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REVIEW ARTICLE

Comparing perceived and actual diabetes knowledge among nurses: A rapid review

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Abstract

***Introduction*:** Nurses are valuable care providers to people with diabetes, yet day-to-day diabetes management most heavily relies on self-care practice. Inaccurate self-perceptions of diabetes knowledge among nurses may be linked to inadequate adherence to self-care practice among people with diabetes.
***Methods*:** The present study is a rapid review of perceived and actual diabetes care-related knowledge among nurses since an unusual inverse correlation of perceived and actual knowledge was first reported by Drass and colleagues in 1989.
***Results*:** Seventeen studies in 10 countries met the eligibility criteria for full review.
***Discussion*:** Low-to-moderate positive correlations revealed a discrepancy between perceived and actual knowledge among various nursing fields.
***Conclusion*:** Nurses with an accurate assessment of their own diabetes knowledge may be better equipped to not only treat people with diabetes, but also promote self-care practice through formal or informal interaction.

Keywords: *diabetes mellitus*; *nurses*; *knowledge*; *self-assessment*; *nursing education research*; *review literature*

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Diabetes is a non-communicable and chronic disease currently affecting over half a billion people worldwide. Adults with diabetes engage in a complex and demanding self-care regimen. Proper daily diabetes management requires 4 h of self-care activities[1] such as eating a healthful diet, monitoring of blood glucose, managing medication, and checking feet. Given that the burden of diabetes management weighs heavily upon patients themselves, nurses and similar healthcare professionals play a vital role in promoting diabetes self-care, whether directly or indirectly, through care and self-management education.[2,3] Diabetes knowledge and self-care practice among people with diabetes at least partially depends on the diabetes management instruction from nurses.[4,5] A large body of research has examined diabetes knowledge among nurses and other healthcare professionals. However, research is yet to provide a comprehensive and systematic comparison between nurses' self-assessed diabetes knowledge and objectively assessed diabetes knowledge. Nurses with an accurate assessment of their diabetes knowledge may be better equipped to treat and educate people with diabetes.[6,7]

Healthcare policy decision-making relies on evidence synthesis. In-depth systematic reviews require extensive amounts of time and effort whereas a rapid review conducted systematically offers a more feasible and timelier alternative while maintaining comparable methodological procedures. The present study is a rapid review of literature comparing perceived and actual diabetes care-related knowledge among nurses. The objective was to investigate the relationship between perceived and actual diabetes knowledge since the seminal study by Drass and colleagues[4] who first reported a startling inverse correlation of perceived and actual knowledge among staff nurses. Our primary research question investigated how subsequent studies on perceived and actual diabetes knowledge among nurses compare to the study by Drass and colleagues.[4]

Methods

Design

Compared to full-scale systematic review methodology, a rapid review is more resource efficient and defined as a knowledge synthesis to produce evidence with rigorous,

transparent, and streamlined methods.[8] The present review adhered to the highest ranked approach of the six rapid review approaches described by Tricco and colleagues,[9] which were developed with international input from government agencies, health ministries, and health care organizations. The present review's methods were aligned with the themes and defining characteristics of rapid reviews described by Hamel and colleagues,[8] they were informed by guiding principles from the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist,[10] and they met many of the recommendations from the Cochrane Rapid Review Methods Group.[11] Search strategy and inclusion criteria were developed in consultation with a research librarian and determined before conducting the search. Two reviewers were utilized throughout the project.

Search strategy

To identify studies for inclusion, a search of four online databases was conducted: Cumulated Index to Nursing and Allied Health Literature (CINAHL), PubMed, PsycINFO, and Scopus. Identical search terms were used for each database (see Table 1). Search term 1 was searched in abstracts and search terms 2 and 3 were searched in titles. A time restriction was applied to begin the search from 1989 since it was the publication year of the first study to compare perceived and actual diabetes knowledge.[4] Language was restricted to English. Two independent reviewers screened titles, abstracts, and manuscripts as needed to determine the eligibility of each article. No automation tools were used.

Eligibility criteria

Article eligibility criteria began with identifying any nursing population, including nursing students, and assessments of diabetes knowledge. The key inclusion criterion was a comparison of perceived and actual diabetes knowledge. Perceived diabetes knowledge was defined as self-assessed, self-reported, or perceived confidence in diabetes knowledge. Thus, perceived diabetes knowledge represented a subjective appraisal of one's diabetes knowledge. Conversely, actual diabetes knowledge was defined as an objective assessment of diabetes knowledge (i.e. standardized scoring with correct and incorrect response choices). Articles not published in a peer-reviewed journal were excluded from analysis.

