Database selection and data gathering methods in systematic reviews on qualitative research regarding diabetes mellitus - An explorative study

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Abstract

Background

Systematic reviews (SRs) are considered one of the most reliable types of studies in evidence-based medicine. This relies on a comprehensive and systematic search by choosing ideal data gathering methods including selection of databases. The aim of this study was to investigate which combination of databases results in the highest recall of references when conducting SRs on qualitative research regarding diabetes mellitus. Furthermore, we aimed to investigate the current use of databases and the importance of other sources for data collection.

Methods

23 SRs (published between the year 2010 and 2019) on qualitative research regarding diabetes mellitus were located through searching PubMed and met the inclusion criteria. Data, including number of databases searched, names of databases, use of additional data sources and use of information specialists were collected for each SR. The SRs concluded a total of 459 unique, qualitative references on diabetes mellitus. These references were systematically hand searched in the five most searched databases: Cumulative Index to Nursing and Allied Health Literature (CINAHL), MEDLINE, PsycINFO, Embase and PubMed.

Results

The SRs searched four databases on average (range two to eight). CINAHL was the most searched database, (19 of the 23 SRs). Two SRs mentioned the involvement of an information specialist and 16 of 23 (70%) SRs searched reference lists of included references, which on average resulted in 16% more references being included. A total of 36 (8%) references were found only in one of the five databases, with CINAHL retrieving the highest number of unique references. Searching the combination of the three databases PubMed, Embase and CINAHL resulted in an overall recall rate of 99.3%, while adding PsycINFO increased overall recall to 99.8%.

Conclusions

We recommend combining the searches of CINAHL, PubMed, Embase and PsychINFO, and to involve an information specialist to ensure high recall rates, when conducting SRs on qualitative research regarding diabetes mellitus. Especially CINAHL is highly relevant and important to use when searching for qualitative research.

Background
Systematic reviews (SRs) are thorough reviews of the literature on a clearly outlined research question and are considered one of the most reliable types of studies in evidence-based medicine (1). Investigators are advised to search in multiple databases as well as use additional methods when gathering references for SRs to include as many relevant references as possible (2). This is to assure the minimizing of selection bias (3). As an example the Cochrane Handbook recommends searching Cochrane Central, MEDLINE and EMBASE as a minimum when conducting SRs of randomized controlled trials (4). However, the process of searching through multiple databases can be tenuous as each database has its own interface and need separate search strings. Therefore the involvement of an information specialist (e.g. librarian) is generally recommended to improve the search quality (4, 5) and a recent study found that the assistance of information specialists significantly increased the use of recommended search methods (6). One of these recommended methods is to search reference lists of included studies, which has previously been reported deployed by approximately 48–97% of quantitative SRs (6–8). Further, the question of how many databases an investigator needs to search in order to reach an acceptable number of references for the purpose of SRs is highly relevant. It is equally important to know which databases will give the broadest search results and highest likelihood of unique references i.e. references not found elsewhere within a given field. These questions have been investigated prior within qualitative research in general terms (9) and within depression (10), and in quantitative research (11–15) with one study regarding diabetes mellitus (16). However, it has not previously been investigated in SRs on qualitative research regarding diabetes mellitus.

Diabetes mellitus is one of the most frequent chronic diseases in the 21st century with a global prevalence estimated at 9.3% (463 million people) in 2019 and an estimated increase to 700 million (10.9%) by 2045 (17). This disease requires a lot of maintenance by the patients as they need to control diet, exercise, medication and health check-ups with podiatrists, ophthalmologists and general practitioners or endocrinologists. At the same time, the patient might not feel symptoms of illness. These are some of the reasons why compliance is a sizeable problem in this patient group (18), resulting in higher occurrence of complications. It is therefore important to better understand the barriers concerning the patients’ compliance. Qualitative studies create an opportunity not obtained by quantitative studies by seeking to understand the clinicians’, caregivers’, relatives’ and, most importantly, the patients’ point of view. In the field of diabetes mellitus, qualitative studies can bring insight on which measures are successful in keeping compliance and on the impact of living with diabetes.

The aim of this study was to investigate how many and which combination of databases would result in the highest recall of references when conducting SRs on qualitative research regarding diabetes mellitus. Furthermore, we aimed to investigate the current use of databases, involvement of information specialists and the importance of additional sources such as search of reference lists.

