

Université de Montréal

Type 2 Diabetes Peer Support Interventions as a Complement to
Primary Care Settings in High-Income Nations: A Scoping Review

Par

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Ce mémoire intitulé

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Résumé

Contexte : Les programmes d'éducation à l'autogestion du diabète (DSME) pour les patients atteints de diabète de type 2 (DT2) risquent de leur être insuffisants à long terme sans un soutien social adéquat. Il est nécessaire d'envisager des initiatives de soutien par les pairs pour compléter et soutenir la prestation actuelle de la DSME dans les établissements de soins primaires afin de fournir un soutien social continu aux personnes ayant des besoins complexes non satisfaits.

Objectifs : Étant donné qu'il n'y a pas de « modèle unique », l'objectif est d'explorer l'étendue des interventions de soutien par les pairs pour le DT2 dans les pays à revenu élevé en termes de modèles et d'impact, de perspectives des parties prenantes et d'informations contextuelles.

Méthodes : Une étude de portée a été effectuée sur la littérature publiée et grise issue de quatre bases de données bibliographiques électroniques entre janvier 2007 et janvier 2021. Les études ont été examinées indépendamment selon la méthodologie d'Arksey et O'Malley (2005) et Levac et al. (2010), puis vérifiées par deux examinateurs.

Résultats : Parmi les cinq modèles de soutien par les pairs (soutien en face à face, soutien par téléphone, coaching entre pairs, soutien virtuel et agents de santé communautaires) recensés dans les 70 documents retenus, avec une concentration d'études aux États-Unis et au Royaume-Uni, le soutien en face à face et le soutien par téléphone semblent les plus prometteurs, avec la plus grande couverture de preuves scientifiques sur les issues du DT2. Les données expérientielles venaient de patients DT2, de pairs aidants, de professionnels de la santé et de gestionnaires de programme. Onze facteurs contextuels clés (recrutement et sélection, définition du rôle, formation, reconnaissance, supervision, rétention, rémunération, lieu, portée, analyse des coûts et fidélité de l'intervention) ont été identifiés comme importants pour la mise en œuvre de ces dispositifs de soutien par les pairs.

Conclusions : L'intervention de soutien par les pairs pour le DT2 devrait être considérée comme un levier pour la gestion du DT2 en favorisant la participation communautaire et la collaboration intersectorielle.

Mots-clés : diabète de type 2, soutien par les pairs, éducation à l'autogestion du diabète.

Abstract

Context: Diabetes self-management education (DSME) programs for type 2 diabetes (T2D) patients may not suffice for long-term management without adequate social support. There is a need to consider peer support initiatives to complement and sustain the current delivery of DSME in primary care settings in order to provide ongoing social support for those with unmet complex needs.

Objectives: Given the no “one size fits all”, the aim is to explore the breadth of T2D peer support interventions in high-income nations in terms of their models and impact, stakeholders’ perspectives, and contextual information.

Methods: A scoping review was conducted on published and grey literature found in four electronic bibliographic databases between January 2007 to January 2021. Studies were independently reviewed as per Arksey and O’Malley’s (2005) methodology and Levac et al. (2010) enhancements, and later verified by two reviewers.

Results: 70 records were included with research designs concentrated in USA and UK. Among the five peer support models (face-to-face self-management programs, telephone-based peer support, peer coaching, online-based peer support, and community health workers), face-to-face self-management programs and telephone-based peer support seem the most promising with the largest coverage of scientific evidence on T2D outcomes. Experiential data on the endorsement of such intervention emerged from T2D patients, peer supporters, healthcare professionals and program managers. Eleven key contextual factors (recruitment and selection, role definition, training, recognition, supervision, retention, remuneration, venue, reach, costing analysis and intervention fidelity) were identified as important for implementation consideration.

Conclusions: T2D peer support intervention should be considered as a leverage for T2D management by fostering community participation and intersectoral collaboration.

Keywords : type 2 diabetes, peer support, diabetes self-management education

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List of Acronyms and Abbreviations

CHW : Community health workers

CLSCs : Local community services centres

DSME : Diabetes self-management education

HbA1c : glycated hemoglobin/diabetes control marker

HSSC : Health and social services centres

HTA : Health technology assessment

IHSSC : Integrated health and social services centres

INESSS : Institut national d'excellence en santé et en services sociaux

IUHSSC : Integrated university health and social services centres

PGs : practice guidelines

PRISMA : Preferred Reporting Items for Systematic Reviews and Meta-Analyses

RCTs : Randomized controlled trials

R-FMG : Super clinic

T1D : Type 1 diabetes

T2D : Type 2 diabetes

To all my patients who believe in living well with diabetes

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Lastly, I wish to thank my sister who has always been by my side regardless.

Preface

Fostering self-care is a key strategy to manage chronic diseases and lessen the burden on the health care system (1). Despite the provision of self-management programs offered by the healthcare organizations, users of health services are often equipped with knowing what needs to be done but are often left on their own to translate knowledge into practice, and to adapt to a complex array of demands in managing their chronic conditions (2). A number of studies examining effective management point to having social support as an important ingredient for better chronic disease self-management and that a lack of effective social support is known as a risk factor for inadequate self-care practice and suboptimal health and mental well-being (3–5).

In a context of shortage of health resources, peer support can be part of the solution in complementing and sustaining the current delivery of chronic care services in order to provide the kind of ongoing social support for those in need (2). In general, peer support is considered, in a non-hierarchical way, as the reciprocal sharing of experiential knowledge between at least two individuals bearing similar hardship to support each other (6–9).

There are various types of peer support and it can occur in different settings ranging from healthcare to community-based context (7). For instance, over the last decade within Québec's healthcare setting, the Montreal Model has been renowned for its patient partnership model in prominently shifting the face of the patient care from paternalistic to patient-centered and to the latest notable model known as the patient-as-partner approach (10,11). Endorsed by the University of Montreal's Faculty of Medicine, the patient-as-partner approach acknowledges a patients' experiential knowledge and integrates the patient as "a bona fide member of the health care team" (10, p1). Trained peer supporters, known as accompanying patients, could be called upon to assist the patient in making informed decisions and in the development of their self-care competency (11,12). In order to further harness the potential role of trained peer supporters within the healthcare organizations, Pomey et al (2021) recently developed a significant research protocol to mark the collaboration with six health care organizations in Québec in order to study

the uncommon integration of trained peer supporters, known as patient advisors, as full-fledged members of the oncology health care team (13).

In a context of transitioning healthcare system to better respond to frequent users of health services (14), there is also a need to consider the role of peer support outside the healthcare organizations for those with unmet complex needs who tend to “pass under the radar” and are hardly reached by the health care services (15). In this way, from a public health perspective, peer support is also a means to solicit the participation of the community and advocate for the role of social responsibility to promote well-being and lessen the burden on the organisation of healthcare. To date, there is increasing interest in considering peer support services in high-income nations (16). In Canada, for instance, in the domain of mental health and addictions, community-based peer support initiatives exist from nationwide initiatives, such as the *Alcoholics Anonymous* and the *Canadian Mental Health Association*, to provincial initiatives, such as the *AMI-Québec’s* and the peer run agency *Peer Support Workers Association* (17–20). To further highlight the advanced development of peer support in this domain, the Faculty of Medicine at the University of Montreal has been recognized as offering the first credited medical training program for those with experiential knowledge who are interested in becoming peer support mentors (21). Furthermore, other types of community-based peer support initiatives for other chronic diseases exist such as the telephone-based peer support (ex. *Self-Management Health Coach Program* for chronic diseases in British Columbia), the peer coaching program (ex. *Live Well* for chronic diseases in New Brunswick), and the online-based peer support (ex. *Virtual Self-Help Group* for respiratory diseases and *CancerConnection* community in Québec) (22–24). In particular, some initiatives exist for the management of type 1 diabetes (T1D) such as the peer coaching program (ex. *Type 1 Buddies* in Ontario or *TalkT1D* across Canada from Juvenile Diabetes Research Foundation) (16) , the emergent online-based peer support (ex. *VPN – T1D (Virtual Patient Network)*), and the peer-based groups (ex. *College Diabetes Network (CDN)* for T1D at University of Toronto) (25). Apart from the services offered by the *McMaster Optimal Aging Portal* , which includes offering peer support to help blood glucose control for type 2 diabetes (T2D) (26), this kind of initiative seems to be far from mainstream compared to T1D peer support.

Currently, there is a worldwide increasing trends of T2D among high-income countries in North America (27). A focus on Canada reveals the economic and health ramifications of T2D, which calls for a need to advocate for peer support initiatives for T2D as one way to integrate community action for a more effective chronic care strategy beyond the health system. In an attempt to promote T2D peer support initiatives for the management of chronic diseases as a complement to the existing primary healthcare efforts, and given the no “one size fits all”, there is thus a need to examine what exists, for whom, where and when. As Canada is considered a high-income nation, lessons learned from other high-income countries may help inform ways to adapt and contextualise T2D peer support initiatives. Hence, this paper will address specifically peer support interventions for T2D in high-income nations.

Chapter 1 – Introduction

In the context of diabetes management, peer support is defined as the sharing of experiential knowledge between diabetic individuals with similar characteristics and age (5). It is used to foster adequate self-care in diabetes by involving the provision of practical strategies to overcome daily challenges, “social and emotional support, and linking to clinical care and community resources” (28). The main gain is that this social support is “ongoing, flexible and extended over time” (28) by leveraging community participation to help promote diabetes management as an adjunct to traditional diabetes self-management education (DSME).

This thesis focuses on the management of Type 2 diabetes (T2D) unless specified otherwise. T2D is high blood glucose caused by the body’s decreasing production or inefficient usage of the hormone insulin. If left uncontrolled, fatality prevails via increased risks of macro- and micro-vascular complications such as heart disease, kidney failure, nerve damage, amputations and vision loss (29). In Canada, 9 out of 10 diabetics are of type 2 (30). By 2022, the incidence of diabetes could increase Canada’s direct healthcare costs from \$12.3 to \$15.4 USD billion (31), while indirect costs could amount to almost \$14 USD billion per year due to projected loss of work productivity within the next decade (32). Diabetes spares no region in Canada and has been regarded as a preoccupied chronic disease in Québec due to increase in sedentary lifestyle and poor dietary habits (33).

The Québec’s integrated health and social services centres (IHSSC) and integrated university health and social services centres (IUHSSC) are responsible for providing preventive and curative services to ensure the health and well-being of the population (33,34). In accordance with its population-level responsibility, the implementation of a cardiometabolic risk intervention program in six of the twelve health and social services centres (HSSC) in Montreal (Québec) in 2011 was an example of strategically laying out several publicly-funded DSME programs to promote T2D self-care. These programs consist of interdisciplinary T2D one-on-one counselling and/or group educational interventions to develop patients’ diabetes-related knowledge, to change dietary and exercise habits, and to control diabetes clinical outcomes known to influence the risks of complications (35). To date, DSME programs proliferate across 13 local community

services centres (CLSCs) in Montreal amongst a total of 52 in CLSCs across Québec. There is also one Super clinic (R-FMG) in Montreal offering this service (36).

Currently, several limitations of DSME programs have been noted. Firstly, there is a growing concern that DSME programs for T2D patients may not suffice for the long-term management of diabetes. For instance, program benefits were rarely maintained after 3 months post-intervention and improvement of diabetes control marker (HbA1c) only lasted 6 months post-intervention (37). Secondly, there is underutilization of DSME programs despite them being publicly-funded as evidenced by the low attendance rate according to several local descriptive studies (38–40). For instance, when comparing a Western region to an Eastern region in Canada, it was observed that 31% (632/2062) of invited diabetic patients (unspecified type of diabetes) never attended the DSME programs in Manitoba (39), and 79.4% (36,985/46,553) of patients with newly diagnosed any type of non-gestational diabetes never attended the DSME programs in Ontario (38). In Montreal, it was noted that 60.1% (1689/2810) of T2D patients participated at the roll-out of DSME programs in 2011. However, the drop-out rate was as high as 40% at 12 months post-intervention because participants perceived the program to be too lengthy (41). Furthermore, when examining the characteristics of program non-attendees versus attendees, the demographic data did not provide a clear profile of service users across the Canadian provinces. For instance, older, poorer and retired attendees were observed in Manitoba (39) whereas older, poorer, sicker and recent immigrants tended not to attend DSME programs in Ontario (38). On the other hand, participants in Montreal (Québec) were often older, well-educated and presented no comorbidities (41). Lastly, there may be doubt on whether the provision of DSME is effectively reaching all T2D patients. A further examination of the reasons for non-attendance of DSME programs pointed to Horigan et al's (2017) systematic review that reflected a proliferation of worldwide interest on this complex, common "no-show" phenomenon towards DSME programs (42). The review examined a total of 12 studies -7 quantitative and 5 qualitative designs- from 2005 through 2015. It offered a descriptive overview of the non-attendance reasons provided by two groups of patients (42). For instance, patients who could not attend DSME programs reported logistical (ex. programs were too long, the venue was too far or no parking) and medical reasons (ex. require assistance in order to attend the programs) (42). Moreover, patients who choose not

to attend DSME programs reported emotional (ex. “fear of excessive demands” or “not wanting anyone to know they had diabetes”) and cultural (ex. “literacy, language and cultural issues”) reasons (42, p.22) . Overall, this indeed calls for a need to additionally support and complement service delivery in the context of limited healthcare resources and especially for those with unmet complex needs who tend to be frequent users of health services (14).