Table 1. Databases and search terms

Databases	Search term 1 (Abstract)	Search term 2 (Title)	Search term 3 (Title)
- CINAHL - PubMed - PsycINFO - Scopus	nurs*	diabetes	Knowledge

Note: Each search term was connected with the Boolean operator 'AND'. An asterisk represents any group of characters. Databases were accessed January 2024. Example search criteria: (ABS(nurs*) AND TITLE(diabetes) AND TITLE(knowledge). Filters: began search from the year 1989, English Language.

Study selection

Both reviewers independently screened and selected articles. The first reviewer abstracted data (i.e. quantitative and qualitative data comparing perceived and actual diabetes knowledge) and assessed the risk of bias, while the second verified. Results were synthesized into a table (see Table 2). The first column describes each study's characteristics including sample size, type of nursing population, and country. The second and third columns list each article's measures of perceived and actual diabetes knowledge. The fourth column reports mean scores or mean percentage values of perceived and actual knowledge measures. Raw percentage values of perceived and actual knowledge scores are compared in text format by surrounding the words perceived and actual with parantheses and a mathematic symbol of inequality between (i.e. '>'). The final column is a qualitative analysis of the comparison of perceived and actual diabetes knowledge directly cited from each study. The Newcastle – Ottawa quality assessment scale adapted for cross-sectional studies was used to determine levels of bias among selected studies.

Results

We identified 17 cross-sectional articles[4,5,6,7,12,13,14,15,16,17,18,19,20,21,22,23,24] that met *a priori* eligibility criteria (see Figure 1). Table 2 contains the full results from the 17 articles. The total number of participants across the 17 studies was 3,189, including 10 countries and nursing professions such as staff nurses, paediatric nurses, and University nursing students. The most common measures used were the Diabetes Self-Report Tool (DSRT) for perceived knowledge and the Diabetes Basic Knowledge Tool (DBKT) for actual knowledge, both developed by Drass and colleagues.[4] Of the 11 studies that reported measures of association (e.g. Pearson's r correlation coefficient), all reported low-to-moderate correlations between perceived and actual diabetes knowledge scores, and no study reported an inverse correlation. Analysis of authors' comments on the relationship between perceived and actual diabetes knowledge forms a narrative synthesis. All articles comment on the importance of diabetes knowledge. Of the 17 studies reviewed, 13 studies[4,5,6,12,13,14,15,16,17,19,21,23,24] reported an observed discrepancy between perceived and actual diabetes knowledge, 1 study[18] reported no discrepancy, and comments from 3 studies[7,20,22] were unclear.

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Table 2. Study characteristics, knowledge measures, comparison of perceived and actual knowledge, authors' comments on findings

