Review

Culturally Tailored Self-Management Interventions for South Asians With Type 2 Diabetes: A Systematic Review

Nevin Navodia RN, MN [a]; Olive Wahoush PhD, RN [b]; Tricia Tang PhD [c];
Jennifer Yost PhD, RN [d]; Sarah Ibrahim PhD, RN, MN [e]; Diana Sherifali PhD, RN, CDE [b,f,]*

[a] Diabetes Complications & Preventions Program, St. Joseph's Healthcare, Hamilton, Ontario, Canada
[b] School of Nursing, McMaster University, Hamilton, Ontario, Canada
[c] Division of Endocrinology, Department of Medicine, University of British Columbia, Vancouver, British Columbia, Canada
[d] M. Louise Fitzpatrick College of Nursing, Villanova University, Villanova, Pennsylvania, United States of America
[e] Lawrence S. Bloomberg Faculty of Nursing, University of Toronto
[f] Diabetes Care and Research Program, Hamilton Health Sciences, Hamilton, Ontario, Canada

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Key Messages

- Importance of designing preferred behavioural interventions that meet the needs of and are culturally congruent with the target population.
- Importance of understanding the heterogeneity of different cultural groups when designing behavioural interventions.

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ABSTRACT

Diabetes mellitus is one of the most common chronic diseases worldwide and a leading cause of morbidity and mortality. A high prevalence of type 2 diabetes mellitus has been noted among the South Asian population, in general, and migrant South Asians. Self-management is considered a proponent to the management of diabetes. Although empirical evidence supports such interventions, little is known regarding the cultural congruency of such interventions for diverse cultural and ethnic groups, particularly South Asians. Our purpose was to determine the effectiveness of diabetes self-management education (DSME) and diabetes self-management support (DSMS), interventions on migrant South Asian's glycated hemoglobin (A1C) levels and whether DSME and DSMS interventions are culturally tailored to the migrant South Asian population. In this study, a systematic review, with narrative synthesis, was conducted. Data were extracted on the study, participant, and intervention characteristics and the cultural congruity using Leininger's sunrise model. Four studies meeting the inclusion criteria were included. Overall, most (75%) of the DSME and DSMS interventions were not effective in reducing A1C levels. Specific to cultural congruity of the interventions, all studies delivered the intervention based on the participant's preferred language and incorporated culturally sensitive dietary information primarily by persons of the same cultural and ethnic background. However, little information was presented on the provision and integration of culturally congruent care. Findings highlight the importance of rethinking the way in which South Asians are labelled as a homogenous group and accounting for such differences when adapting and designing culturally tailored DSME and or DSMS interventions in clinical practice.

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RÉSUMÉ

Le diabète sucré est l'une des maladies chroniques les plus fréquentes dans le monde et la principale cause de morbidité et de mortalité. On remarque une forte prévalence du diabète sucré de type 2 dans la population sud-asiatique, en général, et immigrante d'origine sud-asiatique. On considère que la prise en charge autonome préconise la prise en charge du diabète. Bien que des données empiriques soutiennent ces interventions, on n'en connaît peu sur la congruence culturelle de ces interventions auprès des divers

groupes culturels et ethniques, particulièrement les Asiatiques du Sud. Notre objectif était de déterminer l'efficacité de l'enseignement sur la prise en charge autonome du diabète (DSME, de l'anglais *diabetes self-management education*) et du soutien à la prise en charge autonome du diabète (DSMS, de l'anglais *diabetes self-management support*), les interventions sur les concentrations de l'hémoglobine glyquée (A1c) des immigrants sud-asiatiques et si les interventions de DSME et de DSMS sont culturellement adaptées à la population d'immigrants sud-asiatiques. Dans la présente étude, nous avons réalisé une revue systématique et une synthèse narrative. Nous avons extrait les données sur les caractéristiques de l'étude, des participants et des interventions, et sur la congruence culturelle en utilisant le modèle Sunrise de Leininger. Nous avons sélectionné 4 études qui répondaient aux critères d'inclusion. Dans l'ensemble, la plupart (75 %) des interventions de DSME et de DSMS se sont révélées non efficaces pour réduire les concentrations d'A1c. Pour ce qui est de la congruence culturelle des interventions, toutes les études montraient que les interventions étaient offertes dans la langue de préférence des participants et comptaient des renseignements sur les pratiques alimentaires culturellement adaptées qui provenaient surtout de personnes ayant les mêmes antécédents culturels et ethniques. Toutefois, ces études ont fourni peu de renseignements sur la prestation et l'intégration de soins culturellement congruents. Les résultats montrent qu'il est crucial de reconsidérer la manière avec laquelle les Asiatiques du Sud sont étiquetés comme étant un groupe homogène et de tenir compte de ces différences lors de l'adaptation et de la conception des interventions de DSME ou de DSMS culturellement adaptées dans la pratique clinique.

Introduction

Diabetes mellitus, one of the most common chronic diseases worldwide and a leading cause of morbidity and mortality, is characterized by inherited and/or acquired deficiency in the production of insulin (1). Type 2 diabetes mellitus (T2DM) is characterized by varying degrees of insulin resistance, decreased insulin secretion and/or impaired insulin action, leading to the inability of the body to effectively respond to insulin produced by the pancreas and resulting in hyperglycemia (2). T2DM accounts for approximately 90% to 95% of all worldwide diabetes diagnoses (3), with estimates that 6.4% (285 million) of the world's adult population is currently living with T2DM and projections of 553 million by 2030 (4). Similar findings have been found in Canada, with 6.8% of the Canadian population living with T2DM (5,6). Diabetes is said to have cost the Canadian health-care system and economy >$11.7 billion in 2010 with projections of $16 billion by 2020 (7). Treatment goals of T2DM are to achieve optimal glycemic targets, reduce the development of adverse events, and prevent the development of short- and long-term complications (8—11).