The emerging suggestion of extending the benefits of T2D self-management education with social support paves the way for peer support model in the delivery of DSME not only in primary care but also in community-based settings (43). However, as previously mentioned, given the no “one size fits all”, there is a need to explore the breadth of this promising intervention prior to mobilisation of competing resources (44).

In studying the various types of knowledge synthesis, four types of reviews (narrative, systematic, rapid and scoping) were examined before choosing the most suited research design for this thesis. The choice was essentially based on the depth, breadth, and the level of scientific rigor in which each type of reviews can provide. For instance, a narrative review provides the widest breadth of information but does not go much in depth. In fact, it has the lowest scientific rigor as it lacks a clear and rigorous methodology making it difficult for reproducibility. On the other hand, a systematic review - known for its explicit and rigorous methodology - provides a narrow breadth of information but at great depth. Indeed, both a rapid and scoping reviews have a lower level of scientific rigor compared to a systematic review. In terms of breadth and depth, a rapid review provides the narrowest form of information synthesis both in breadth and depth, and is most often employed to help a specific end user make decisions under time constraints. A scoping review, however, provides a wider breadth than the rapid and systematic review, and considers information at a greater depth than a narrative review (45). Given a need to consider a research design that can provide an explicit, rigorous, and reproducible methodological framework that can not only help explore the breadth of T2D peer support initiatives but also provide a substantially enough of depth to inform decision-makers, a scoping review was therefore chosen as a systematic approach due to its potential in providing a balanced of breadth and depth of information and in mapping out key concepts for design and implementation considerations. Therefore, to reiterate “scoping reviews are a form of knowledge synthesis, which incorporate a

range of study designs to comprehensively summarize and synthesize evidence with the aim of informing practice, programs, and policy and providing direction to future research priorities” (31, p1291).

Prior to commencing this study, there was a need to know whether a review has already been published for a similar research interest, that is, on T2D peer support initiatives as a complement to primary care settings. A preliminary search for past or ongoing reviews on T2D and peer support was conducted on several open-access online database systems: International prospective register of systematic reviews (PROSPERO), Joanna Briggs Institute (JBI) Evidence Synthesis, and Open Science Framework (OSF). The following keywords and search equation were used: [peer support AND type 2 diabetes].

As a result, in PROSPERO, only one systematic review and meta-analysis by Werfalli et al. demonstrated similar research interest (47), and the results were recently published (48). However, in line with the purpose of a systematic review, Werfalli et al’s aim was to study the effectiveness of a specific T2D peer support model, particularly, a T2D community-based peer-led DSME program, whereas the scoping review for this thesis has a broader focus in examining all the possible T2D peer support initiatives. The authors also examined several clinical, self-management behavioural, and psychological outcomes that will be similar to this scoping review. However, this scoping review will also compensate for the lack of study in stakeholders’ perspectives and contextual information in relation to T2D peer support interventions, which are considered important for decision making. Moreover, Werfalli et al’s study context only targeted primary care setting, community health centres or clinics in low- and middle-income countries. As previously mentioned, given the health and economic burden of T2D in Canada, there is also a need to learn from other high-income countries facing similar T2D management challenge to better adapt and contextualise T2D peer support interventions. Therefore, this scoping review will differ in that the findings may help to better inform primary care or community-based settings in high-income countries due to a review that will synthesize knowledge from high-income nations. Furthermore, Werfalli et al’s study only included experimental designs for the systematic review, which would differ from this thesis that will broaden the types of included evidence sources for the scoping review.

Overall, the aim of this scoping review is to explore the breadth of T2D peer support interventions in both primary care and community-based settings in order to complement the existing healthcare efforts in the delivery of DSME in high-income nations. This knowledge synthesis contributes to existing knowledge by identifying knowledge gaps for certain peer support modalities for T2D and contextual factors for sustainable practice. The findings support stakeholders, who are interested in developing peer support initiatives for T2D, to learn more about the existing peer support models, their endorsements and the contextual factors to further explore site-specific options.

The following chapter presents the study goal and review questions. The scoping review methodology is described in chapter 3. Chapter 4 presents the results followed by its discussion in chapter 5. Chapter 6 concludes this thesis with the implications of the findings for research and practice.

Chapter 2 – Research Questions

The aim of this study was to lay the necessary groundwork by exploring the extent of the literature on peer support initiatives for T2D in terms of their models and impact, endorsement, and contextual information; and to identify knowledge gaps to better inform stakeholders such as decision-makers, service planners, and healthcare professionals who are interested in developing peer support initiatives for this population in the context of primary care or community-based setting.

Three overarching research questions were examined:

- I) What types of evidence exist concerning peer support models and their impact on T2D?
- II) What is the point of view about T2D peer support intervention as an adjunct to the existing DSME programs from the perspective of key stakeholders?
- III) What contextual information are described for each type of implemented peer support model in primary care settings?

Chapter 3 – Scoping Review Methodological Framework

A prior scoping review protocol was developed and made available on OSF prior to commencing the scoping review itself. (49). This chapter presents the study design adopted as per Arksey and O'Malley's iterative five-stages framework (50) combined with Levac et al.'s enhancements (51), and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) (52).

3.1 Search Strategy

A set of three search strategies was developed in collaboration with a reference librarian across 4 electronic databases: MEDLINE, EMBASE, CINAHL Plus with full text, and Web of Science Core Collection. All search activities were saved in each database search history and can be tracked for transparency and reproducibility. For information on search equations in all databases, see Appendix I: Search strategy. The snowballing technique was also performed to ensure the most comprehensive review. Published studies of all research designs and literature reviews in journals, monograph, e-book, and reference work were reviewed. In addition, grey literature such as conference proceeding, whitepaper, dissertation or thesis, and government documents were examined. Materials in languages other than English or French were excluded due to translation cost and time. The span of resources was limited from January 2007 until January 2021. The search start year at 2007 was chosen after an initial search on Web of Science Core Collection that yielded citation statistics reflecting an increasing research interest in peer support and diabetes as shown in Figure 1. Following the search, all identified citations were collated and uploaded into Covidence for duplication removal and screening. Mendeley was used to manage citations.

Total Publications

398 Analyze

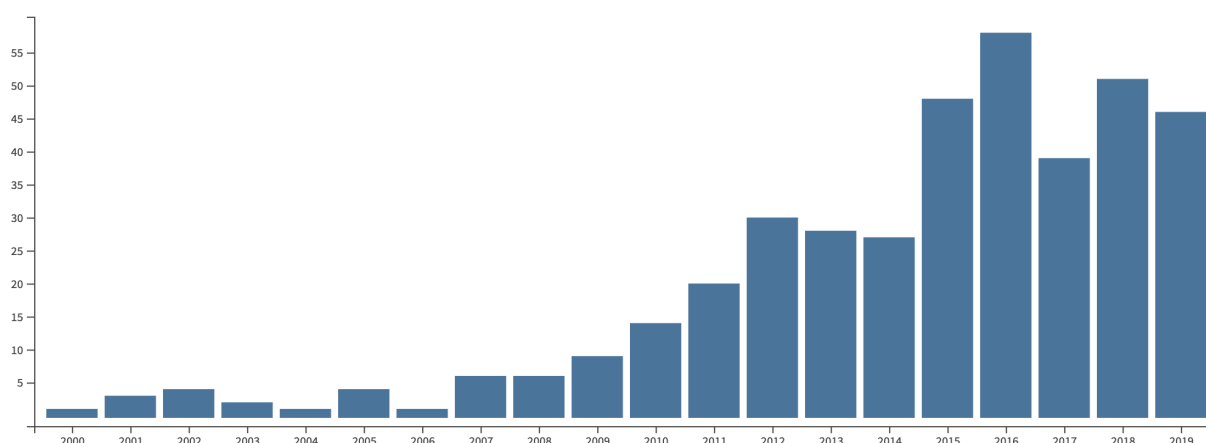


Figure 1. Citation report

Note : This citation report yielded 398 results from a topic search (abstract + title) with basic terms “peer support” and “diabetes” from Web of Science Core Collection (2000 to 2019).

3.2 Inclusion and Exclusion Criteria

The inclusion criteria were: (1) study participants: adults ages 18 and over who are patients or peer supporters with T2D, or physicians, healthcare professionals, and managers involved in diabetes care service; (2) concepts of interest: all peer support models involving peer support that fits the definition of sharing experiential knowledge between diabetic individuals with similar characteristics and age (5); (3) Outcomes of interest: efficiency (clinical and psychological impact); stakeholders’ perspectives (needs, expectations, acceptability); applicability (culture, values, socio-demographic profile); costs; accessibility (potential reach); (4) Setting: primary healthcare, community-based, high-income countries.

The exclusion criteria were: (1) no diagnosis of T2D or unspecified type of diabetes; (2) interventions unrelated to T2D and peer support or results not solely on T2D; (3) studies not reporting on the desired outcome(s) for the review; (4) studies with insufficient information on peer support intervention and without the author’s clarification.

3.3 Study Selection

This stage is a two-step process: 1) abstracts and titles were screened based on the eligibility criteria, and 2) full documents were requested for all relevant materials and were assessed for final inclusion decision. The World Bank classification of country 2019 (53) was used to identify studies from high-income nations. A perusal of ambiguous materials was clarified with full documents and follow-up with authors. The study selection process was conducted independently using Covidence by the primary author (SL) and verified by the two other authors (GM and NL). No discrepancies were identified, otherwise would be resolved through an agreement process.

3.4 Data Extraction

A charting template was developed independently on an Excel spreadsheet, piloted on three included studies and verified by another author (GM). In order to avoid data extraction by randomness, the development of the charting template was based on planning what information should be extracted.

To do so, first, there was a need to define the concept of peer support for the subject of this thesis given the broadness of the definition of the term *peer support* and its usage in various domains. As seen earlier in the introductory section, Brownson and Heisler (2009)'s definition of peer support was used to at least contextualise the concept in the context of diabetes management (5). It is noteworthy to mention that this definition is in line with the views of other experts who endorse for peer support initiatives in the domain of diabetes (8,28,54). The definition was also supplemented with the core functions of peer support as described by Peers for Progress, which is a program developed by the American Academy of Family Physicians Foundation since 2009 following a discussion among over 20 countries at the World Health Organization meeting to advocate for diabetes prevention and management (55).

Second, peer support can take on various forms of exchange (ex. in person, by phone, online, one-to-one, or in support groups), in multiple settings (ex. primary care settings, community organization, home, or public spaces), and via different service providers (healthcare system or

community-based organization). Peer support can also integrate peer supporters with various core functions (ex. “assistance in daily management, social and emotional support, linkages to clinical care and community resources, or ongoing support, extended over time” (28)) with flexible status of engagement (ex. volunteer or worker) in an informal or formal (ex. training required) structure (2). Given its flexibility, there was a need to be able to identify the existing peer support initiatives for T2D for the goal of this study. Heisler’s (2009) classification of peer support models was used as a framework to examine the available types of T2D peer support models (56). This classification was chosen because it was developed in the spirit of advocating peer support for the management of chronic diseases as a complement to healthcare efforts.

Lastly, given the broad coverage of the types of evidence sources, there was a need to be able to extract pertinent data to answer the above research questions. The data synthesis process model from the Institut national d’excellence en santé et en services sociaux (INESSS) as shown in Figure 2 has been used for collecting data in the context of health technology assessment (HTAs) and practice guidelines (PGs) in order to triangulate scientific data with contextual and experiential data to better adapt recommendations in social sciences (57). For this research, this methodological tool provided some examples of certain outcomes that need not be overlooked when extracting data. For instance, information related to clinical, self-management behavioural, and psychological outcomes were important to consider for the first research question that dealt with T2D study outcomes associated with various T2D peer support modalities. Moreover, information related to adoption, acceptance or usability were also important to consider for the second research question that dealt with stakeholders’ perspectives on T2D peer support interventions as an adjunct to the existing DSME programs. Furthermore, information related to applicability, feasibility and accessibility were important to consider for the last research question that dealt with implementation factors.