Authors, Year, (*N* =) Nursing population, Country	Perceived knowledge measure	Actual knowledge measure	Comparison of perceived and actual diabetes knowledge	Authors' direct comments on the comparison between perceived and actual diabetes knowledge
Albagawi et al., 2023[6] (325) Public Hospital and Primary Healthcare Nurses Kingdom of Saudi Arabia	Diabetes Self-Report Tool (DSRT)	Diabetes Basic Knowledge Tool (DBKT)	Mean DSRT score: 38.4 out of 60. Mean DBKT score: 23.2 out of 49. (perceived > actual) [a]$r = 0.011$ ($p = 0.055$)	'Therefore, the gap between nurses' perceptions of their knowledge and their real knowledge needs to be bridged through educational interventions and continuing education programs because it can greatly influence nurses' competence in caring for and managing diabetic patients' p. 7. 'Nurses affiliated with public health facilities in Hail province lack adequate knowledge about diabetes, with no correlation between what is perceived to be known by nurses and what they actually know' p. 9.
Alotaibi et al., 2017[12] (423) Registered Nurses Kingdom of Saudi Arabia	DSRT	DBKT	Mean DSRT score: 46.9 out of 60. Mean DBKT score: 25.4 out of 49. (perceived > actual) $r = 0.424$ ($p < 0.001$)	'This study found that nurses' actual knowledge of diabetes correlated positively but only moderately with their perceived knowledge of diabetes' p. 28. 'The findings of this study suggest significant gaps between the perceived and actual knowledge of diabetes among nurses in Saudi Arabia, which is concerning as knowledge has a significant impact on nurses' ability in caring for patients with diabetes' p. 29
Alotaibi, 2019[13] (149) Undergraduate Nursing Students Kingdom of Saudi Arabia	DSRT	DBKT	Mean DSRT score: 49.6 out of 60. Mean DBKT score: 14.1 out of 49. (perceived > actual) Correlation not reported.	'These results indicate a significant gap between perceived and actual knowledge as well as an inadequate level of actual knowledge regarding diabetes and its care and management' p. 487. 'The low level of actual knowledge regarding diabetes care and management demands attention from nursing schools. There is a need to increase content and improve the teaching method in nursing programmes with regard to diabetes care and its management' p. 487.
Alsolais et al., 2022[14] (330) Undergraduate Nursing Students Kingdom of Saudi Arabia	DSRT	DBKT	Mean DSRT score: 48.3 out of 60. Mean DBKT score: 22.5 out of 49. (perceived > actual) [b]$B = 0.11$ ($p = 0.020$)	'Finally, a 1-point increase in self-reported diabetes knowledge score resulted in a 0.11-point increase in actual diabetes knowledge score ($p = 0.020$; 95% CI, 0.02–0.20; Table 5)' p. 7. 'The students in the study rated their perceived knowledge higher than their actual knowledge' p. 9 'The findings underscore the necessity to improve the actual knowledge of undergraduate student nurses about diabetes and its management' p. 9.
Baxley et al., 1997[15] (32) Staff Nurses United States of America	DSRT	DBKT	Mean DSRT score: 92.3 out of 110. DBKT score: 75.3% correct (mean not reported). (perceived > actual) $r = 0.23$ ($p = 0.21$)	'There was a small, positive, but not statistically significant, relationship between perceived competence and actual knowledge' p. 96. 'As Orem's theory postulates, the nurse's role in the support of-educative system is to assist the patient with diabetes mellitus. This includes behavior control and acquisition of knowledge and skills. A sound knowledge base is essential for the nurse to function effectively in this role' p. 97.
Chan and Zang, 2007[7] (245) Staff Nurses Hong Kong – Special Administrative Region of the People's Republic of China	Modified Diabetes Self-Report Tool (MDSRT)	Modified Diabetes Basic Knowledge Test (MDBKT)	Mean MDSRT score: 72.3 out of 105. MDBKT score: 67.0% correct (mean not reported). (perceived > actual) [c]$\rho = 0.32$ ($p < 0.001$)	'Overall, nurses' perceived diabetes knowledge was statistically significant correlated with actual knowledge' p. 234. 'Nurses have the responsibility to educate patients with correct and updated information, therefore, knowledge should be provided and maintained to a certain standard' p. 234.
Corsi et al., 1994[16] (84) Staff Nurses Republic of Italy	[d]Perceived Knowledge (PK)	[d]Actual Knowledge (AK)	Mean PK score: 23.4 out of 24. Mean AK score: 16.3 out of 24. (perceived > actual) Correlation not reported.	'Our results suggest that a high percentage of nurses do not know enough to adequately follow-up and educate diabetic patients and, moreover, the high level of perceived knowledge induces a false security in them' p. 281. 'In conclusion, our study confirms the need to correct the lack of knowledge in the nurses that portends inadequate behaviour…' 284.

Table 2. (Continued)