**Methods**

**Inclusion and exclusion of SRs**
SRs on qualitative research regarding diabetes mellitus were retrieved from searching PubMed. The search terms were ("Qualitative Research" [Mesh]) AND ("Diabetes Mellitus" [Mesh]) with “Systematic reviews” as filter for all entries prior to the day of inclusion (April 11, 2020). This resulted in 30 SRs available for further evaluation. No language restrictions were applied, however the search only yielded English results. We included SRs of both qualitative and mixed methods (both qualitative and quantitative) research regarding all subtypes of diabetes mellitus. All SRs had to provide a full list of databases searched and included references had to be extractable through the reference list or supplementary data. The initial 30 SRs were systematically full text evaluated according to the inclusion and exclusion criteria, which resulted in the inclusion of 23 SRs. Exclusion criteria included SRs that focused solely on other diseases than diabetes mellitus or were only included quantitative methodological in nature. For full list of exclusion criteria, see Fig. 1.

Data, including number of databases searched, which databases, use of additional data sources and use of information specialists were collected for each SR.

**Inclusion and exclusion of references from SRs**

A list of all included references from each SR was extracted. Each reference was evaluated on whether it met the inclusion and exclusion criteria. Inclusion criteria were published articles, qualitative in nature and regarding diabetes mellitus. Exclusion criteria were quantitative references included in mixed methods SRs and references on diseases other than diabetes mellitus included in SRs on multiple diseases. Figure 1 illustrates the inclusion process of SRs and references.

The included references concluded a total of 665 references, however five could not be extracted, leaving a total of 660 references. Duplicates, quantitative references and references on diseases other than diabetes mellitus were removed. 459 unique, qualitative references on diabetes mellitus were available for analysis and included. These references were systematically hand searched in the five most searched databases: Cumulative Index to Nursing and Allied Health Literature (CINAHL), MEDLINE, PsycINFO, Embase and PubMed. MEDLINE, Embase and PsycINFO were searched using the OVID® search engine.

All references were initially searched by title. If title search did not retrieve the reference, further searches, initially by the basic search functions and later by keywords, authors and journals were commenced. For each reference, it was documented whether or not they were found in each of the databases.

**Statistical analyses**

Number of databases and frequency of databases searched were described in absolute numbers as well as average, median and range. Contribution of references for each individual database and the various combinations of their combined contribution were calculated as absolute numbers and recall or combined recall. Recall was calculated using the total number of included references retrieved by the database or database combination divided by the total number of included references retrieved by all databases, given in percentage. Calculations for correlation of number of databases and year published were performed using Poisson regression. Searches of reference lists were described in absolute numbers
as well as average, median and range. All statistical analyses were performed using R for Windows (v. 4.0.2 R-Studio v. 1.3.1093).

Results

A total of 23 SRs containing 665 references were included in this study. See appendix 1 for an overview of included SRs. After the exclusion process 459 unique qualitative references on diabetes mellitus were included in the analyses. The SRs included were published between the year 2010 and 2019. The median year was 2015 (inter quartile range 2013–2018). No correlation could be found between year of publication and number of databases searched.

Databases and frequency of use

The average and median number of databases searched in the SRs were four, and ranged from two to eight, Fig. 2.

The 23 SRs searched 25 different databases of which 10 were reported more than once, Fig. 3. One SR searched eight databases of which only two were searched by other SRs. CINAHL was the most searched database, searched by 19 of the 23 (83%) SRs, followed by MEDLINE which was searched by 16 (70%) SRs. PubMed was searched nine times (39%), however two SRs used both MEDLINE and PubMed. All 23 SRs searched either MEDLINE or PubMed. Embase and PsycINFO were used 10 (43%) and 11 (48%) times, respectively.

The use of information specialists and additional sources

Only one (4%) SR involved an information specialist when choosing databases. To create a comprehensive search strategy they used different approaches including: “building blocks” (21), “Berry Picking” (22, 23) and “drop a concept” (21). This SR searched seven databases including MEDLINE, CINAHL, Embase and PsychINFO and included an additional 3% references by searching reference lists of included studies. Another SR used a search filter developed by an information specialist and searched Medline, CINAHL and ISI Web of Science Social Sciences Citation Index (SSCI). The remaining 21 SRs did not mention using an information specialist. 16 of the 23 (70%) SRs searched reference lists of included articles which on average resulted in 16% (range 0–75%, median 7.5%) more references being included than by database searches alone. Three SRs exclusively searched databases, while the remaining SRs in addition to databases searches hand searched journals, key authors or other sources.