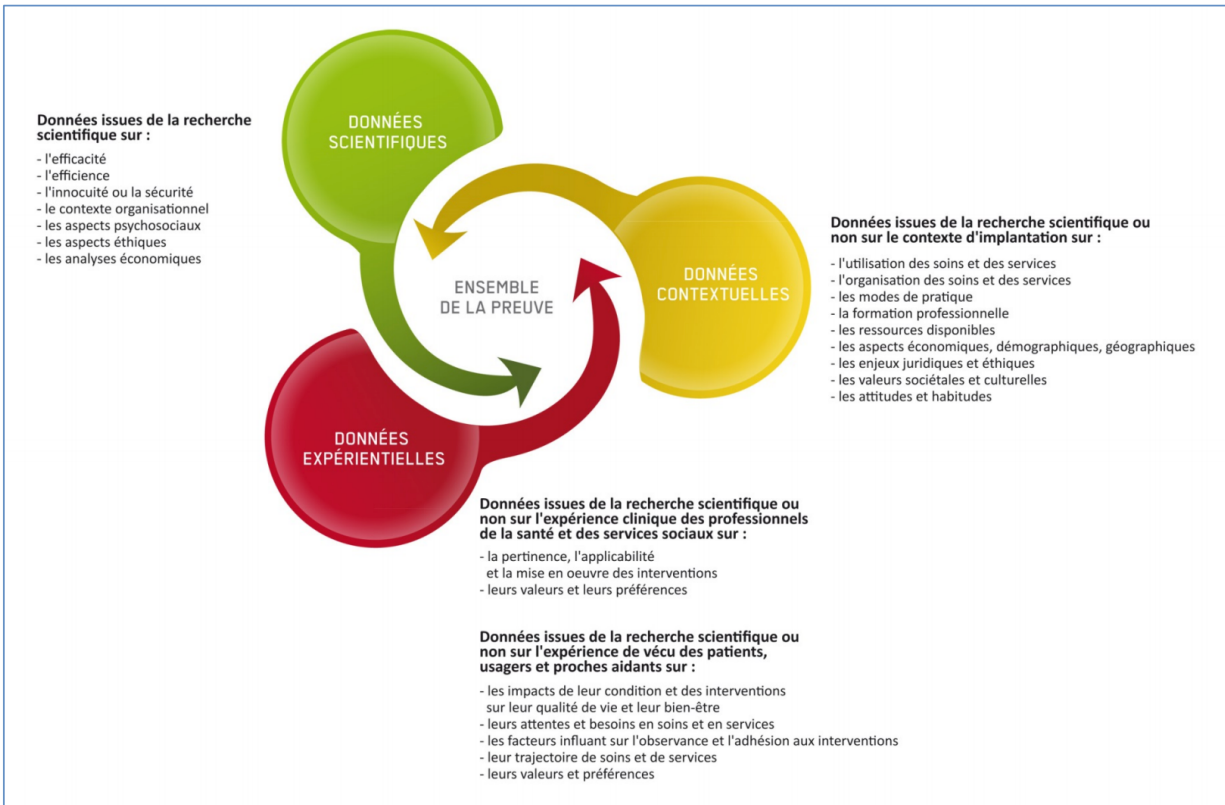


Figure 2. Data synthesis process

Note : Reproduced with permission from Institut national d'excellence en santé et en services sociaux (INESSS). Élaboration et adaptation des guides de pratique [Development and adaptation of practice guides]. Rapport rédigé par [Report written by] Christine Lobè, Jolianne Renaud, Joëlle Brassard et Monique Fournier. Québec, Qc : INESSS, 2017; 94p. Figure 4, Processus de synthèse des données [Figure 4, Data synthesis process]; p. 35. French.

Overall, data extracted from the included studies were: author(s), year, study location, types of evidence sources, aims of study, study design, study populations, study setting, method of recruitment, peer support intervention models discussed, intervention group sample size, comparator (if any), duration of the intervention, duration of follow-up, meeting timeframe, actual contact frequency between the peer educator and participant, T2D study outcomes (clinical/self-management behavioural/psychological) associated with peer support modality, participants' perspectives on peer support intervention (adoption/acceptance/usability), implementation factors (applicability/feasibility/accessibility), important results,

conclusions/recommendations. All data were extracted by the primary author (SL) and validated by the two other authors (GM and NL). No discrepancies were identified, otherwise would be resolved through an agreement process.

3.5 Collating, Summarizing and Reporting the Results

A simple count analysis was done to present the patterns of the included studies in terms of yearly records, study locations and common T2D peer support models. The diabetes outcomes of interest (clinical, self-management behavioural and psychological) associated with each T2D peer support model were reported according to the types of evidence. Narrative summaries were provided for qualitative data about the point of view of key stakeholders on T2D peer support interventions. Gillings School of Global Public Health's *Peers for Progress* program development guide (58) was used to identify key contextual factors for program development (recruitment & selection, role definition, training, and recognition), implementation (supervision, retention, remuneration, venue, and reach) and evaluation (costing analysis and intervention fidelity). The contextual factors were listed and later reported as gap analysis related to T2D peer support implementation.

Lastly, the combined results of the three review questions were integrated to produce a visual representation as recommended by Lockwood et al (2019) (59) and Peters et al (2015, 2021) (60,61), highlighting the scoping review outcomes and number of relevant studies.

Chapter 4 – Scoping Review Results

4.1 Study Selection

The search strategy resulted in a total of 3363 records across all databases. An additional 5 records were identified from the snowballing technique. Once duplicates removed, 1655 records were screened and 1467 records were excluded based on irrelevant title and abstract materials. A total of 188 full-text materials were assessed for eligibility and 118 records were excluded for reasons listed in Figure 3. As a result, this scoping review included 70 records for final data extraction. See Appendix II for a summary table of included studies.

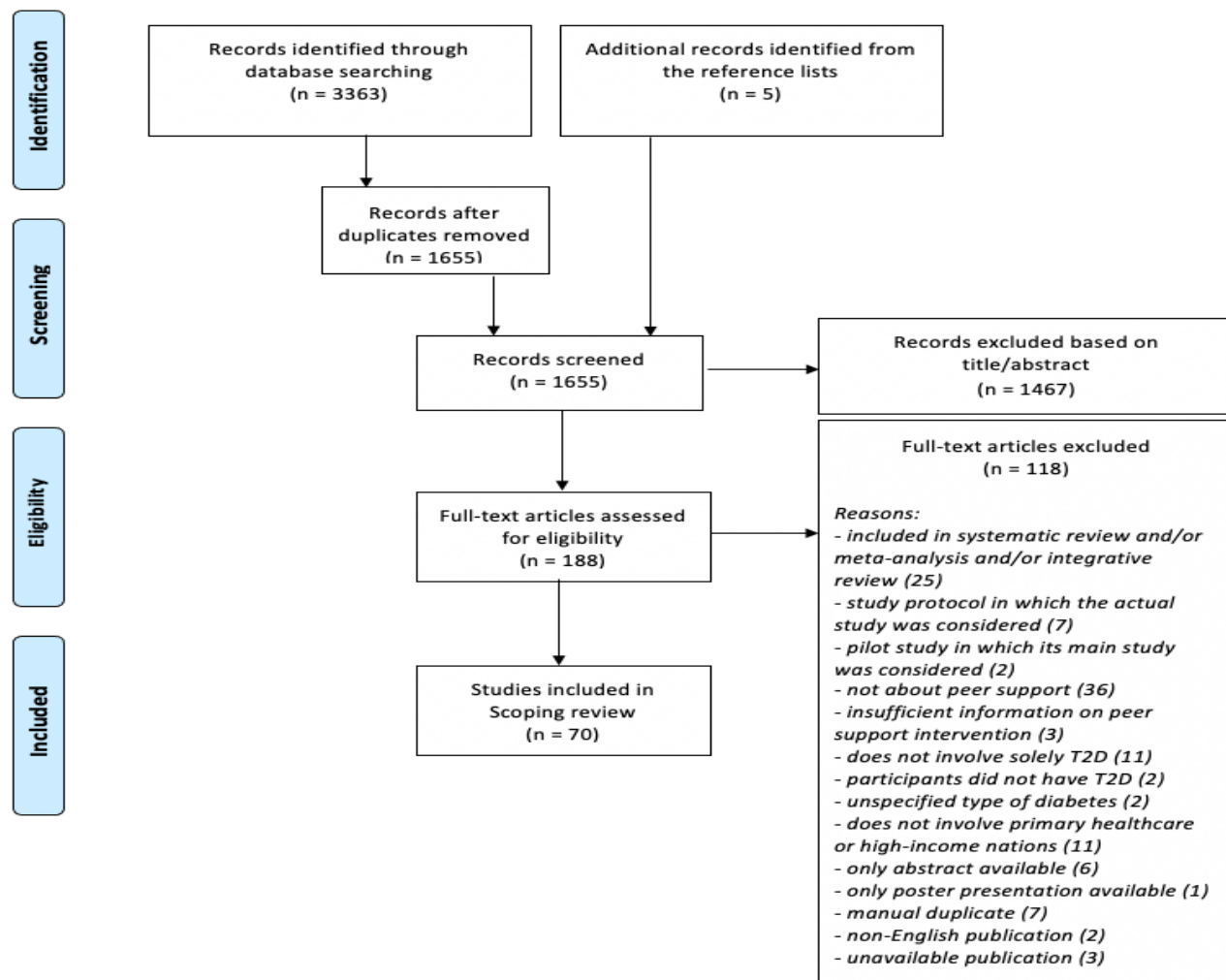


Figure 3. PRISMA flow diagram showing search strategy results

4.2 Study Characteristics

There has been a steady interest on peer support interventions for T2D over the last decade as shown in Figure 4 with six to seven records per year.

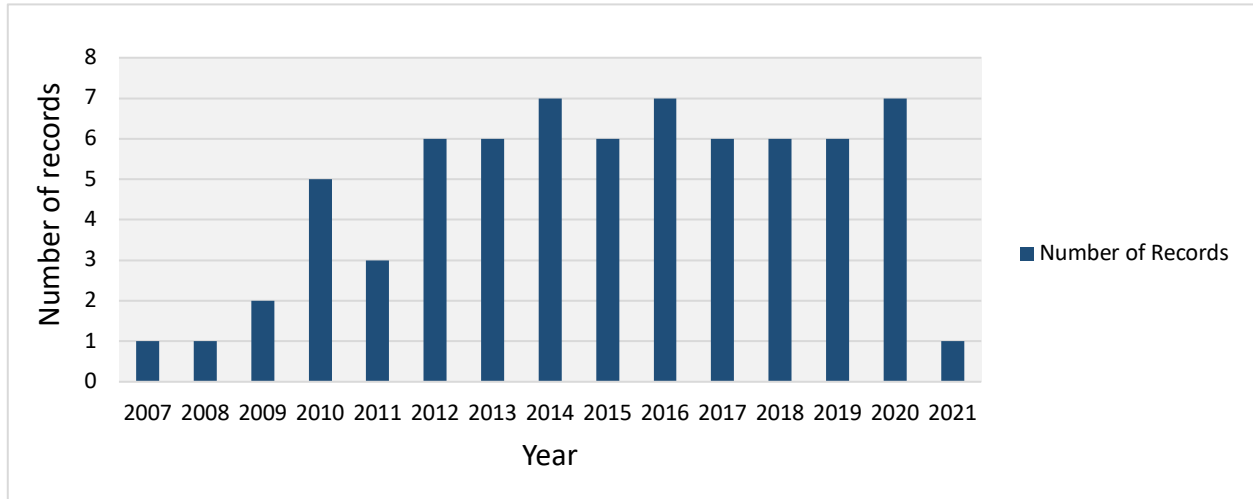


Figure 4. Number of records per year

Among the high-income nations, individual studies were conducted worldwide and were concentrated in USA ($n = 22$) and UK ($n = 11$), representing 47% of all the included studies. A large number of various types of literature review ($n = 19$) was also seen with the majority of reviewed studies conducted in multiple study locations, mostly in USA, UK and the Netherlands, when targeting high-income countries. The remaining individual studies were located in Canada ($n = 4$), Austria ($n = 1$), Ireland ($n = 3$), Netherlands ($n = 1$), Slovenia ($n = 1$), Spain ($n = 1$), Australia ($n = 3$), New Zealand ($n = 1$), Hong Kong ($n = 2$), and Saudi Arabia ($n = 1$).

4.2.1 Existing Peer Support Models

Heisler's (2006) classification of peer support models for chronic diseases were used as a framework to map the identified peer support interventions for T2D from the included studies into 5 categories (56). Given the inclusion of review articles, multiple peer support models were sometimes discussed within the same article yielding a total count of various types of peer support models examined per record to be superior than the total amount of included studies as shown in Figure 5. The frequency trend will be discussed in the following section.