Authors, Year, (*N* =) Nursing population, Country	Perceived knowledge measure	Actual knowledge measure	Comparison of perceived and actual diabetes knowledge	Authors' direct comments on the comparison between perceived and actual diabetes knowledge
Drass et al., 1989[4] (184) Staff Nurses United States of America	[d]DSRT	[d]DBKT	Mean DSRT score: 47.0 out of (not reported). Mean DBKT score: 28.6 out of 45. (undetermined) r = -0.36 (p < 0.001)	'Study findings raise questions as to the adequacy of staff nurse knowledge of diabetes and the ability of staff nurses to assess themselves for knowledge deficits' p. 351. 'In addition, the finding of an inverse correlation indicated that the more staff nurses perceived that they knew about diabetes, the less they actually did know. Both study findings raise questions as to the adequacy of staff nurses' knowledge of diabetes and their ability to conduct initial and continuing diabetes education' p. 354.
El-Deirawi and Zuraikat, 2001[17] (79) Registered Nurses United States of America	DSRT	DBKT	Mean DSRT score: 85.7 out of 110. Mean DBKT score: 32.3 out of 45. (perceived > actual) r = 0.402 (p < 0.0001)	'This investigation showed a small, but significant, positive correlation (r = 0.402, p < 0.0001) between perceived and actual knowledge of diabetes' p. 9. 'The findings of this study and other similar studies suggest that nurses are not knowledgeable enough about diabetes to be actively involved in diabetes education and to provide patients with the skills needed for survival' p. 10.
Gossain et al., 1993[18] (127) Staff Nurses United States of America	DSRT	DBKT	Mean DSRT score not reported. Mean DBKT score: 31.0 out of 45. (undetermined) 18 content areas ranging from r = 0.002 to 0.35 (p < 0.001 to 0.97)	'Although some areas of knowledge deficit were identified, we concluded that staff nurses employed at community hospitals are fairly competent in the field of diabetes and have a realistic perception of their knowledge deficiencies' p. 215. 'Based on these findings, in-service/continuing diabetes educational programs could be designed to address those areas in which the staff nurses feel least competent' p. 219.
Kobos et al., 2020[19] (202) School Nurses Republic of Poland	Self-Assessment of Diabetes Knowledge (SADK)	Diabetes Knowledge Questionnaire (DKQ)	SADK score: 77.4% (mean not reported). DKQ score: 46.7% (mean not reported). (perceived > actual) ρ = 0.18 (p = 0.009)	'In our study, we observed a discrepancy between the actual and perceived knowledge of type 1 diabetes among school nurses. Although school nurses had poor diabetes knowledge, they were rarely aware of it' p. 3. 'Thus, there is a need for additional training on diabetes among nursing students and practicing nurses, to provide safe and effective care for children with type 1 diabetes' p. 4.
Kudlová and Kočvarová, 2020[20] (237) General Practitioner Nurses Czech Republic	[d,e]Self-Assessment Knowledge	Revised Brief Diabetes Knowledge Test (DKT2)	Mean Self-Assessment Knowledge score not reported. Mean DKT2 score: 22 out of 33. (undetermined) [f]B = -2.094 (p = 0.005)	'Nurses in our study achieved 22 points on average within the DM knowledge test, which is a 51% success rate. That, however, is insufficient in respect to the desired increasing of nurses' competences' p. 169. 'In respect to the need to increase their competences in the area of care for persons with DM, it is necessary to bring their knowledge and skills up to date by means of qualification and lifelong education' p. 169.
Lange and Pearce, 2017[21] (69) Registered Nurses The United Kingdom	[d]Perceived hypoglycaemia	[d]Hypoglycaemia Range	45 of 69 nurses 'agreed' or 'strongly agreed' to knowing hypoglycemia guidelines. Only 34 of those 45 nurses identified correct hypoglycaemia range. (undetermined)	'These findings highlight that while some nurses feel confident in their knowledge around certain areas of diabetes care, their answers to diabetes knowledge and care questions do not reflect this. There appears to be a marked discrepancy between perceived and actual knowledge. As there was a significant relationship between those who were confident in their level of diabetes knowledge and those who were confident in delivering safe diabetes care, these gaps in actual knowledge are potentially impacting on patient care.' p. 206. 'With the increasing prevalence of diabetes, its complexity and changes in management, it is essential RNs have current diabetes knowledge' p. 207.