Unique references per database

The five most searched databases (CINAHL, MEDLINE, PsychINFO, Embase and PubMed) were investigated individually. A total of 36 (8%) references were found only in one of the five databases. Table 1 shows the number of unique references for each database. CINAHL retrieved the highest number
of unique references followed by Embase, PsycINFO and PubMed. MEDLINE did not retrieve any unique references.

| Database   | Number of SRs that searched the database | Number of SRs with unique references | Number of unique references |
|------------|-----------------------------------------|-------------------------------------|-----------------------------|
| CINAHL     | 20                                      | 9                                   | 23                          |
| MEDLINE    | 17                                      | 0                                   | 0*                          |
| PsychINFO  | 11                                      | 2                                   | 2                           |
| Embase     | 10                                      | 3                                   | 10                          |
| PubMed     | 8                                       | 1                                   | 1                           |

* Six references were only found in both MEDLINE and PubMed.

### Search of databases and their overall recall

For the five most searched databases the recall rates of the 459 individual references included in the 23 SRs were calculated. The calculations are shown in Table 2. Searching PubMed or MEDLINE yielded close to the same recall rates (86.7% and 86.5%, respectively). A combination of PubMed, CINAHL, Embase and PsychINFO showed an overall recall rate of 99.8% with a minimum recall of 93.3%. The most used combinations of databases were PubMed/MEDLINE and CINAHL followed by PubMed/MEDLINE and Embase (87% and 44% of SRs, respectively).

Only one reference was not found in any of the five databases. However, this reference was also not found in the three other databases searched in the SR. The SR states that additional references were retrieved through reference lists of included studies.

### Discussion

Our study underlines the importance of choosing the right database combination, using an information specialist and additional data gathering methods when conducting qualitative SRs.

To our knowledge, this is the first study investigating the use of databases in SRs on qualitative research within the field of diabetes mellitus. It has previously been suggested that a SR must include at least 95% of the publications on any given subject to be ample (11). In our study, we found that the combination of PubMed, Embase, CINAHL and PsychINFO resulted in an overall recall of 99.8%. We found that 30% of the SRs included in our study searched four databases. However the combination of PubMed (or MEDLINE), Embase, CINAHL and PsychINFO were used in only 17.4% of the SR. These results are in line with the results from a study investigating database searches within qualitative research in general. The study concluded that the optimal number of databases was four (SCOPUS, CINAHL, ProQuest...
Dissertations and Theses Global and PubMed) with an overall recall of 93.1% (9). However, the study included types of publications other than journal articles: books, theses, reports and unknown, which were less frequently indexed in databases.

Our data showed that CINHAL contributed to unique references in 39.1% of the SRs. These results coincide with results from a previous study investigating qualitative SRs, as they found CINAHL to contribute to at least one unique reference in 42% of the SRs (24). However, a study investigating SRs, not specified as quantitative or qualitative, found that CINAHL only contributed with unique references in 6% of the SRs (11), and a study searching for references included in NICE guidelines found that CINAHL only yielded 0.33% unique references (25). This suggests, that CINAHL is highly relevant and important to use when searching for qualitative research, but less contributive in quantitative fields of research. We found that 16 of the 23 (69.6%) SRs searched reference lists of included references, which on average resulted in 16% (range 0–75%, median 7.5%) more references being included than by database searches alone. The outlier SR with 75% (second to this was 33%) more references included through reference lists than by database searches alone, searched only two databases (PubMed and Web of Science). The SR that involved an information specialist included additionally 3% references by searching reference lists and key authors. Again, this coincides with results from a previous study finding the additional yield of relevant studies identified through checking reference lists ranged from 3% to 75% extra references included (26). Our data showed that only two SRs (9%) used either an information specialist or a search filter developed by an information specialist. These results contradicts prior findings within mainly quantitative research, with a study finding 51% of SRs made use of a librarian, but only 64% actually acknowledged using their assistance (6).

We found that only one reference was unique to the PubMed database. This was however expected since PubMed includes all MEDLINE references and as well as up-to-date citations and references from journals not indexed in MEDLINE (27). However, the most recent SR included was published in 2019, which means all SRs was published for a significant amount of time, making references more likely to be available in both databases. The larger quantity of content in PubMed compared to MEDLINE might make a difference when searching for references for a SR, as the most recently published articles will not be found in MEDLINE, but solely in PubMed. For that reason, we recommend the use of PubMed over MEDLINE, despite MEDLINE being the second most frequently searched database by the SRs included in our study.