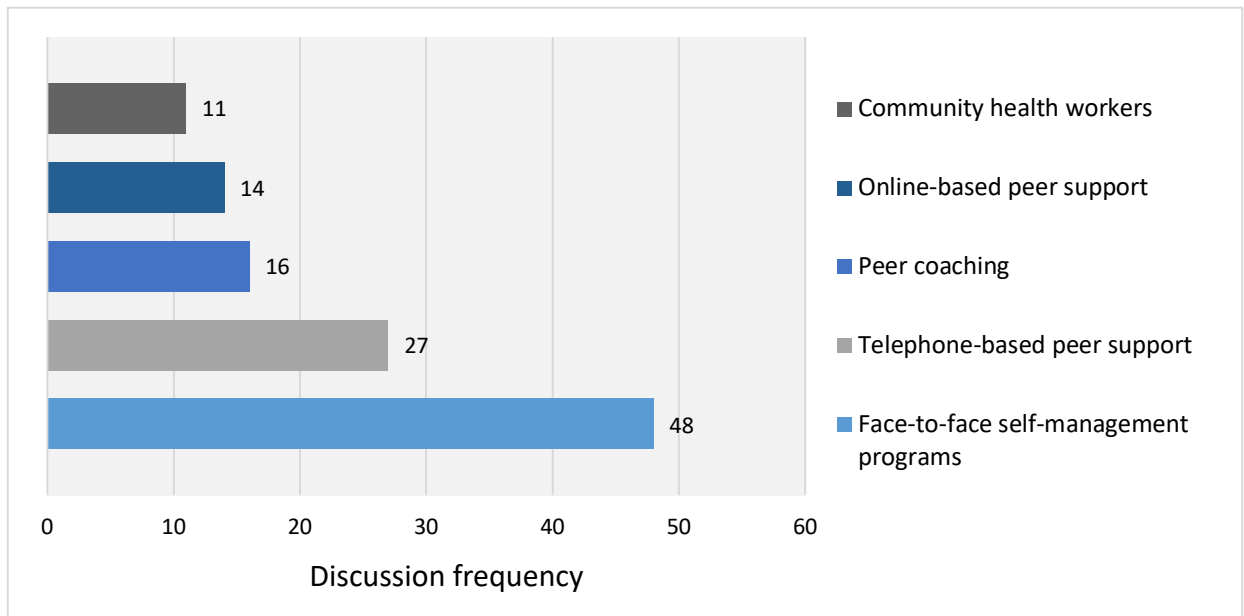


Figure 5. Peer support models, discussion frequency in included studies

4.2.1.1 Face-to-face self-management programs

Face-to-face self-management programs were the most common type of T2D peer support model discussed (n = 48) for the delivery of DSME. They were group-based and T2D peer support interventions were combined in the following ways as an adjunct to the traditional structured DSME programs:

- DSME programs + support groups (peer support between T2D patients)
- DSME programs delivered by trained T2D peer supporters independently
- DSME programs delivered by trained T2D peer supporters alongside healthcare professionals

It is important to note that trained peer supporters were either lay people with T2D (volunteers) or T2D patients who was selected by their practitioners as being adherent to treatment (good role models) and who can undergo required training.

4.2.1.2 Telephone-based peer support

The telephone-based peer support was the second most common type of T2D peer support model discussed (n = 27). It was characterised by peer support via telephone calls. The included studies often discussed this model as either 1) a standalone intervention in which peer support occurred

between T2D patients or 2) an extension to the traditional structured DSME programs in which T2D patients received subsequent phone call support from trained T2D patients or community health workers (CHW) after receiving structured diabetes education delivered by healthcare professionals. Community members usually share the same language and cultural background but not necessary the same medical conditions as patients. For the purpose of this scoping review, only CHW with T2D were considered. Moreover, some included studies also discussed mobile phone-based support that involved a mix of calling, texting or sending audio-visual messages among T2D patients (n = 4).

4.2.1.3 Peer coaching

Peer coaching was the third most common form of T2D peer support model discussed (n =16). This peer support model distinguished itself by its one-on-one counseling format with trained T2D peer supporters, also known as peer coaches or peer mentors, in an attempt to personalise support. The idea was often to pair a *successful* T2D patients with a *less successful* or newly diagnosed T2D patients to better manage diabetes. The included studies reported coaching occurred through face-to-face, phone or web-based.

4.2.1.4 Online-based peer support

The fourth and emerging form of T2D peer support model was Heisler's (2006) category web- and email-based peer support (56) that was modified in this study to be online-based peer support (n = 14) in order to encompass peer support delivered via email or message board but also other advanced communication channels such as videoconferencing; online communities such as Facebook group and forum; interactive web-based tool or health application; and virtual face-to-face self-management peer support model.

4.2.1.5 Community health workers (CHW)

The last most discussed type of T2D peer support model is the community health workers (n = 11). This peer support model engaged community members who share the same language and cultural background but not necessary the same medical conditions as patients. For the purpose of this scoping review, only CHW with T2D were considered. In this case, this peer support model involved training CHW with T2D to deliver DSME program independently or alongside healthcare

professional(s) followed by subsequent phone follow-ups. In addition, some included studies also discussed how CHW communicated with healthcare team by harnessing the potential of web-based health tools.

4.2.2 Study Designs

Inspired by DiCenso et al's (2009) 6S pyramid (62), the various types of study designs were tabulated and classified into this level of evidence pyramid in order to simply appreciate the amount of pieces of evidence that were synthesized with or without appraisal for peer support interventions and T2D. It is by no means an attempt to make any assumptions on the quality of the included studies. As shown in Figure 6, there was a total of 6 synopsis of syntheses as indicated by Health Evidence database (meta-analysis n = 2; systematic review n = 3; and systematic reviews & meta-analysis n = 1) and 5 syntheses (meta-analysis n = 1; systematic review n = 2); and systematic reviews & meta-analysis n = 2). The synopsis of syntheses refers to a short summary of information found in systematic reviews and may include comments on the methodological quality of the studies, whereas syntheses is a term used to refer to the systematic review itself. There was also a total of 43 individual studies in which the majority were qualitative study (n = 13); pre-post design (n = 7); RCT (n = 5); cohort studies (n = 4); and economic evaluation (n = 4). Lastly, the rest of included designs were mixed methods (n = 3); feasibility/pilot studies (n = 3); survey research design (n = 2); process evaluation (n = 1); non-randomized controlled equivalence trial (n = 1); literature review (n = 3); integrative review (n = 3); expert opinion (n = 7); and study protocol (n = 3). As the aim of this scoping review is to map out the available evidence, the individual studies included were not critically appraised.

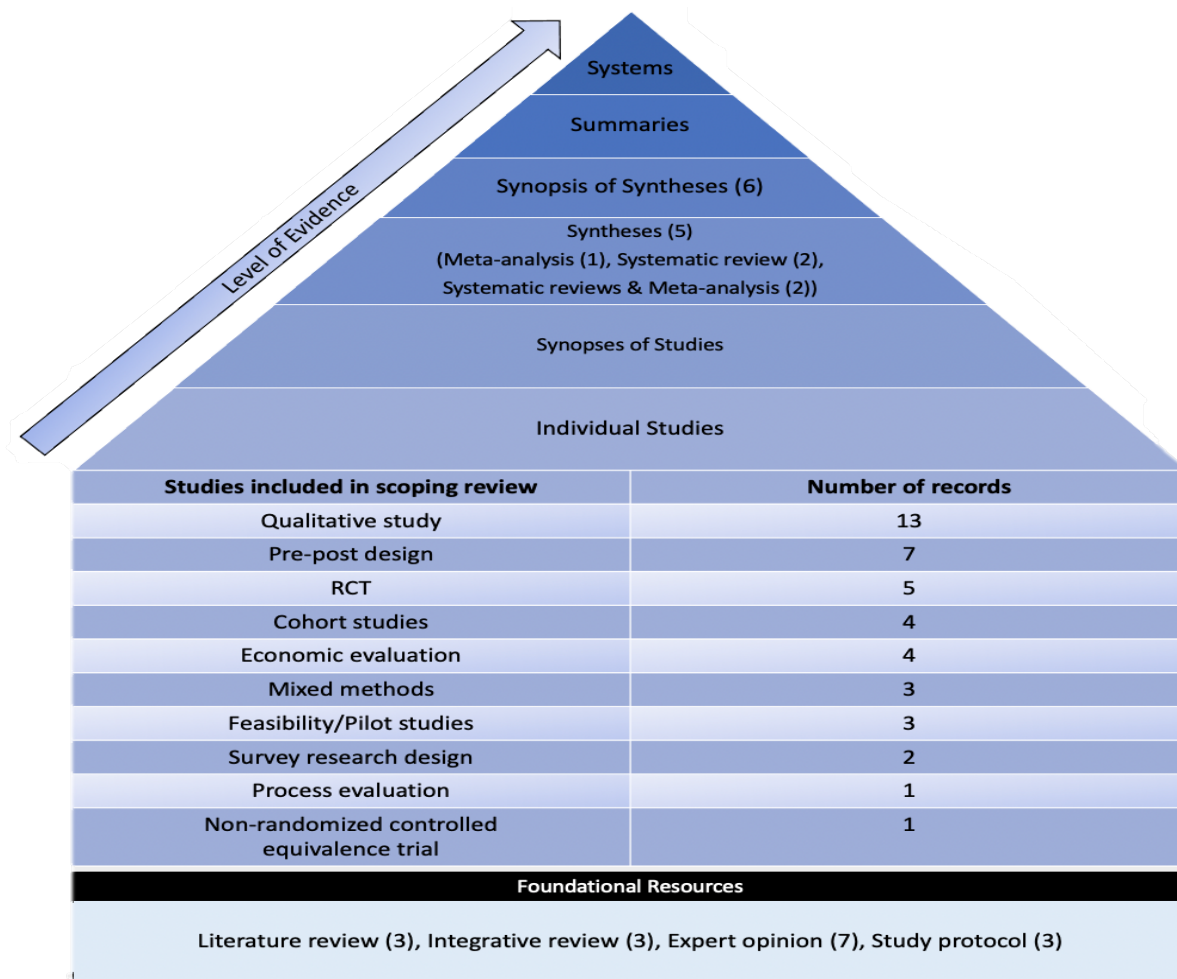


Figure 6. Types of study designs included.

Note: Adapted from “Level of evidence pyramid,” by NSW Ministry of Health CIAP, 2020, Wikimedia Commons

https://commons.wikimedia.org/wiki/File:Level_of_evidence_pyramid.png. CC BY 4.0.

4.3 Types of Evidence by Peer Support Modality and Diabetes Outcomes

The majority of included studies on **face-to-face self-management programs** provided a favorable effect on improving HbA1c (3,63–73); diabetes knowledge (63,65,67,68,71,74,75); self-efficacy (3,4,67–70,76); physical activity (3,65,67,68,77); healthy eating (3,67,68,71,77); and perceived social support (3,63,67,68,71,78,79). The overall results were mixed related to diabetes

distress (3,67,68,72,76,80–83), and metabolic parameters such as blood pressure (3,65,67,68,74,84,85), cholesterol (3,65,67,68,74,84), and BMI/weight (3,65,67,68,73,74,84).

The included studies on **telephone-based peer support** provided a favorable effect on improving HbA1c not only for patients (3,67,68,86) but also for peer supporters for up to 4 years (87). Improvement in HbA1c was observed at 6 months (64,65,73,88) or 12 months (63,66) intervention duration. The HbA1c effect seemed to be greater in the following context when:

- Combining with face-to-face contact (63,67) or online-based peer support modality (67);
- Considering frequent peer-support calls (8 or more) (64). However, more research was encouraged for intervention beyond one year (63).

In addition, the overall results of the included studies were also favorable for other diabetes outcomes such as blood pressure, cholesterol, BMI/weight (3,65,67,68,86); diabetes knowledge (63,65,67,68,86); physical activity (63,65,67,68,86); healthy eating (63,65,67,68,86); self-efficacy (3,4,67,68,76,86,88); and perceived social support (3,67,68,79,86). In terms of diabetes distress, the results were mixed (3,67,68,76,80,89).

The included studies on **peer coaching** provided a favorable effect on improving HbA1c (66,72,90–92), diabetes distress (72), and perceived social support (92). The results were mixed (92,93) related to blood pressure improvement. In this type of intervention, patients' HbA1c seemed to be influenced by peer coaches' characteristics. Apart from having a good control of HbA1c, certain peer coaches had a lower sense of self-efficacy and a higher diabetes distress. Surprisingly, these counter-intuitive psycho-social characteristics for diabetes management enabled peer coaches to better establish rapport and develop coping strategies with their peers, making them more helpful to patients in improving HbA1c (90). Moreover, the use of either a directive or nondirective style of social support by peer coaches was reported to be important in improving diabetes management. As part of characteristics of social interactions, for instance, a nondirective support is when peer coaches acknowledge recipients' feelings and cooperate with their intentions whereas a directive support is when peer coaches dictate the right options and feelings (72). More research was warranted for nondirective style due to its potential role for promoting ongoing support (72).

Although the majority of the included studies on **online-based peer support** demonstrated a favorable effect on all diabetes outcomes, they also discussed the difficulty in teasing apart the beneficial components of this type of intervention amongst other peer support modalities (3,4,67,68,94). One study concluded that there was no value-added in using for instance a web-based health tool and that ongoing social support remained the crucial determinant in outcomes improvement (92). Some authors encouraged more research to evaluate its effectiveness in hardly reached (94) and diverse (68) populations as well as in intervention above 12 months (68). Lastly, the included studies on **community health workers intervention** provided a favorable effect on improving HbA1c (66,86,91,94), and even more so in certain context that could also be apply in peer coaching intervention such as when:

- Using with poorer glycemic control patients (average HbA1c \geq 7.5% at baseline) (91);
- Combining with face-to-face self-management programs or telephone-based peer support (66);
- Providing peer support between >3 and ≤ 6 months (66).

In addition, the overall results were also favorable for other diabetes outcomes such as blood pressure, cholesterol and BMI (86); healthy eating and physical activity (86); self-efficacy (94); diabetes knowledge (86); diabetes distress (94); and perceived social support (86).