Table 2. (Continued)

Authors, Year, (*N* =) Nursing population, Country	Perceived knowledge measure	Actual knowledge measure	Comparison of perceived and actual diabetes knowledge	Authors' direct comments on the comparison between perceived and actual diabetes knowledge
Ramjan et al., 2017[22] (78) Japanese Undergraduate Nursing Students (85) Australian Undergraduate Nursing Students Japan and Commonwealth of Australia	[d]Perceived competence and confidence	Michigan Diabetes Knowledge Test (MDKT) and Clinically-Related Diabetes Knowledge Test (CDKT)	Japanese Sample: Perceived competence 66.7% and confidence 10.3%. MDKT score 74.3% and CDKT 65.0%. (perceived competence and confidence < MDKT actual, but competence > CDKT) Australian Sample: Perceived competence 92.9% and confidence 82.4%. MDKT score 70.0% and CDKT score 71.4%. (perceived > actual) No raw means or correlation reported	'While both groups felt they received enough classroom education on DM, the Japanese students self-reported lower perceived competency, self-confidence, and felt less prepared to care for DM patients. However Japanese students performed slightly better on the MDKT than Australian students' p. 7. 'There remains room for improvement, particularly a need for increased teaching hours at University and greater clinical practice time caring for patients with DM, to further improve knowledge and skills' p. 7. 'Greater clinical practical experience combined with sound theoretical knowledge among nursing students will potentially translate to more confident and better prepared future clinicians in practice, ultimately resulting in improved outcomes for DM patients' p. 11.
Sargant, 2002[5] (89) Community Nurses The United Kingdom	[d]Self-assessed dietary diabetes knowledge	[d]General diabetes knowledge and dietary aspects of diabetes	83% of nurses perceived themselves to have 'satisfactory', 'good', or 'very good' dietary specific diabetes knowledge. Correct responses on objective knowledge were 71%. (perceived > actual)	'This study identified a positive correlation between actual and perceived knowledge levels, and thus did not support the statement that "the more staff nurses perceived that they knew about diabetes, the less they actually did know," (Drass et al., 1989). However, this study determined that the participants had inadequate knowledge levels to educate patients in diabetes-related issues. Thus the study supported the main findings of Drass et al (1989), who had associated poor patient compliance and understanding of diabetes mellitus with poor knowledge levels of associated health professionals' p. 619.
Thomas, 2004[23] (174) Paediatric Nurses The United Kingdom	[d]Perceived Knowledge and Confidence Questionnaire Adapted from DSRT	[d]Knowledge Questionnaire Adapted from DBKT	Reported a correlation of perceived and actual knowledge in narrative format on page 221. Did not report data on mean scores or a correlation coefficient. (undetermined)	'Perceived knowledge and confidence (DSRT) scores correlated with knowledge (DBKT) scores, i.e. those with poor confidence and perceived knowledge had lower knowledge scores (Figure 3)' p. 221. 'This study clearly highlights a shortfall in diabetes knowledge among ward-based paediatric nurses' p. 221.
Yacoub et al., 2014[24] (277) Registered Nurses Hashemite Kingdom of Jordan	DSRT	MDBKT	Mean DSRT score: 78.9 out of 110. Mean MDBKT score: 28.5 out of 45. (perceived > actual) $r = 0.33$ ($p < 0.001$)	'Findings demonstrate that perception of knowledge had little bearing on the actual score…' p. 6. 'A knowledge deficit regarding diabetes was demonstrated by Jordanian nurses who participated in this study. Nurses' actual knowledge of diabetes was moderately associated with their perceived knowledge …' p. 7. 'Trends in diabetes management are constantly changing and these findings support the need to have continuing education programmes that update nurses' knowledge and provide opportunities to acquire new information on diabetes and its management' p. 7.

