and treatment.					
9. I am familiar with how to look up information about diseases and treatments.					
10. I am interested in learning about disease process and pathophysiology.					
11. I consider myself an active learner.					
12. I do realize that my knowledge and practice affect a patient's outcome.					
13. Every time I took care of a patient, I knew exactly what the diagnosis and the treatment was.					
14. I prefer workshops and active participation to gain knowledge.					

PRACTICE DOMINE

Item	Strongly Agree (5)	Agree (4)	Neither agree nor disagree (3)	Strongly disagree (2)	Disagree (1)
1. I had limited exposure to clinical scenarios during my college education.					
2. The job demands exceeded my expectations.					
3. Most of the daily work I do depends on physicians' orders.					
4. Most of the care I provide is routine-based, not knowledge-based.					
5. I lack the authority to change a patient's plan, even if it is right.					
6. I do not feel I gain knowledge by attending conferences.					

ENVIRONMENT DOMINE

Item	Strongly Agree (5)	Agree (4)	Neither agree nor disagree (3)	Strongly disagree (2)	Disagree (1)
1. The unit I work in has effective communication.					
2. Senior staff and managers are supportive and willing to help me in my daily work.					
3. Senior staff are knowledgeable about disease and treatments.					
4. Most of my colleagues behave professionally.					
5. I have knowledge about how to handle equipment in my unit.					
6. If we have a new machine, we receive training on how to use it before launching.					
7. Other disciplines respect my judgement.					
8. There are clinical practice guidelines for all the procedures I practise.					
9. The organization values knowledgeable nurses and rewards them.					

LEARNING DOMINE

Item	Strongly Agree (5)	Agree (4)	Neither agree nor disagree (3)	Strongly disagree (2)	Disagree (1)
1. I feel my education prepared me to fulfil my role as a nurse.					
2. During my orientation, I had sufficient knowledge about job prospects.					
3. The clinical unit where I work encourages learning.					
4. The clinical unit where I work requires continuous learning.					
5. I have a role model in the unit.					
6. The organization I'm working in provides periodic workshops and lectures on various clinical nursing topics.					