Limitations

This study has a number of limitations. Firstly, the SRs included in this study were found through the database PubMed. Other databases were not searched for SRs on qualitative research regarding diabetes mellitus. This might result in selection bias. Secondly, since we investigated only the topic of SRs on qualitative research regarding diabetes mellitus, our results may not apply to other disease topics. Thirdly, there are a number of databases not searched through in this study such as SCOPUS, Web of Science and British Nursing Index, which were the following three most frequently searched databases by the
included SRs after the databases already searched in the study. It is possible that combinations including these databases might have concluded in higher recall rates. Fourthly, whether a reference is present in a database does not directly translate into whether it would have been found using a given search string. Therefore, our results might not transfer directly to the search of references when conducting a SR. Using an information specialist to assist in making and optimizing the search string is one way of increasing the sensitivity of the database search, while another way of increasing the sensitivity of the search with a high specificity is searching the reference lists of included references as argued above.

**Conclusions**

Based on our findings, we recommend combining the database searches of CINAHL, PubMed, Embase as well as PsychINFO and involving an information specialist to ensure high recall rates, when conducting SRs on qualitative research regarding diabetes mellitus. Especially CINAHL is highly relevant and important to use when searching for qualitative research. This study also highlights the importance of searching reference lists of included references in SRs to complement database searches. Further research on the subject should try to establish whether our findings within diabetes mellitus are similar in other disease areas within qualitative research.

**Abbreviations**

CINAHL Cumulative Index to Nursing and Allied Health Literature

CIN CINAHL

COPD chronic obstructive pulmonary disorders

EMB Embase

HIV human immunodeficiency virus

MED MEDLINE

PBM PubMed

PSI PsycINFO

SR systematic review

SSCI ISI Web of Science Social Sciences Citation Index

**Declarations**

Ethics approval and consent to participate
Not applicable

Consent for publication
Not applicable

Availability of data and materials
The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests
The authors declare that they have no competing interests.

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Authors' contributions
TJ, JF and AS: Wrote the manuscript. TJ and JF collected the data. AS performed the data analyses. TJ and AS conceptualized the study. All the authors contributed to editing and revision of the manuscript.

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Not applicable

References
1. Cochrane AL. Effectiveness and Efficiency: Random Reflections on Health Services. London Nuff Prov Hosp Trust. 1972;
2. Tacconelli E. Systematic reviews: CRD’s guidance for undertaking reviews in health care. Lancet Infect Dis. 2010 Apr 1;10(4):226.
3. Mulrow CD. Rationale for systematic reviews. British Medical Journal. 1994.
4. Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, et al. Cochrane Handbook for Systematic Reviews of Interventions. Cochrane Handbook for Systematic Reviews of Interventions. The Cochrane Collaboration and John Wiley & Sons Ltd.; 2019.
5. Institute of Medicine. Finding What Works in Health Care: Standards for Systematic Reviews. Medicine (Baltimore). 2011;
6. Koffel JB. Use of recommended search strategies in systematic reviews and the impact of librarian involvement: A cross-sectional survey of recent authors. PLoS One. 2015;
7. Li L, Tian J, Tian H, Moher D, Liang F, Jiang T, et al. Network meta-analyses could be improved by searching more sources and by involving a librarian. J Clin Epidemiol. 2014;
8. Golder S, Loke Y, McIntosh HM. Poor reporting and inadequate searches were apparent in systematic reviews of adverse effects. Journal of Clinical Epidemiology. 2008.
9. Frandsen TF, Gildberg FA, Tingleff EB. Searching for qualitative health research required several databases and alternative search strategies: a study of coverage in bibliographic databases. J Clin Epidemiol. 2019;
10. Wright JM, Cottrell DJ, Mir G. Searching for religion and mental health studies required health, social science, and grey literature databases. J Clin Epidemiol. 2014;
11. Bramer WM, Rethlefsen ML, Kleijnen J, Franco OH. Optimal database combinations for literature searches in systematic reviews: A prospective exploratory study. Syst Rev. 2017;6(1):1–12.
12. Hartling L, Featherstone R, Nuspl M, Shave K, Dryden DM, Vandermeer B. The contribution of databases to the results of systematic reviews: A cross-sectional study. BMC Med Res Methodol. 2016;16(1):1–13.
13. Vassar M, Yerokhin V, Sinnett PM, Weiher M, Muckelrath H, Carr B, et al. Database selection in systematic reviews: an insight through clinical neurology. Health Info Libr J. 2017;34(2):156–64.
14. Halladay CW, Trikalinos TA, Schmid IT, Schmid CH, Dahabreh IJ. Using data sources beyond PubMed has a modest impact on the results of systematic reviews of therapeutic interventions. J Clin Epidemiol. 2015;68(9):1076–84.
15. Aagaard T, Lund H, Juhl C. Optimizing literature search in systematic reviews - are MEDLINE, EMBASE and CENTRAL enough for identifying effect studies within the area of musculoskeletal disorders? BMC Med Res Methodol. 2016;16(1):1–11.
16. Royle P, Bain L, Waugh N. Systematic reviews of epidemiology in diabetes: Finding the evidence. BMC Medical Research Methodology. 2005.
17. Saeedi P, Petersohn I, Salpea P, Malanda B, Karuranga S, Unwin N, et al. Global and regional diabetes prevalence estimates for 2019 and projections for 2030 and 2045: Results from the International Diabetes Federation Diabetes Atlas, 9th edition. Diabetes Res Clin Pract. 2019;
18. Cramer J a. A Systematic Review of Adherence With. Diabetes Care. 2004;27(August 2003):1218–24.
19. Vanstone M, Giacomini M, Smith A, Brundisini F, DeJean D, Winsor S. How diet modification challenges are magnified in vulnerable or marginalized people with diabetes and heart disease: A systematic review and qualitative meta-synthesis. Ont Health Technol Assess Ser. 2013;
20. DeJean D, Giacomini M, Vanstone M, Brundisini F. Patient experiences of depression and anxiety with chronic disease: A systematic review and qualitative meta-synthesis. Ont Health Technol Assess Ser. 2013;
21. Booth A. Unpacking your literature search toolbox: On search styles and tactics. Health Information and Libraries Journal. 2008.