Note 1: [a]Pearson correlation coefficient. [b]Unstandardized regression coefficient. [c]Spearman correlation coefficient. [d]Author original measure. [e]The lower the value, the more positive the self-assessment of diabetes knowledge (this scale is reversed when compared to the DSRT and other listed perceived diabetes knowledge measures). [f]Unstandardized regression coefficient which likely indicates a weak, positive relationship between perceived and actual knowledge of diabetes.

Note 2: Descriptive example of percentage comparison calculations: Albagawi and colleagues[6] reported a mean DSRT score of 38.4 out of 60, indicating a raw perceived knowledge percentage of 64% (38.4/60 = 0.64). The same study reported a mean DBKT score of 23.2 out of 49, indicating a raw correct percentage of 47% (23.2/49 = 0.47). Thus, the percentage value of DSRT (64%) is greater than the percentage value of the DBKT (47%). To facilitate interpretability, percentage comparisons are simply presented in text format as follows: (perceived > actual).

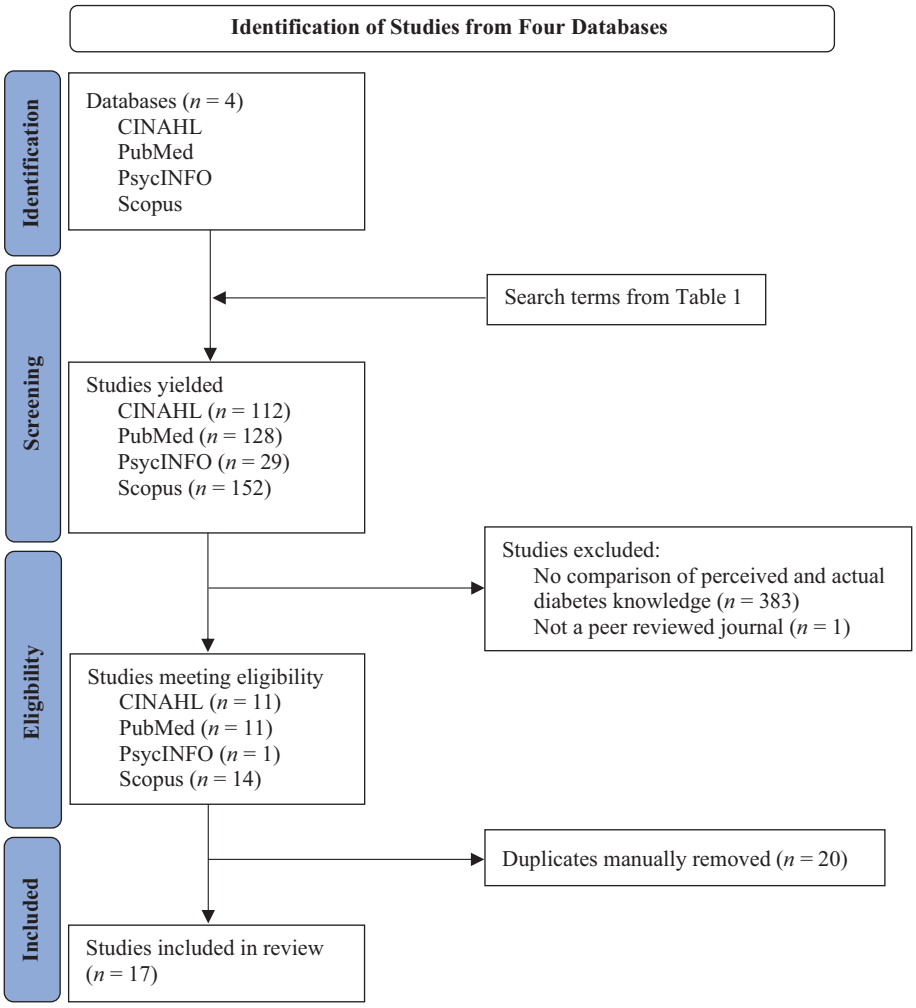

Figure 1. Flow diagram: identification, screening, eligibility, and included.

The Newcastle – Ottawa quality assessment scale (see Table 3) revealed that 65% of studies reviewed had at least medium risk of bias. The most frequently missed point on the quality assessment scale was from the comparability section – few studies reported controlling for covariates when measuring the association between perceived and actual knowledge, although covariates may have been measured. For example, Alotaibi and colleagues[12] noted gender differences in perceived and actual knowledge, but it was unclear if they statistically controlled for these differences when comparing perceived and actual knowledge with a correlation coefficient.

Discussion

Nurses are indispensable and impactful care providers to people with diabetes.[25] Insufficient diabetes knowledge among nurses may negatively impact patient care and diabetes management.[2] Given that the chronic burden of diabetes and its routine management rests heavily on patients, nurses' diabetes knowledge is critical for management[26] and promoting self-care. The present review represents the first systematic and comprehensive comparison of perceived and actual diabetes knowledge among nurses. Findings of the present review underscore a discrepancy between perceived and actual diabetes knowledge among nurse populations with undergraduate or general training in diabetes. This gap in perceived and actual knowledge may affect patient care and self-management.[4,21] An accurate understanding of their own diabetes knowledge likely enables nurses to efficiently provide diabetes education and training to promote self-care practice among people with diabetes.

Despite the unusual finding of an inverse correlation of perceived and actual diabetes knowledge by Drass and colleagues,[4] the present review demonstrates that subsequent research has consistently reported weak, yet positive correlations. Higher percentage scores were observed on perceived measures compared to relatively lower scores on objective measures of diabetes knowledge. However, the low correlation coefficients across studies may indicate

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Table 3. Results from quality assessment

Authors, Year	Selection	Comparability	Outcome	Total score	Risk of bias
Albagawi et al., 2023[6]	3	1	3	7	Low
Alotaibi et al., 2017[12]	3	1	3	7	Low
Alotaibi, 2019[13]	1	1	2	4	High
Alsolais et al., 2022[14]	3	2	3	8	Low
Baxley et al., 1997[15]	2	0	3	5	Medium
Chan and Zang, 2007[7]	2	1	3	6	Medium
Corsi et al., 1994[16]	3	1	2	6	Medium
Drass et al., 1989[4]	2	1	3	6	Medium
El-Deirawi and Zuraikat, 2001[17]	2	1	3	6	Medium
Gossain et al., 1993[18]	1	1	3	5	Medium
Kobos et al., 2020[19]	2	1	3	6	Medium
Kudlová and Kočvarová, 2020[20]	2	2	3	7	Low
Lange and Pearce, 2017[21]	3	1	2	6	Medium
Ramjan et al., 2017[22]	3	1	3	7	Low
Sargant, 2002[5]	2	0	2	4	High
Thomas, 2004[23]	2	0	2	4	High
Yacoub et al., 2014[24]	3	1	3	7	Low

Note: Total scores of 7 or 8 points indicate low risk of bias, 5 or 6 points indicate medium risk of bias, and 4 points or less indicate high risk of bias. Selection had a maximum of 3 points, comparability had a maximum of 2 points, and outcome had a maximum of 3 points.

little-to-no correlation between perceived and actual knowledge, as opposed to an overestimation of actual knowledge. For example, the study by Albagawi and colleagues[6] provided a simple scatterplot (see Figure 2 on page 7) that visually presented the results of a negligible correlation. The figure depicts that while some nurses overestimate their actual diabetes knowledge, others underestimate their actual knowledge, suggesting that overall, nurses have an inaccurate self-assessment of diabetes knowledge.