In terms of types of evidence, as shown in Table 1, face-to-face self-management programs and telephone-based peer support have been extensively synthesized and appraised in terms of their clinical, self-management behavioural and psychological impact on T2D. For emergent online-based peer support, there seemed to be a rising interest in synthesizing evidence. However, similar to community health workers (CHW), it was limited in studies that provide synopsis of synthesis related to all diabetes outcomes of interest. Lastly, although peer coaching was frequently discussed in the included studies, most studies focused on its influence on HbA1c. There seemed to be a paucity in the literature informing concretely on its impact on other aspects of diabetes outcome.

| Peer support models | Types of Evidence | | |
|---------------------------------------|---|--|---|
| | Synopses of Syntheses | Synthesis | Individual Studies |
| Face-to-face self-management programs | HbA1c (3) [*] (63) [*] (74) | HbA1c (66–68) [*] | HbA1c (83) (64,65) [*] (69–73) [*] |
| | Blood pressure (3,74) | Blood pressure (67,68) | Blood pressure (65,84,93) |
| | Cholesterol (3,74) | Cholesterol (67,68) | Cholesterol (65,84) |
| | BMI/weight (3,74) | BMI/weight (67,68) | BMI/weight (65,73,84) |
| | Diabetes knowledge (63,74) [*] | Diabetes knowledge (67,68) [*] | Diabetes knowledge (65,71,75) [*] |
| | Self-efficacy (3) [*] (74) (76) [*] | Self-efficacy (4,67,68) [*] | Self-efficacy (69,70) [*] |
| | Physical activity (3) [*] | Physical activity (67,68) [*] | Physical activity (65,77) [*] |
| | Healthy eating (3) [*] (63) | Healthy eating (67,68) ^{**} | Healthy eating (71,77) [*] |
| | Diabetes distress (3,76) | Diabetes distress (67,68,80) | Diabetes distress (72,81–83) |
| | Perceived social support (3,63) [*] | Perceived social support (67,68) ^{**} | Perceived social support (71,78,79) [*] |
| Telephone-based peer support | HbA1c (3,63,86) [*] | HbA1c (66–68) [*] | HbA1c (64,65,73,87,88) [*] |
| | Blood pressure (3,86) [*] | Blood pressure (67,68) [*] | Blood pressure (65) [*] |
| | Cholesterol (3,86) [*] | Cholesterol (67,68) [*] | Cholesterol (65) [*] |
| | BMI/weight (3,86) [*] | BMI/weight (67,68) [*] | BMI/weight (65) [*] |
| | Diabetes knowledge (63,86) [*] | Diabetes knowledge (67,68) [*] | Diabetes knowledge (65) [*] |
| | Self-efficacy (3,76,86) [*] | Self-efficacy (4,67,68) [*] | Self-efficacy (88) [*] |
| | Physical activity (63,86) [*] | Physical activity (67,68) [*] | Physical activity (65) [*] |
| | Healthy eating (63,86) [*] | Healthy eating (67,68) [*] | Healthy eating (65) [*] |
| | Diabetes distress (3,76) | Diabetes distress (67,68,80) | Diabetes distress (89) |
| | Perceived social support (3,86) [*] | Perceived social support (67,68) [*] | Perceived social support (79) [*] |
| Peer coaching | HbA1c (91) [*] | HbA1c (66) [*] | HbA1c (72,90,92) [*] |
| | | | Blood pressure (92,93) |
| | | | Diabetes distress (72) [*] Perceived social support (92) [*] |

| | | | |
|---------------------------------------|--|---|---------------------------------|
| Online-based peer support | HbA1c (3) [★] | HbA1c (67,68) [★] | HbA1c (92) (94) [★] |
| | Cholesterol (3) [★] | Blood pressure (67,68) [★] | Blood pressure (92) |
| | | Cholesterol (67,68) [★] | |
| | | BMI/weight (67,68) [★] | |
| | | Diabetes knowledge (67,68) [★] | |
| | | Self-efficacy (4,67,68) [★] | Self-efficacy (94) [★] |
| | Physical activity (3) [★] | Physical activity (67,68) [★] | |
| | Healthy eating (3) [★] | Healthy eating (67,68) [★] | |
| | Diabetes distress (67) [★] | Diabetes distress (94) [★] | |
| | Perceived social support (68) [★] | Perceived social support (92) | |
| Community health workers (CHW) | HbA1c (86,91) [★] | HbA1c (66) [★] | HbA1c (94) [★] |
| | Blood pressure (86) [★] | | |
| | Cholesterol (86) [★] | | |
| | BMI/weight (86) [★] | | |
| | Self-efficacy (86) | | Self-efficacy (94) [★] |
| | Diabetes knowledge (86) [★] | | |
| | Healthy eating (86) [★] | | |
| | Physical activity (86) [★] | | |
| | | Diabetes distress (94) [★] | |
| | Perceived social support (86) [★] | | |

Note: [★]article(s) with favorable or statistically significant outcomes

Table 1. Available evidences by peer support modality and diabetes outcomes.

4.4 The Extent of Peer Support Intervention Endorsement from Stakeholders

For T2D patients, the nature of peer support intervention embedded the notion of collectivism and was thus regarded as positive especially among the ethnic minority groups (63,81,95–97). Among the types of peer support models, face-to-face self-management programs were the most preferred due to its face-to-face and group-based key elements that enabled rapport building which fitted for collectivist cultures (81,95,97). However, one study cautioned against using a participant-driven diabetes education delivery mode for an ethnic minority group with low literacy (83). A more structured education session may place less burden on patients' not knowing

what to ask during group discussion as opposed to participant-driven approach (83). Other reasons for peer support endorsement lied in obtaining experiential knowledge from peer supporters to navigate diabetes daily challenges, linking them to healthcare resources, benefiting from emotional support and being empowered for better diabetes management (71,77–79,81,82,96–100). Overall, patients agreed on the importance of peer status attribute among peer supporters (ex. have diabetes along with similar age, gender and race) (81,95,101,102). Other relevant assets for peer supporters were having empathy, being available between medical follow-ups, offering services within the community, and having knowledge on patient confidentiality as well as peer contact etiquette (99).

For peer supporters, peer support intervention was seen as a means to help others, to boost their self-management skills and to empower themselves to better self-manage diabetes (75,82,103–105). They believe in their peer status as a crucial attribute in advising other diabetics but also in receiving adequate training for their role (77,102,103,106). Some perceived their role as less than clinician but definitely more than companion (104,107).

For healthcare professionals, there were mixed views about peer support intervention (108). Those who were in favor, acknowledged how T2D patients could benefit from the peer status component of the intervention (82). They also agreed that having empathy and listening skills were important assets among peer supporters (104). On the other hand, those who were less keen, cautioned on providing clinical support and transferring personal concerns by peer supporters (82,102,103).

Lastly, for program managers of existing peer support programs for T2D, a thorough understanding of the culture of the targeted individuals is important. For instance, T2D participants perceived peer support programs to be acceptable when their language and sociocultural background are taken into consideration. Therefore, having cultural competency was perceived as the cornerstone for program planners to support such interventions (109).

4.5 Key Contextual Factors for Peer Support Intervention

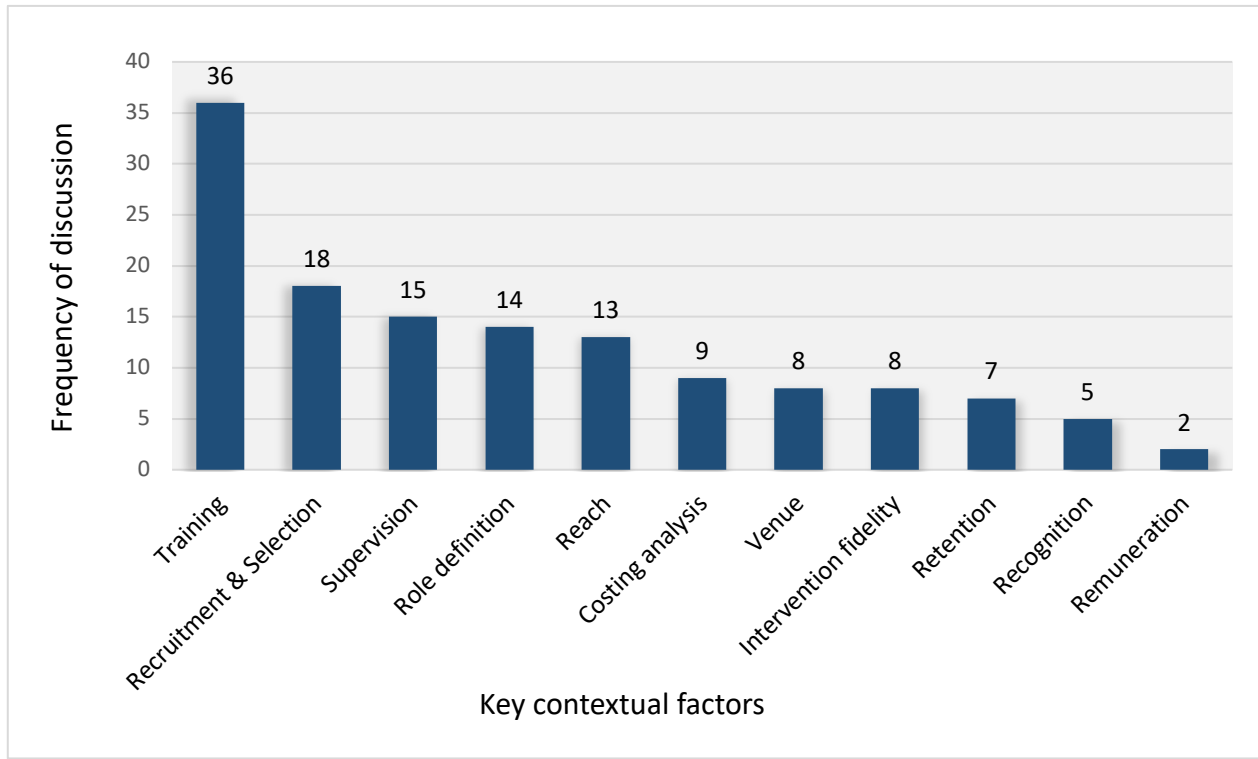


Figure 7. Key contextual factors, frequency of discussion in included studies

There were eleven key contextual factors for program development (recruitment & selection, role definition, training, and recognition), implementation (supervision, retention, remuneration, venue, and reach) and evaluation (costing analysis and intervention fidelity).

For program development, as shown in Figure 7, the most commonly discussed contextual factors were training (n = 36), recruitment & selection (n = 18) and role definition (n = 14). Details on training were available for all peer support models and more concentrated for face-to-face self-management programs and telephone-based peer support compared to peer coaching, online-based peer support or community health workers (58). Recruitment & selection process was addressed in terms of who to recruit (ex. gender-specific preferences (female peer supporters for female peers or male peer supporters for male peers) and traits (same-age and having empathy), how to recruit (ex. via entrance interview selection, online modality or community partner) and where to recruit (ex. healthcare and diabetes centers, existing peer support program, diabetes

association, community venues, neighborhood program or community-based like churches). Role definition was seen as crucial in designing training curriculum. However, only few studies (n = 5) addressed recognition as an extra step to acknowledge or certified peer supporters' training efforts.

For program implementation, supervision (n = 15), reach (n = 13) and venue (n = 8) were mostly discussed. Various healthcare professionals such as physicians, nurses, certified diabetes educators and occupational therapists were considered for the supervision of peer supporters. The potential of reaching out hardly to reach T2D patients remained a challenge leading to several venues considered for peer support intervention such as within primary care practices; outside of health setting (chosen by peer supporters familiar with local area or chosen by participants (ex. home, restaurant or coffee shop)) or in a community-based environment (local community organization, church, library or city park); or in a virtual environment. Other contextual factors seldomly addressed in the included studies were retention (n = 7) and remuneration of peer supporters (n = 2). Due to the benevolence and volunteer nature of peer supporters, the reported retention rate varied across studies. The retention strategies discussed were often related to having a formal structure in place for training, supporting, and updating peer supporters within their role. Remuneration was also discussed as a considerate way of acknowledging their time commitment and securing their engagement.

For program evaluation, two contextual factors discussed were costing analysis (n = 9) and intervention fidelity (n = 8). Information on costing analysis were reported for face-to-face self-management programs and telephone-based peer support whereas intervention fidelity was often assessed for face-to-face self-management programs and online-based peer support. Despite promising advantages of peer support interventions, a worldwide economic analysis of different peer support models is underway to ascertain its long-term feasibility. For instance, Johansson et al.'s (2016) post-hoc cost-analysis of a cluster randomized trial in Austria found a significant relationship between a 24 months group-based peer support model and reduction of length of hospital stay. This yielded a total cost savings of €4241 (equivalent to ~ 6,106 \$ CA with current currency exchange rate) per patient per year, however, the implementation costs were

excluded (110). A recent RCT economic analysis in England by Wingate et al. (2017) provided further insight into which particular peer support models were profitable. The authors analysed the extra cost associated with two peer support styles (group-based or 1:1) delivered over 8-12 months. Both methods were found to be cost-effective, at least short-term, as they help to reduce hospitalization thus lowering the overall healthcare costs. As a result, with the implementation cost included, the group-based and 1:1 peer support had a cost savings of £90.52 to £233.65 (equivalent to equivalent to ~ 130 \$ CA to 336 \$ CA with current currency exchange rate), respectively per participants per year (111). Overall, Gillings School of Global Public Health's program *Peers for Progress* reported several international cost-effective studies in favor of peer support than usual care for T2D. A takeaway message is to consider site-specific characteristics when performing economic analysis and further studies are needed to consider peer support as a business model for sustainability (112).