22. Bates MJ. The design of browsing and berrypicking techniques for the online search interface. Online Information Review. 1989.

23. Barroso J, Gollop CJ, Sandelowski M, Meynell J, Pearce PF, Collins LJ. The challenges of searching for and retrieving qualitative studies. West J Nurs Res. 2003;

24. Wright K, Golder S, Lewis-Light K. What value is the CINAHL database when searching for systematic reviews of qualitative studies? Syst Rev. 2015;4(1):1–8.

25. Beckles Z, Glover S, Ashe J, Stockton S, Boynton J, Lai R, et al. Searching CINAHL did not add value to clinical questions posed in NICE guidelines. J Clin Epidemiol [Internet]. 2013;66(9):1051–7. Available from: http://dx.doi.org/10.1016/j.jclinepi.2013.04.009

26. Horsley T, Dingwall O, Sampson M. Checking reference lists to find additional studies for systematic reviews. Cochrane Database Syst Rev. 2011;

27. NLM. PubMed factsheet. National Center for Biotechnology Information (NCBI) at the National Library of Medicine (NLM).

**Supplementary Data**

**Appendix 1.** Overview of included SRs and references
Table 2
Databases included and their individual and combined recall of references.

| References found (n) | Overall recall\(^a\) (%) | Median recall\(^b\) (%) | Minimum recall\(^c\) (%) | 100%\(^d\) recall (%) | Number of SRs that searched the database, n (% of the 23 SRs)* |
|----------------------|---------------------------|------------------------|--------------------------|------------------------|------------------------------------------------------------|
| CIN                  | 367                       | 80.0                   | 80.8                     | 44.4                   | CIN 20 (87.0)                                              |
| MED                  | 397                       | 86.5                   | 93.3                     | 62.5                   | MED 17 (73.9)                                              |
| PSI                  | 191                       | 41.6                   | 40.0                     | 0                      | PSI 11 (47.8)                                              |
| EMB                  | 413                       | 90.0                   | 90.0                     | 60.0                   | EMB 10 (43.5)                                              |
| PBM                  | 398                       | 86.7                   | 93.3                     | 62.5                   | PBM 8 (34.8)                                               |
| PBM/MED              | 398                       | 86.7                   | 93.3                     | 62.5                   | PMB/MED 23 (100)                                          |
| PBM + EMB            | 428                       | 93.2                   | 96.7                     | 62.5                   | PBM/MED + EMB 10 (43.5)                                   |
| PBM + CIN            | 445                       | 96.9                   | 100.0                    | 80.0                   | PBM/MED + CIN 20 (87.0)                                   |
| PMB + PSI            | 408                       | 88.9                   | 100.0                    | 62.5                   | PMB/MED + PSI 8 (34.8)                                    |
| EMB + CIN            | 449                       | 97.8                   | 100.0                    | 80.0                   | EMB + CIN 8 (34.8)                                        |
| EMB + PSI            | 425                       | 92.6                   | 92.3                     | 62.5                   | EMB + PSI 5 (21.7)                                        |
| CIN + PSI            | 392                       | 85.4                   | 86.7                     | 46.2                   | CIN + PSI 9 (39.1)                                        |
| PBM + EMB + CIN      | 456                       | 99.3                   | 100.0                    | 80.0                   | PBM/MED + EMB + CIN 8 (34.8)                              |
| PBM + EMB + PSI      | 435                       | 94.8                   | 100.0                    | 62.5                   | PBM/MED + EMB + PSI 5 (21.7)                              |
| PBM + CIN + PSI      | 448                       | 97.6                   | 100.0                    | 84.6                   | PBM/MED + CIN + PSI 9 (39.1)                               |
| EMB + PSI + CIN      | 451                       | 98.3                   | 100.0                    | 80.0                   | EMB + PSI + CIN 4 (17.4)                                   |
| References found (n) | Overall recall\(^a\) (%) | Median recall\(^b\) (%) | Minimum recall\(^c\) (%) | 100%\(^d\) recall (%) | Number of SRs that searched the database, n (% of the 23 SRs)* |
|----------------------|--------------------------|------------------------|---------------------------|------------------------|--------------------------------------------------------|
| PMB + EMB + CIN + PSI | 458                      | 99.8                   | 100.0                     | 93.3                   | 95.7                                                   |
|                      |                          |                        |                           |                        | PMB/MED + EMB+ CIN + PSI 4 (17.4)                      |

PBM = PubMed. MED = MEDLINE. EMB = Embase. CIN = CINAHL. PSI = PsycINFO.

\(^a\) Overall recall: The total number of included references retrieved by the databases divided by the total number of included references retrieved by all databases.

\(^b\) Median recall: The median value of recall per review.

\(^c\) Minimum recall: The lowest value of recall per review.

\(^d\) 100% recall: The percentage of reviews for which the database combination retrieved all included references.

*SRs that used either PubMed or MEDLINE.
 INCLUDED SRs (n = 23)  Included number of references (n = 665)