Studies reporting any level of nursing expertise, including students, were included for synthesis. The relationship between perceived and actual diabetes knowledge was compared within each type or level of nurse population. For example, Alotaibi[13] assessed perceived and actual knowledge among undergraduate nursing students and reported a significant gap. Albagawi et al.[6] assessed perceived and actual knowledge among primary healthcare nurses and reported a gap. Thus, these studies and others described in Table 2 are consistent; there is a discrepancy between perceived and actual diabetes knowledge among nurses across types or levels of nursing expertise. Comparisons between nurse populations (e.g. nursing students, registered nurses) were not made. Other research has examined the relationships between constructs similar to perceived and objective knowledge. For example, Findlow and McDowell[25] did not measure perceived diabetes knowledge but rather self-appraised clinical diabetes experience. They reported that registered nurses' perceived experience was not related to their actual knowledge, suggesting that despite levels of perceived clinical experience, nurses may lack adequate diabetes knowledge to educate patients on self-care practice.[25] Research has linked diabetes-related attitude to objective knowledge. For example, Abdirahman and colleagues[27] reported a gap between perceptions of diabetes complications and diabetes knowledge among nursing students in Saudi Arabia in that their knowledge was assessed as higher than the general population, but the majority considered the disease severity of type 2 diabetes as low. Authors suggested that an attitude of perceiving diabetes as only a mild disease may impact subsequent clinical practice despite diabetes knowledge levels.[27]

No systematic searches were performed outside of the aforementioned databases. However, grey literature has compared perceived and actual diabetes knowledge among nurses. A study of 77 medical-surgical nurses conducted by Hess[28] in the United States reported a positive, weak relationship between perceived and actual knowledge (mean DSRT score was 67.5 out of 88; mean DBKT score was 28.4 out of 43; perceived > actual; $r = 0.26$; $p < 0.05$). The study did not meet inclusion criteria because it was not published in a peer-reviewed journal. Google searches revealed two unpublished articles examining perceived and actual diabetes knowledge. First, Kupris[29] reported a positive, yet weak correlation between perceived and actual knowledge among 60 registered staff nurses in the United States (mean DSRT score was 77.6 out of 110; mean DBKT score was 31.6 out of 45;

perceived > actual; $r = 0.231$; $p = 0.038$). Second, among 50 acute inpatient staff nurses in the United States, Ledbetter[30] reported a positive, moderate association between perceived and actual knowledge (mean DSRT score was 59.8 out of 80; mean DBKT score was 59.5% correct; perceived > actual; $r = 0.321$; $p = 0.023$). Results from these three grey literature studies are thematic to the findings of our 17 reviewed articles.

The need to improve diabetes knowledge among nurses has been established. An integrative review of diabetes knowledge among nurses by Alotaibi and colleagues[31] brought to light pervasive and prolonged deficits across countries and healthcare systems. The findings of our review add to those of Alotaibi and colleagues[31] by highlighting a consistent gap in perceived and actual knowledge among nurses, demonstrating that inaccurate assessment of one's diabetes knowledge may pose an issue above and beyond a knowledge deficit itself. We suggest that not only is it important to increase diabetes knowledge, but also awareness of one's knowledge level given that nurses' diabetes knowledge must be accurately assessed to plan effective diabetes management programs.[7]

Healthcare professionals treating people with diabetes tend to have difficulty sharing the responsibility of diabetes management with their patients.[32] Because communication between healthcare professionals and patients is critical to diabetes self-care adherence,[33] nurses with accurate self-assessed diabetes knowledge likely provide better education. Diabetes self-management interventions have revealed significant effects of customized self-management plans and feedback programs, stressing the value of tailoring interventions to be patient-centred.[7,34] Our review adds to this research by emphasising the need for nurses to accurately assess their diabetes knowledge to effectively customize people-centred diabetes self-management plans by training and supervising self-care practice (e.g. physical activity, diet, blood glucose self-monitoring). In sum, we propose that it is important that nurses develop and sustain an accurate assessment of their own diabetes knowledge level to best treat patients and promote diabetes self-care.

Strengths

Tricco and colleagues[9] developed and ranked six rapid review approaches according to feasibility, comprehensiveness, and risk of bias. Results produced 'approach 1' as the highest ranked approach to rapid reviews in terms of feasibility and low risk of bias. Approach 1 was characterized by a study selection by only one reviewer, a search of at least one database limited by published literature, time, and language.[9] The present rapid review exceeds the methodological rigor of approach 1 and the other approaches. For example, we did not apply time restrictions apart from beginning searches at the inception year of the first study to compare perceived and actual diabetes knowledge among nurses.[4] We discussed findings from three grey literature studies[27,28,30] and we utilized two reviewers for study screening and selection in four databases to ensure rigorous study selection. For example, one discrepancy in article selection between the two reviewers was resolved by including the article by Ramjan and colleagues.[22] After discussion, we considered the authors' measures[22] of 'perceived competence' and 'perceived confidence' in caring for people with diabetes as satisfactory for assessing perceived diabetes care-related knowledge.