4.6 Combined Results of the Three Review Questions

The examination of three overarching research questions provided a broad exploration of peer support interventions and T2D. As recommended by Lockwood et al (2019) (59) and Peters et al (2015, 2021) (60,61), the result is a visual representation for presenting synthesized data across various types of evidences and identifying knowledge gaps. As shown in Figure 8, the model depicts the areas of topic coverage and the areas with limited research and those with a greater number of studies. Color codes were used to visually segregate data for T2D peer support models, data from key stakeholders, and contextual data for design and implementation considerations identified in the scoping review. Compared to the advancement of peer support initiatives in the chronic disease domain such as mental health, peer support has yet to be flourished for the domain of diabetes and even more so when addressing T2D. As represented in Figure 8, T2D peer support intervention has been explored and demanded by T2D patients. There is an increasing interest in integrating T2D peer support intervention as an adjunct to DSME programs in primary care settings (face-to-face self-management programs). Attention has also been focused in formalizing the structure of T2D peer support intervention through training T2D peer supporters but may be lacking in other important components such as recognition and remuneration to fully integrate T2D peer supporters in the workforce. However, this visual representation also points

to the opportunity to foster other venues such as community-based T2D peer support intervention, which can help balance the risk of creating paraprofessionals with the process of peer support being too formalize leading to the possible loss of its essence.



T2D: type 2 diabetes

■ T2D peer support model
 ■ Stakeholders
 ■ Contextual factors

Figure 8. Visual representation of scoping review outcomes and number of relevant studies

Chapter 5 – Discussion

The management of diabetes burden by means of implementing DSME programs is a well-intentioned strategy but may be lacking in reality due to the underutilization as well as challenge in personalizing diabetes education with ongoing social support to match the needs of T2D patients (113,114). Therefore, unsurprisingly, when exploring patients' barriers to self-management, obtaining diabetes education alone did not suffice to motivate positive behavioural change, hence the short-term effectiveness of DSME programs on glycemic control (115). As discussed earlier, there is a need to complement traditional DSME programs and given the chronicity of diabetes, self-management education should go hand in hand with social support for sustainability. T2D peer support intervention provides the means to tailor education by harvesting experiential knowledge, and to reduce health disparities by advocating T2D community participation.

Firstly, while peer support is likely to make people with T2D feel better, the question of whether they have improved clinical results becomes important if T2D peer support would be utilized as one way to complement the short-term effect of traditional DSME programs on glycemic control. Dale et al have reviewed 14 randomized controlled trials (RCTs) and reported a statistically significant association between T2D peer support interventions and improvement in various diabetes outcomes such as glycemic control, systolic blood pressure, cholesterol, BMI/weight, physical activity, self-efficacy, depression and perceived social support (3). The effect size varied from small to large for glycemic control (116,117) and from small, medium to large for depression (116,118,119). The effect size was small for BMI/weight (120,121); medium for physical activity and self-efficacy (118); and large for systolic blood pressure (122), cholesterol (119), and perceived social support (119). Overall, the benefits were not associated with any specific peer support model (3). However, over the years within less than a decade, numerous syntheses and synopsis of syntheses tapped into the beneficial effects of T2D peer support on diabetes outcomes, not only in terms of clinical but also self-management behavioural, and psychological

outcomes in the context of primary care settings in high-income nations. Upon examination of the five peer support models (face-to-face self-management programs, telephone-based peer support, peer coaching, online-based peer support, and community health workers), face-to-face self-management programs and telephone-based peer support stood out as having the most evidence in terms of their clinical, self-management behavioural and psychological impact on T2D. Peer coaching lagged behind in informing concretely on its impact on aspects of diabetes outcome other than its influence on HbA1c when compared to online-based peer support for a similar amount of evidence. Numerous studies exist for community health workers but were scarce once filtered down to those with T2D.

Secondly, this scoping study also pondered over the integration of key stakeholders' perspective, which may not always be omnipresent during a new health intervention development and implementation. The findings pointed to the endorsement of peer support intervention by T2D patients. Such intervention was seen as most pertinent amongst the ethnic minority groups with a collectivist background and thus a preference for the face-to-face self-management programs peer support model. This information is interesting for stakeholders living in Montreal's multicultural environment. There was also a lack of perspective from existing peer support program but the included single study of managers' perspectives hinted on the link between culture understanding and T2D peer support intervention structuring (109). In fact, previous studies have reported how a culturally appropriate peer support model (63) may be more effective than the conventional standardized diabetes education model because it reduces various cultural barriers by 1) tailoring education sessions to participants' native language, 2) addressing cultural values and beliefs that may compete with recommended T2D management, and 3) building upon participants' social ties to help navigate health recommendations around their day-to-day realities (123,124). These findings also reinforced the 2018 Diabetes Canada's Clinical PGs recommendation that suggested combining culturally sensitive diabetes education and support using peer supporters to obtain better knowledge, self-management behaviours, as well as a significant reduction of HbA1c as much as 0.57% (125). Moreover, another point to consider was how peer supporters were ready to support T2D patients as long as training were

adequately provided. Healthcare professionals also regarded peer support intervention as positive in condition of clearly defining role boundaries for peer supporters.

Thirdly, this scoping review also addressed eleven contextual factors to lay the groundwork for a sustainable intervention that would complement existing healthcare efforts in T2D management. To date, although “the role of a peer supporter is usually a voluntary role that is formally recognized, but generally not compensated” (28), this study underscored contextual factors to be put in place akin to various novel service development for successful implementation. Numerous research were available to initiate T2D peer support program development but dwindled when moving on to program implementation and evaluation. Nonetheless, the findings of this scoping review pointed to the importance of considering certain particularities during the recruitment & selection process. For instance, gender-specific preferences and traits of peer supporters, entrance interview selection, and community recruitment venues should be examined. Despite the peer status of peer supporters, providing formal structure for adequate training, supporting, and updating peer supporters within their role should not be overlooked. Moreover, as mentioned by healthcare professionals, the role definition of peer supporters was seen as crucial in designing training curriculum and ensuring an intersectoral collaboration. In fact, this aspect brought healthcare professionals’ concern in working with peer supporters to the fore. In a similar vein, as highlighted by Guardian (2017), the inclusion of peer supporters as colleagues had brought upon many uncertainties for some healthcare professionals such as how to collaborate with their new function colleagues, what are the roles and limits of peer supporters and whether their duties would be put on the line (126). To address such concerns, at least in the domain of mental health, the Québec program *Pairs Aidants Réseau* has been actively aiming to sensitize service providers to optimize the integration of peer supporters as workers (also known as peer support workers) (127).

Finally, compared to usual care, peer support has the potential to address health disparities in facilitating access to diabetes management but care must be taken to facilitate its accessibility. A population survey in Quebec by Fournier & Murphy (2016) revealed that 52% of diabetics consulted 4 or more sources of information. The majority obtained their sources from healthcare

professionals (92%); self-education (83%); and directed information from associations, self-help groups or courses (43%). The authors noted that the latter source of information was used only by a minority of the population due to accessibility issues (128). This reinforces the findings of this scoping review in the need to consider versatile venues for T2D peer support initiatives such as within primary care practices, community-based setting or in a virtual environment.

5.1 Strengths and Limitations of the Study

Overall, this thesis followed rigorously the methodological framework adopted as per Arksey and O'Malley's iterative five-stages framework (50) combined with Levac et al.'s enhancements (51), and reported the findings in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) (52).

Firstly, although efforts were taken to encompass the most comprehensive scope of the literature, the mapping of evidence were inevitably bounded within the research availability in the chosen search time-frame (January 2007 to 2021) for the three review questions. Nonetheless, collaborating with a reference librarian to identify studies from several databases with detailed search strategies helped to reduce study identification bias. The optional consultation exercise as proposed by Arksey and O'Malley's methodological framework (50) could have also been undertaken to optimize this scoping review by allowing additional suggestions of references from experts and stakeholders in the study domain.

Secondly, the included studies were bounded by predefined selection (inclusion/exclusion) criteria. This helped to not only account for the study selection bias but also for the relevant breadth and depth of the findings to be considered applicable for stakeholders who are interested in developing peer support initiatives for T2D population in the context of primary care or community-based setting in high-income nations.

Thirdly, in contrast to a systematic review, this scoping review did not attempt to make any assumptions on the quality of the included studies as no quality appraisal of evidences was conducted, which was consistent with the methods for conducting a scoping review (50,51). As a result, it would not be possible to determine whether a given included study's findings were valid.

However, the findings of some included studies might very well be generalizable given the size and representative nature of the sample.

Lastly, the usage of Heisler's (2006) classification (56) might have been suboptimal given the impression of overlapping between some of the presented T2D peer support modalities. Proposing another way to classify the characteristics of T2D peer support models from the included studies might be one solution. However, it might still not necessarily capture all the possible emerging forms of T2D peer support models that lie at the interface between primary care and community-based settings.

Chapter 6 – Conclusion

In summary, the results of this scoping review advocated T2D peer support initiatives for the betterment of conventional T2D management and overviewed the scope of peer support models that can be hand-picked to complement the existing healthcare efforts. It also enabled the identification of knowledge gaps for certain peer support modalities and contextual factors for sustainable practice.

6.1 Implications of the Findings for Research

More lessons learned from existing peer support program managers are invaluable. Primary studies are needed to study the clinical, self-management behavioural, and psychological impact of peer coaching. More studies are needed in key contextual factors such as recognition, retention and remuneration, in order to avoid high turnovers and to secure peer supporters as an integral player in helping diabetes management. Future research may consider performing a realist review to study the causal mechanisms and to compare what peer support modality works for whom, and under what context thus contributing towards implementation activity. To further ensure intervention quality, evidences on intervention fidelity should go hand in hand with training and supervision research data. Lastly, to entice peer support intervention funding, more studies are needed about costing analysis.

6.2 Implications of the Findings for Practice

In light of the findings of this scoping review, T2D peer support intervention should be considered as a complement to existing DSME programs to alleviate the burden of the primary healthcare system by leveraging community participation and fostering intersectoral collaboration. Among the five peer support models, face-to-face self-management programs and telephone-based peer support seem the most promising with the largest coverage of scientific evidence on T2D outcomes. In fact, face-to-face self-management programs was seen as most pertinent amongst the ethnic minority groups with a collectivist background and is worthy of consideration for reaching out to the hardly reached in a multicultural environment. As in any program implementation, care must be taken in recruiting, training and retaining peer supporters.

Stakeholders interested in peer support intervention for T2D in high-income nations may utilise the results of this scoping review to consider important elements and to further explore site-specific options.

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Appendices

Appendix I : Search Strategy

MEDLINE (Ovid, 1946 to January 29, 2021)

| # | Searches |
|----|--|
| 1 | type 2 diabetes.ab,kw,ti. |
| 2 | limit 1 to (yr="2007 -Current" and "all adult (19 plus years)" and (english or french)) |
| 3 | adult-onset diabetes.ab,kw,ti. |
| 4 | limit 3 to (yr="2007 -Current" and "all adult (19 plus years)" and (english or french)) |
| 5 | noninsulin-dependent diabetes mellitus.ab,kw,ti. |
| 6 | limit 5 to (yr="2007 -Current" and "all adult (19 plus years)" and (english or french)) |
| 7 | *Diabetes Mellitus, Type 2/ |
| 8 | limit 7 to (yr="2007 -Current" and "all adult (19 plus years)" and (english or french)) |
| 9 | peer support*.ab,kw,ti. |
| 10 | limit 9 to (yr="2007 -Current" and "all adult (19 plus years)" and (english or french)) |
| 11 | peer-to-peer support*.ab,kw,ti. |
| 12 | limit 11 to (yr="2007 -Current" and "all adult (19 plus years)" and (english or french)) |
| 13 | peer coach*.ab,kw,ti. |
| 14 | limit 13 to (yr="2007 -Current" and "all adult (19 plus years)" and (english or french)) |
| 15 | peer help*.ab,kw,ti. |
| 16 | limit 15 to (yr="2007 -Current" and "all adult (19 plus years)" and (english or french)) |
| 17 | peer relation*.ab,kw,ti. |

| | |
|----|--|
| 18 | limit 17 to (yr="2007 -Current" and "all adult (19 plus years)" and (english or french)) |
| 19 | peer facilitator*.ab,kw,ti. |
| 20 | limit 19 to (yr="2007 -Current" and "all adult (19 plus years)" and (english or french)) |
| 21 | lay-assistant*.ab,kw,ti. |
| 22 | limit 21 to (yr="2007 -Current" and "all adult (19 plus years)" and (english or french)) |
| 23 | Social Support/ |
| 24 | limit 23 to (yr="2007 -Current" and "all adult (19 plus years)" and (english or french)) |
| 25 | peer group/ |
| 26 | limit 25 to (yr="2007 -Current" and "all adult (19 plus years)" and (english or french)) |
| 27 | Primary Health Care/ or General Practice/ or Family Practice/ or Physicians, Family/ or General Practitioners/ or Physicians, Primary Care/ or Group practice/ or Ambulatory Care/ or Community Health Services/ or Community Health Centers/ or Community Mental Health Services/ or Community Mental Health Centers/ |
| 28 | limit 27 to (yr="2007 -Current" and "all adult (19 plus years)" and (english or french)) |
| 29 | ((primary adj3 care) or ("primary healthcare" or "primary health" or "first line") or ((family or general or group) adj2 (doctor or doctors or physician* or practice* or practitioner* or medicine)) or (rural adj3 (physician* or practice or practitioner*)) or generalist* or (ambulatory adj2 (care or clinic)) or (health adj3 (center* or centre*)) or consult* or (visit* adj3 (clinic* or care or outpatient)) or (community adj3 (care or worker* or service*))).ab,kw,ti. |
| 30 | limit 29 to (yr="2007 -Current" and "all adult (19 plus years)" and (english or french)) |
| 31 | 2 or 4 or 6 or 8 |
| 32 | 10 or 12 or 14 or 16 or 18 or 20 or 22 or 24 or 26 |
| 33 | 31 and 32 |
| 34 | (202007* or 202008* or 202009* or 202010* or 202011* or 202012* or "202101").dt,ez,da. |

| | |
|----|-----------|
| 35 | 28 or 30 |
| 36 | 33 and 35 |
| 37 | 33 and 34 |
| 38 | 34 and 36 |