| Reference                                                                 | Included References |
|--------------------------------------------------------------------------|---------------------|
| Messina J, Campbell S, Morris R, Eyles E, Sanders C. A narrative systematic review of factors affecting diabetes prevention in primary care settings. PLoS One. 2017; | 18                  |
| Al Hamid A, Ghaleb M, Aljadhey H, Aslanpour Z. A systematic review of qualitative research on the contributory factors leading to medicine-related problems from the perspectives of adult patients with cardiovascular diseases and diabetes mellitus. BMJ Open. 2014. | 21                  |
| Majeed-Ariss R, Jackson C, Knapp P, Cheater FM. A systematic review of research into black and ethnic minority patients’ views on self-management of type 2 diabetes. Heal Expect. 2015; | 57                  |
| Rushforth B, McCrorie C, Glidewell L, Midgley E, Foy R. Barriers to effective management of type 2 diabetes in primary care: Qualitative systematic review. Br J Gen Pract. 2016; | 33                  |
| Brundisini F, Giacomini M, DeJean D, Vanstone M, Winsor S, Smith A. Chronic disease patients’ experiences with accessing health care in rural and remote areas: A systematic review and qualitative meta-synthesis. Ont Health Technol Assess Ser. 2013; | 12                  |
| Van Ryswyk E, Middleton P, Hague W, Crowther C. Clinician views and knowledge regarding healthcare provision in the postpartum period for women with recent gestational diabetes: A systematic review of qualitative/survey studies. Diabetes Research and Clinical Practice. 2014. | 13                  |
| Vanstone M, Rewegan A, Brundisini F, Giacomini M, Kandasamy S, Dejean D. Diet modification challenges faced by marginalized and nonmarginalized adults with type 2 diabetes: A systematic review and qualitative meta-synthesis. Chronic Illness. 2017. | 120                 |
| Wilkinson A, Whitehead L, Ritchie L. Factors influencing the ability to self-manage diabetes for adults living with type 1 or 2 diabetes. International Journal of Nursing Studies. 2014. | 37                  |
| Campbell F, Lawton J, Rankin D, Clowes M, Coates E, Heller S, et al. Follow-Up Support for Effective type 1 Diabetes self-management (The FUSED Model): A systematic review and meta-ethnography of the barriers, facilitators and recommendations for sustaining self-management skills after attending a structured education programme. BMC Health Serv Res. 2018; | 18                  |
| M. V, M. G, A. S, F. B, D. D, S. W. How diet modification challenges are magnified in vulnerable or marginalized people with diabetes and heart disease: A systematic review and qualitative meta-synthesis. Ont Health Technol Assess Ser. 2013; | 65                  |
| Long H, Bartlett YK, Farmer AJ, French DP. Identifying brief message content for interventions delivered via mobile devices to improve medication adherence in people with type 2 diabetes mellitus: A rapid systematic review. Journal of Medical Internet Research. 2019. | 25                  |
| Walker RC, Tong A, Howard K, Palmer SC. Patient expectations and experiences of remote monitoring for chronic diseases: Systematic review and thematic synthesis of qualitative studies. Int J Med Inform. 2019; | 16                  |
| DeJean D, Giacomini M, Vanstone M, Brundisini F. Patient experiences of depression and anxiety with chronic disease: A systematic review and qualitative meta-synthesis. Ont Health Technol Assess Ser. 2013; | 20                  |
| Reference                                                                 | Page |
|--------------------------------------------------------------------------|------|
| Vanstone M, Rewegan A, Brundisini F, Dejean D, Giacomini M. Patient perspectives on quality of life with uncontrolled type 1 diabetes mellitus: A systematic review and qualitative meta-synthesis. Ontario Health Technology Assessment Series. 2015. | 31   |
| Shaw RL, Holland C, Pattison HM, Cooke R. Patients’ perceptions and experiences of cardiovascular disease and diabetes prevention programmes: A systematic review and framework synthesis using the Theoretical Domains Framework. Social Science and Medicine. 2016. | 14   |
| Whittemore R, Jaser S, Chao A, Jang M, Grey M. Psychological Experience of Parents of Children With Type 1 Diabetes: A Systematic Mixed-Studies Review. Diabetes Educ. 2012; | 34   |
| Spencer J, Cooper H, Milton B. Qualitative studies of type 1 diabetes in adolescence: A systematic literature review. Pediatric Diabetes. 2010. | 26   |
| Zuniga JA, Wright C, Fordyce J, West Ohueri C, Garcíá AA. Self-Management of HIV and Diabetes in African American Women: A Systematic Review of Qualitative Literature. Diabetes Educ. 2018; | 14   |
| Jones E, Sinclair JMA, Holt RIG, Barnard KD. Social networking and understanding alcohol-associated risk for people with type 1 diabetes: Friend or foe? Diabetes Technol Ther. 2013; | 6    |
| Due-Christensen M, Zoffmann V, Willaing I, Hopkins D, Forbes A. The Process of Adaptation Following a New Diagnosis of Type 1 Diabetes in Adulthood: A Meta-Synthesis. Qual Health Res. 2018; | 10   |
| Saunders T. Type 2 diabetes self-management barriers in older adults: An integrative review of the qualitative literature. J Gerontol Nurs. 2019; | 10   |
| Villalba C, Jaiprakash A, Donovan J, Roberts J, Crawford R. Unlocking the Value of Literature in Health Co-Design: Transforming Patient Experience Publications into a Creative and Accessible Card Tool. Patient. 2018; | 13   |
| Van Ryswyk E, Middleton P, Shute E, Hague W, Crowther C. Women's views and knowledge regarding healthcare seeking for gestational diabetes in the postpartum period: A systematic review of qualitative/survey studies. Diabetes Research and Clinical Practice. 2015. | 52   |

**Figures**
Figure 1

Flow diagram of the data collection process. 1 Two SRs (19,20) included 85 references in total, but listed only 80 references in the reference lists. 2 References included in more than one SR. COPD = chronic obstructive pulmonary disorders. HIV = human immunodeficiency virus
Figure 2

Number of databases searched by SRs on qualitative research regarding diabetes mellitus.
Figure 3

Database frequency in the 23 SRs included.