Limitations and future directions

There are limitations to the present review. It is important to note that the 17 articles of our review referred to nurse populations with undergraduate or general training in diabetes. No study assessed diabetes knowledge among a nurse population with diabetes care specialization and self-management education. Thus, gaps between perceived and actual knowledge may be less surprising when considering that knowledge discrepancies can be explained by nursing theories of skill development. For example, Benner's pioneering work of the novice to expert model[35] would suggest that nurses gain greater levels of proficiency through experientially refining clinical perceptions and adding nuances to their theoretical knowledge. The PRISMA checklist guided aspects of our rapid review methodology, but the standards of a full-scale systematic review (for which the PRISMA checklist was developed) were beyond our scope. Future research may consider a full-scale systematic review and meta-analysis to determine the magnitude of the association between perceived and actual knowledge among nurses. The quality assessment revealed a concerning level of potential bias suggesting that some articles lacked methodological rigor. However, the more recent articles reviewed appeared to have more robust methodology. The review was not pre-registered, no methods were used to assess reporting bias, and studies potentially meeting inclusion criteria may have not been found using our search criteria.

Despite these limitations, the findings of our review inform future research examining diabetes knowledge among nurses. For example, a pragmatic next step would be to understand how knowledge perceptions impact provider-patient communication and subsequent self-care practice. By employing longitudinal designs, further investigation may elucidate when, where, and how a gap of perceived and actual diabetes knowledge may impact care of people with diabetes and self-care practice. It is known from the novice to expert model[35] that increasing concrete experience and developing deeper perception and holistic understanding lead to higher levels of

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nursing proficiency. Critical self-reflection among nurses is also important for proficiency. Future research may explore the role of critical reflection[36] of professional practice experience between proficiency levels (e.g. novice to expert[35]) to better align perceived and actual diabetes knowledge. Further research is warranted to understand the factors contributing to the gap between perceived and actual diabetes knowledge among nurses and to determine whether the phenomenon is also common to other healthcare professionals.

Implications

This review may contain implications for policy, practice, and future research involving nursing education and training. Improving nurses' knowledge of diabetes is necessary, yet insufficient to facilitate diabetes self-care practice.[32] The following implications and recommendations may promote accurate self-assessment of diabetes knowledge among nurses.

- Standards for basic knowledge, competency, and skills may be established for all levels of nurses in regular contact with people with diabetes.[3] Standards may include the ability to customize diabetes management plans[7,34] to meet the needs of individuals by considering personal characteristics such as diabetes type, comorbidities, demographic factors, and psychosocial factors.
- Research demonstrates that people with diabetes need repeated self-care support, and both face-to-face and non-face-to-face nursing education interventions are effective.[34] Nurses who can independently provide basic education on diabetes types, causes, and related complications can better support diabetes self-management. Maintaining independent knowledge and competency may help to avoid overdependence on diabetes care and education specialists.[17,20]
- In-service education and training may be regularly completed to maintain competency and keep up with advancing diabetes policies, procedures, and treatment.[12,17] Mandatory training is likely more effective than voluntary training.[20,21,23] In-service training may assess knowledge competency and skill validation, utilizing remedial study where necessary. For example, organizations can require assessments for proper glucose testing, insulin administration, and medication management.[12,14,15,17,21,26]
- University nursing programs may continually assess diabetes competency among students to minimize knowledge deficits, maximize skills, and promote self-awareness. For example, clinical opportunities for care and treatment of people with diabetes afford students the opportunity to connect curricula with practice, fostering greater diabetes competency.[13,14,22]

Conclusion

Findings of the present review emphasise the importance of developing and maintaining accurate perceptions of diabetes knowledge to provide care and instruction for people with diabetes. Increased diabetes care specialization and self-management education may be required to close to the gap between perceived and actual diabetes knowledge among nurses. Direct and indirect care provided by nurses to patients can vary based on the country, culture, and healthcare system. Whether formal or informal, nurses may have the most significant and long-term impact on diabetes through educating patients to adequately engage in self-care activities. Critical self-reflection among nurses cultivates knowledge and skill that lead to greater nursing expertise and patient care.[36] As nurses accurately assess their own diabetes care-related knowledge, they may be better equipped to treat people with diabetes and skilfully promote adherence to self-care practice. In doing so, nurses may ultimately contribute to reducing the global burden of diabetes.

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