Embase (Ovid, 1974 to January 29, 2021)

| # | Searches |
|----|--|
| 1 | "type 2 diabetes".ab,kw,ti. |
| 2 | limit 1 to (embase and (english or french) and yr="2007 -Current" and (adult <18 to 64 years> or aged <65+ years>)) |
| 3 | "adult-onset diabetes".ab,kw,ti. |
| 4 | limit 3 to (embase and (english or french) and yr="2007 -Current" and (adult <18 to 64 years> or aged <65+ years>)) |
| 5 | "Diabetes Mellitus, Type 2".ab,kw,ti. |
| 6 | limit 5 to (embase and (english or french) and yr="2007 -Current" and (adult <18 to 64 years> or aged <65+ years>)) |
| 7 | non insulin dependent diabetes mellitus/ |
| 8 | limit 7 to (embase and (english or french) and yr="2007 -Current" and (adult <18 to 64 years> or aged <65+ years>)) |
| 9 | "peer support*".ab,kw,ti. |
| 10 | limit 9 to (embase and (english or french) and yr="2007 -Current" and (adult <18 to 64 years> or aged <65+ years>)) |
| 11 | peer group/ or social support/ |
| 12 | limit 11 to (embase and (english or french) and yr="2007 -Current" and (adult <18 to 64 years> or aged <65+ years>)) |

| | |
|----|---|
| 13 | "peer-to-peer support*".ab,kw,ti. |
| 14 | limit 13 to (embase and (english or french) and yr="2007 -Current" and (adult <18 to 64 years> or aged <65+ years>)) |
| 15 | "peer coach*".ab,kw,ti. |
| 16 | limit 15 to (embase and (english or french) and yr="2007 -Current" and (adult <18 to 64 years> or aged <65+ years>)) |
| 17 | "peer help*".ab,kw,ti. |
| 18 | limit 17 to (embase and (english or french) and yr="2007 -Current" and (adult <18 to 64 years> or aged <65+ years>)) |
| 19 | "peer relation**".ab,kw,ti. |
| 20 | limit 19 to (embase and (english or french) and yr="2007 -Current" and (adult <18 to 64 years> or aged <65+ years>)) |
| 21 | "peer facilitator*".ab,kw,ti. |
| 22 | limit 21 to (embase and (english or french) and yr="2007 -Current" and (adult <18 to 64 years> or aged <65+ years>)) |
| 23 | "lay-assistant*".ab,kw,ti. |
| 24 | limit 23 to (embase and (english or french) and yr="2007 -Current" and (adult <18 to 64 years> or aged <65+ years>)) |
| 25 | primary health care/ or general practice/ or general practitioner/ or group practice/ or ambulatory care/ or community care/ or health center/ or community mental health service/ or community mental health center/ |
| 26 | limit 25 to (embase and (english or french) and yr="2007 -Current" and (adult <18 to 64 years> or aged <65+ years>)) |
| 27 | ((primary adj3 care) or ("primary healthcare" or "primary health" or "first line") or ((family or general or group) adj2 (doctor or doctors or physician* or practice* or practitioner* or medicine)) or (rural adj3 (physician* or practice or practitioner*)) or generalist* or (ambulatory adj2 (care or clinic)) or (health adj3 (center* or centre*)) or consult* or (visit* |

| | |
|----|--|
| | adj3 (clinic* or care or outpatient)) or (community adj3 (care or worker* or service*))).ab,kw,ti. |
| 28 | limit 27 to (embase and (english or french) and yr="2007 -Current" and (adult <18 to 64 years> or aged <65+ years>)) |
| 29 | 2 or 4 or 6 or 8 |
| 30 | 10 or 12 or 14 or 16 or 18 or 20 or 22 or 24 |
| 31 | 29 and 30 |
| 32 | limit 31 to dc=20210101-20210201 |
| 33 | 26 or 28 |
| 34 | 31 and 33 |
| 35 | limit 34 to dc=20210101-20210201 |

CINAHL Plus with Full Text (EBSCO, inception to February 1, 2021)

| # | Query |
|-----|--|
| S14 | S11 AND S12 |
| S13 | S10 AND S12 |
| S12 | EM 20210101-20210201 |
| S11 | S9 AND S10 |
| S10 | S7 AND S8 |
| S9 | S5 OR S6 |
| S8 | S3 OR S4 |
| S7 | S1 OR S2 |
| S6 | (MH "Family Practice") OR (MH "Physicians") OR (MH "Physicians, Family") OR (MH "Group Practice") OR (MH "Ambulator□ Care") OR (MH "Community Health Services") OR (MH "Community Health Centers") OR (MH "Primary Health Care") |
| S5 | TI ((primary adj3 care) or ("primary healthcare" or "primary health" or "first line") or (family or general or group) adj2 (doctor or doctors or physician* or practice* or |

| | |
|----|--|
| | practitioner* or medicine)) or (rural adj3 (physician* or practice or practitioner*)) or generalist* or (ambulatory adj2 (care or clinic)) or (health adj3 (center* or centre*)) or consult* or (visit* adj3 (clinic* or care or outpatient)) or (community adj3 (care or worker* or service*))) OR AB ((primary adj3 care) or ("primary healthcare" or "primary health" or "first line") or ((family or general or group) adj2 (doctor or doctors or physician* or practice* or practitioner* or medicine)) or (rural adj3 (physician* or practice or practitioner*)) or generalist* or (ambulatory adj2 (care or clinic)) or (health adj3 (center* or centre*)) or consult* or (visit* adj3 (clinic* or care or outpatient)) or (community adj3 (care or worker* or service*))) OR SU ((primary adj3 care) or ("primary healthcare" or "primary health" or "first line") or ((family or general or group) adj2 (doctor or doctors or physician* or practice* or practitioner* or medicine)) or (rural adj3 (physician* or practice or practitioner*)) or generalist* or (ambulatory adj2 (care or clinic)) or (health adj3 (center* or centre*)) or consult* or (visit* adj3 (clinic* or care or outpatient)) or (community adj3 (care or worker* or service*))) |
| S4 | (MH "Peer Counseling") OR (MH "Peer Group") |
| S3 | TI ("peer coach*" OR "peer facilitator*" OR "peer relation*" OR "peer help*" OR "peer-to-peer support*" OR "social support" OR "peer support*" OR "lay- assistant") OR AB ("peer coach*" OR "peer facilitator*" OR "peer relation*" OR "peer help*" OR "peer-to-peer support*" OR "social support" OR "peer support*" OR "lay- assistant") OR SU ("peer coach*" OR "peer facilitator*" OR "peer relation*" OR "peer help*" OR "peer-to-peer support*" OR "social support" OR "peer support*" OR "lay- assistant") |
| S2 | (MH "Diabetes Mellitus, Type 2") |
| S1 | TI ("type 2 diabetes" OR "adult-onset diabetes" OR "noninsulin-dependent diabetes mellitus") OR AB ("type 2 diabetes" OR "adult-onset diabetes" OR "noninsulin-dependent diabetes mellitus") OR SU ("type 2 diabetes" OR "adult-onset diabetes" OR "noninsulin-dependent diabetes mellitus") |

Web of Science Core Collection (Clarivate, 1945 to February 2, 2021)

| # | Query |
|---|-----------|
| 7 | #6 AND #5 |

| | |
|---|---|
| 6 | # 2 AND #1 |
| 5 | # 4 OR # 3 |
| 4 | TOPIC: (("Primary Health Care" or "General Practice" or "Family Practice" or "Physicians, Family" or "General Practitioners" or "Physicians, Primary Care" or "Group practice" or "Ambulatory Care" or "Community Health Services" or "Community Health Centers" or "Community Mental Health Services" or "Community Mental Health Centers")) |
| 3 | TOPIC: (("primary near/3 care" or "primary healthcare" or "primary health" or "first line" or "family or general or group near/2 doctor or doctors or physician* or practice* or practitioner* or medicine" or "rural near/3 physician* or practice or practitioner*" or "generalist*" or "ambulatory near/2 care or clinic" or "health near/3 center* or centre*" or "consult*" or "visit* near/3 clinic* or care or outpatient" or "community near/3 care or worker* or service*")) |
| 2 | TOPIC: ("peer support*") OR TOPIC: ("peer-to-peer support*") OR TOPIC: ("peer coach*") OR TOPIC: ("peer help*") OR TOPIC: ("peer relation*") OR TOPIC: ("peer facilitator*") OR TOPIC: ("lay-assistant") OR TOPIC: ("social support") OR TOPIC: ("peer group") |
| 1 | TOPIC: ("type 2 diabetes") OR TOPIC: ("adult-onset diabetes") OR TOPIC: ("noninsulin-dependent diabetes mellitus") OR TOPIC: ("Diabetes Mellitus, Type 2") |

Appendix II : Summary Table of Included Studies

| Studies (year) [references] | Country | Study design | Peer support model(s) | T2D study outcomes associated with peer support model(s): | Type of stakeholder perspectives | Contextual factors |
|---|-----------|----------------------|---|--|--|---|
| World Health Organization (2007) (129) | Multiple | Expert opinion | Face-to-face self-management programs Peer coaching Telephone-based peer support Online-based peer support | HbA1c Blood pressure BMI/weight Self-efficacy Diabetes knowledge Physical activity (Face-to-face self-management programs) Physical activity (Telephone-based peer support) | none | Role definition Training Recognition Supervision |
| Pérez- Escamilla et al. (2008) (86) | USA | Systematic review | Community health workers Telephone-based peer support | HbA1c Blood pressure Cholesterol BMI/weight Self-efficacy Diabetes knowledge Healthy eating Physical activity Perceived social support | none | Recruitment & Selection Training |
| Funnell (2009) (130) | Multiple | Literature review | Face-to-face self-management programs Peer coaching Online-based peer support | none | none | Training Recognition Supervision |
| Savage et al. (2009) (101) | Australia | Qualitative study | Face-to-face self-management programs | none | T2D patients | none |

| Studies (year) [references] | Country | Study design | Peer support model(s) | T2D study outcomes associated with peer support model(s): | Type of stakeholder perspectives | Contextual factors |
|---------------------------------|-------------|------------------------|---|---|----------------------------------|---|
| Simmons et al. (2010) (108) | New Zealand | Literature review | Face-to-face self-management programs Peer coaching | none | Healthcare professionals | Role definition |
| Clark (2010) (131) | Multiple | Expert opinion | Face-to-face self-management programs | none | none | Recruitment & Selection Role definition |
| Caro & Fisher (2010) (54) | Multiple | Expert opinion | Unspecified | none | none | Role definition |
| Baksi (2010) (132) | UK | Expert opinion | Face-to-face self-management programs Peer coaching | none | none | Recruitment & Selection Role definition Training Supervision |
| Boothroyd & Fisher (2010) (2) | Multiple | Expert opinion | General discussion | none | none | Role definition |
| Irvine et al. (2011) (133) | UK | Economic evaluation | Face-to-face self-management programs Telephone-based peer support | none | none | Training Costing analysis |
| Bahun & Savic (2011) (96) | Slovenia | Survey research design | Unspecified | outcomes reported but no association with a particular peer support model | T2D patients | Role definition Training |
| Hunt et al. (2011) (134) | USA | Integrative review | Community health workers | HbA1c | none | Role definition Training |
| Gillespie & O'Shea (2012) (135) | Ireland | Economic evaluation | Face-to-face self-management programs | none | none | Costing analysis |

| Studies (year) [references] | Country | Study design | Peer support model(s) | T2D study outcomes associated with peer support model(s): | Type of stakeholder perspectives | Contextual factors |
|-----------------------------|---|-------------------|--|---|----------------------------------|---|
| Dale et al. (2012) (3) | USA (17) UK (4) Ireland (1) Australia (1) Netherlands (1) Canada (1) | Systematic review | Face-to-face self-management programs Telephone-based peer support Online-based peer support | HbA1c, Cholesterol, Healthy eating Physical activity, Diabetes distress, Perceived social support (Face-to-face self-management programs, Telephone-based peer support, Web- based peer support) Blood pressure, BMI/weight Self-efficacy, (Face-to-face self-management programs, Telephone-based peer support) | none | Recruitment & Selection Training Supervision Retention Venue Intervention fidelity |
| Murray et al. (2012) (136) | UK | Feasibility study | Telephone-based peer support | none | none | Recruitment & Selection Training Recognition Retention Costing analysis |
| Hunt & Grant (2012) (137) | USA | Expert opinion | Community health workers | none | none | Role definition Training Supervision |

| Studies (year) [references] | Country | Study design | Peer support model(s) | T2D study outcomes associated with peer support model(s): | Type of stakeholder perspectives | Contextual factors |
|----------------------------------|---------|-------------------|---|---|---|---|
| Haltiwanger (2012) (69) | USA | Pre-post design | Face-to-face self-management programs | HbA1c Self-efficacy | none | Training Supervision Reach Intervention fidelity |
| Haltiwanger & Brutus (2012) (70) | USA | Mixed methods | Face-to-face self-management programs | HbA1c Self-efficacy | none | Supervision Venue |
| Scarpello et al. (2013) (103) | UK | Qualitative study | Telephone-based peer support | none | Peer supporters Healthcare professionals | Role definition Training Supervision Retention |
| Paul et al. (2013) (82) | Ireland | Qualitative study | Face-to-face self-management programs | Diabetes distress | T2D patients Peer supporters Healthcare professionals | Role definition Training Supervision Retention Venue Reach |
| Goldman et al. (2013) (105) | USA | Qualitative study | Peer coaching Telephone-based peer support | none | Peer supporters | Recruitment & Selection Role definition Training Remuneration Supervision |
| Whitford et al. (2013) (78) | Ireland | Qualitative study | Face-to-face self-management programs | Perceived social support | T2D patients | Reach |
| Tang et al. (2013) | Canada | Cohort studies | Face-to-face self-management programs | none | Peer supporters | Role definition Training |

| Studies (year) [references] | Country | Study design | Peer support model(s) | T2D study outcomes associated with peer support model(s): | Type of stakeholder perspectives | Contextual factors |
|------------------------------|-------------|---|---|---|---|---|
| (106) | | | | | | Recognition |
| Piette et al. (2013) (64) | USA | RCT | Face-to-face self-management programs Telephone-based peer support | HbA1c | none | Reach |
| Carey et al. (2014) (84) | UK | Non-randomized controlled equivalence trial | Face-to-face self-management programs | HbA1c Blood pressure Cholesterol BMI/Weight | | Recruitment & Selection Training Costing analysis |
| Mandalia et al. (2014) (102) | UK | Qualitative study | Face-to-face self-management programs | none | T2D patients Peer supporters Healthcare professionals | Recruitment & Selection Training Recognition Supervision |
| Rogers et al. (2014) (90) | USA | Cohort studies | Peer coaching | HbA1c | none | Recruitment & Selection Training |
| Whittle (2014) (138) | USA | Expert opinion | Face-to-face self-management programs Telephone-based peer support | none | none | Remuneration |
| De Vries et al. (2014) (139) | Netherlands | Study protocol | Face-to-face self-management programs | Diabetes distress (unpublished results) | none | none |
| Lynch et al. (2014) (73) | USA | RCT | Face-to-face self-management programs Telephone-based peer support | HbA1c BMI/weight | none | Training |

| Studies (year) [references] | Country | Study design | Peer support model(s) | T2D study outcomes associated with peer support model(s): | Type of stakeholder perspectives | Contextual factors |
|-----------------------------------|-------------------------|-------------------|--|---|----------------------------------|---|
| Tang et al. (2014) (83) | Canada | Pre-post design | Face-to-face self-management programs | HbA1c Diabetes distress | T2D patients | Training Venue Reach |
| Knox et al. (2015) (71) | USA | Mixed methods | Face-to-face self-management programs | HbA1c Diabetes knowledge Healthy eating Perceived social support | T2D patients | Intervention fidelity |
| Yin et al. (2015) (87) | Hong Kong | Pre-post design | Telephone-based peer support | HbA1c | none | Training |
| Qi et al. (2015) (91) | USA (11) Ireland (1) | Meta-analysis | Face-to-face self-management programs Telephone-based peer support Peer coaching Community health workers | HbA1c (Peer coaching, Community health workers) | none | none |
| Richardson et al. (2015) (99) | USA | Qualitative study | Community health workers | none | T2D patients | Recruitment & Selection Role definition Venue |
| Vorderstrasse et al. (2015) (140) | USA | Study protocol | Online-based peer support Text-based peer support | HbA1c Blood pressure Cholesterol BMI/weight Diabetes knowledge Self-efficacy Physical activity Healthy eating Diabetes distress Perceived social support | none | Intervention fidelity |

| Studies (year) [references] | Country | Study design | Peer support model(s) | T2D study outcomes associated with peer support model(s): | Type of stakeholder perspectives | Contextual factors |
|---------------------------------|--|---------------------|--|---|----------------------------------|------------------------------|
| | | | | (unpublished results) | | |
| Cherrington et al. (2015) (107) | USA | Pilot study | Community health workers Online-based peer support | none | Peer supporters | Training |
| Johansson et al. (2016) (110) | Austria | Economic evaluation | Face-to-face self-management programs | none | none | Training Costing analysis |
| Alzubaidi et al. (2016) (95) | Australia | Qualitative study | Face-to-face self-management programs | none | T2D patients | Recruitment & Selection |
| Zhang et al. (2016) (66) | USA (13) Texas-Mexico Border (1) UK (2) Ireland (1) China HK (1) | Meta-analysis | Face-to-face self-management programs Telephone-based peer support Peer coaching Community health workers | HbA1c | none | none |
| Lewinski & Fisher (2016) (100) | Multiple | Integrative review | Online-based peer support | none | T2D patients | Reach |
| Davis et al. (2016) (75) | USA | Pre-post design | Face-to-face self-management programs | Diabetes knowledge | Peer supporters | Training Reach |

| Studies (year) [references] | Country | Study design | Peer support model(s) | T2D study outcomes associated with peer support model(s): | Type of stakeholder perspectives | Contextual factors |
|------------------------------|------------------------------------|---------------------|--|--|----------------------------------|----------------------------------|
| Ruddock et al. (2016) (141) | Multiple | Literature review | Face-to-face self-management programs Telephone-based peer support Community health workers Online-based peer support | HbA1c (Face-to-face self-management programs, Telephone-based peer support, Online-based peer support) | none | Reach Costing analysis |
| Boudreau et al. (2016) (142) | Canada | Study protocol | Online-based peer support | Physical activity (unpublished result) | none | none |
| Kowitt et al. (2017) (72) | USA | Pre-post design | Face-to-face self-management programs Peer coaching | HbA1c Diabetes distress | none | Training |
| Wingate et al. (2017) (111) | UK | Economic evaluation | Face-to-face self-management programs Peer coaching Telephone-based peer support | none | none | Costing analysis |
| Okoro et al. (2017) (109) | USA | Qualitative study | Peer coaching | none | Program managers | Recruitment & Selection |
| Gatlin et al. (2017) (63) | UK (3) USA (2) Australia (1) | Systematic review | Face-to-face self-management programs Telephone-based peer support Text-based peer support | HbA1c, Diabetes knowledge (Face-to-face self-management programs, Telephone-based peer support) Healthy eating, Perceived social support | T2D patients | Training Supervision Reach |

| Studies (year) [references] | Country | Study design | Peer support model(s) | T2D study outcomes associated with peer support model(s): | Type of stakeholder perspectives | Contextual factors |
|-----------------------------------|---------------------------------|-----------------------------------|---|---|----------------------------------|--------------------|
| | | | | (Face-to-face self-management programs) | | |
| Odgers-Jewell et al. (2017) (74) | USA (18) UK (6) Italy (5) | Systematic review & Meta-analysis | Face-to-face self-management programs | HbA1c Blood pressure Cholesterol BMI/weight Diabetes knowledge Self-efficacy | none | Training Venue |
| Mitchell-Brown et al. (2017) (97) | USA | Qualitative study | Face-to-face self-management programs | none | T2D patients | Training Reach |
| Okoro et al. (2018) (79) | USA | Qualitative study | Face-to-face self-management programs Telephone-based peer support | Perceived social support | T2D patients | Reach |
| Hood et al. (2018) (81) | USA | Mixed methods | Face-to-face self-management programs | Diabetes distress | T2D patients | Venue |
| Yeung et al. (2018) (89) | Hong Kong | RCT | Telephone-based peer support | Diabetes distress | none | none |
| Yu et al. (2018) (85) | UK | Cohort studies | Face-to-face self-management programs Peer coaching | none | none | Costing analysis |
| Sani et al. (2018) (65) | Saudi Arabia | Pre-post design | Face-to-face self-management programs Text-based peer support | HbA1c Blood pressure Cholesterol | none | none |

| Studies (year) [references] | Country | Study design | Peer support model(s) | T2D study outcomes associated with peer support model(s): | Type of stakeholder perspectives | Contextual factors |
|-----------------------------|-----------|--------------------|---|---|---|---|
| | | | | BMI/weight Physical activity Diabetes knowledge (Face-to-face self-management programs) BMI/weight (Text-based peer support) | | |
| Aziz et al. (2018) (77) | Australia | Process evaluation | Face-to-face self-management programs | Physical activity Healthy eating | T2D patients Peer supporters | Recruitment & Selection Training Supervision Reach Intervention fidelity |
| Garner et al. (2019) (143) | UK | Feasibility study | Face-to-face self-management programs Telephone-based peer support | none | none | Recruitment & Selection Training Retention |
| McGowan et al. (2019) (88) | Canada | Pre-post design | Telephone-based peer support | HbA1c Self-efficacy | none | Recruitment & Selection Training |
| Holman et al. (2019) (104) | UK | Qualitative study | Face-to-face self-management programs Telephone-based peer support | none | Peer supporters Healthcare professionals | Recruitment & Selection Training Venue |

| Studies (year) [references] | Country | Study design | Peer support model(s) | T2D study outcomes associated with peer support model(s): | Type of stakeholder perspectives | Contextual factors |
|-------------------------------|---|-----------------------------------|--|--|----------------------------------|--|
| | | | | | | Retention |
| Kong et al. (2019) (4) | Austria (1) Australia (1) Ireland (1) Netherlands (1) UK (4) USA (3) | Systematic review & Meta-analysis | Face-to-face self-management programs Telephone-based peer support Online-based peer support | Self-efficacy | none | none |
| Carpenter et al. (2019) (144) | USA (7) Netherlands (1) Australia (1) | Integrative review | Face-to-face self-management programs Community health workers | HbA1c | none | none |
| Heisler et al. (2019) (92) | USA | RCT | Peer coaching Online-based peer support | HbA1c Blood pressure Perceived social support | none | Training Intervention fidelity |
| Kong et al. (2020) (80) | Canada (1) Netherlands (1) UK (2) USA (5) | Systematic review & Meta-analysis | Face-to-face self-management programs Telephone-based peer support | Diabetes distress | none | Recruitment & Selection Training Supervision |
| Afshar et al. (2020) (67) | Multiple | Systematic review | Face-to-face self-management programs Telephone-based peer support Online-based peer support | HbA1c Blood pressure Cholesterol BMI/Weight Diabetes knowledge | none | Recruitment & Selection Training Retention |

| Studies (year) [references] | Country | Study design | Peer support model(s) | T2D study outcomes associated with peer support model(s): | Type of stakeholder perspectives | Contextual factors |
|-----------------------------------|---------|------------------------|--|--|----------------------------------|-------------------------|
| | | | | Self-efficacy Physical activity Healthy eating Diabetes distress (Face-to-face self-management programs Telephone-based peer support Online-based peer support) Perceived social support (Face-to-face self-management programs, Telephone-based peer support) | | Intervention fidelity |
| Okoro (2020) (98) | USA | Qualitative study | Face-to-face self-management programs Telephone-based peer support Peer coaching | none | T2D patients | Training Supervision |
| Presley et al. (2020) (94) | USA | RCT | Online-based peer support Community health workers | HbA1c Self-efficacy Diabetes distress | none | Intervention fidelity |
| Herrero et al. (2020) (145) | Spain | Survey research design | Online-based peer support | Physical activity Healthy eating | none | none |

| Studies (year) [references] | Country | Study design | Peer support model(s) | T2D study outcomes associated with peer support model(s): | Type of stakeholder perspectives | Contextual factors |
|-----------------------------|---|-------------------|---|--|----------------------------------|--------------------|
| Litchman et al. (2020) (68) | Multiple | Systematic review | Face-to-face self-management programs Peer coaching Community health workers Telephone-based peer support Online-based peer support | HbA1c Blood pressure Cholesterol BMI/Weight Diabetes knowledge Self-efficacy Physical activity Healthy eating Perceived social support (Face-to-face self-management programs, Telephone-based peer support, Online-based peer support) Diabetes distress (Face-to-face self-management programs, Telephone-based peer support) | none | Reach |
| Liang et al. (2020) (76) | USA (4) Ireland (1) Netherlands (1) | Meta-analysis | Face-to-face self-management programs Telephone-based peer support | Diabetes distress Self-efficacy | none | none |
| Yu et al. (2021) (93) | UK | Cohort studies | Face-to-face self-management programs Peer coaching | Blood pressure | none | Costing analysis |