South Asians (persons from India, Pakistan, Bangladesh, Nepal, Sri Lanka, Bhutan or the Maldives) have been found to have a particularly high risk for developing T2DM (12), with projections of 120.9 million persons in South Asia having diabetes by 2030 (13). The high prevalence of T2DM has also been noted among the South Asian migrant population (14,15), which in Canada comprises 25% of the visible minority population. Although the overall prevalence of T2DM in South Asians is high, there is much heterogeneity across this population, specifically related to ethnic diversity, geography, religion, language, beliefs and health practices.

Self-management is considered a proponent to the management of diabetes. Self-management in the context of diabetes is broadly categorized under diabetes self-management education (DSME) and diabetes self-management support (DSMS). DSME is delivered by members of an interdisciplinary team, with the objective to support informed decision-making, self-care behaviours, problem-solving, active patient participation and collaboration with the health-care team (16,17), whereas DSMS is defined as the activities that help implement and sustain self-management behaviours on an ongoing basis among persons living with diabetes (16). It is often difficult to distinguish DSME and DSMS interventions because of the extensive overlap between them; however, both DSME and DSMS interventions collectively have yielded clinically important and statistically significant outcomes (i.e. improvements in glycated hemoglobin [A1C] levels, reduced risk of diabetes-related complications, reduced number of hospitalizations) (17) for the general population and persons from diverse cultural and ethnic groups.

Although empirical evidence supports such interventions for the management of diabetes, little is known regarding the cultural congruency of such interventions for persons of diverse cultural and ethnic groups, particularly South Asians. Such an exploration is imperative because cultural beliefs have the potential to affect evidence-based interventions (18), such as DSME and/or DSMS, because of the difference in beliefs underpinning evidence-based interventions (19). Cultural beliefs also have the potential to influence persons' perception of health problems and engagement in behavioural change, management, adherence and treatment uptake (18). As a result, the purpose of this systematic review was to begin to address the current gap in the literature and evaluate the cultural congruency of DSMS and/or DSME interventions for migrant South Asian persons using Leininger's sunrise model (20). Leininger's sunrise model presents a guide for health-care providers to assess the cultural and social dimensions that shape health, illness, care and well-being of persons belonging to a given culture (20). More specifically, the objectives of the systematic review were to determine 1) the effectiveness of DSME and DSMS interventions on migrant South Asian's A1C levels, and 2) whether DSME and DSMS interventions are culturally tailored to the migrant South Asian population living in the West.

Methods

Selection criteria

Studies were included in this systematic review if they 1) targeted migrant South Asians (of Indian, Pakistani, Sri Lankan and Bangladeshi descent) (21) living in Western or European countries; 2) included participants ≥18 years of age with T2DM; 3) included either DSME and/or DSMS interventions for the management of diabetes delivered by a health-care provider; 4) assessed and reported on the effectiveness of the intervention, specifically on A1C levels (through continuous variables); 5) included a comparison arm receiving standard care; 6) were randomized controlled trial (RCT) design and 7) were published in English. Studies were excluded if 1) the migrant South Asian participants were residing in

their respective native country of origin; 2) participants had pre-diabetes, had type 1 diabetes and/or gestational diabetes; 3) participants were <18 years of age; 4) studies were qualitative studies, commentaries, editorials or grey literature (including reports, dissertations or theses, conference proceedings and government reports) and 5) they were not published in English.

Search strategies and screening

A literature search was conducted to identify the studies of DSME and/or DSMS interventions using the selection criteria previously identified. Four electronic databases were used to conduct the search, including MEDLINE/PubMed (National Library of Medicine), Embase, Cochrane Controlled Register of Trials and CINAHL. The following key words were used in conjunction with Boolean operators to refine the literature search: patient education OR self-care OR self-management OR self-efficacy OR motivational interviewing OR health coaching OR solution focused therapy OR social support OR health education OR blood glucose self-monitoring OR empowerment OR family involvement AND adolescent OR teenager OR youth OR adult AND South Asian OR India OR Pakistan OR Bengali OR Nepal OR Nepalese OR Sri Lanka OR Asian Canadian OR migrant South Asian AND type 2 diabetes. A supplemental search was conducted by hand of the reference lists from the studies included. The screening of the studies was conducted using the Cochrane handbook as a guide and included 2 independent reviewers.

Data extraction

Data from the studies that met the inclusion criteria were extracted by one reviewer (N.N.) and reviewed by a second reviewer (D.S.) to ensure rigour. Any discrepancies that occurred within the data extraction process were resolved via discussion and consensus between the reviewers (21,22). To address the first question, the following study characteristics were extracted: year of publication, study design, duration of study, study setting, type of diabetes intervention, age of participants and years living with T2DM, sample size and estimate of the treatment effect (p values, confidence intervals, means, SDs and overall findings and results). For the studies with missing data, specifically pertaining to A1C as an outcome, the researchers or authors of the included studies were contacted to request the missing information. If the missing information remained unavailable after contacting the study authors, the study was excluded from the review. To address the second question and guided by Leininger's sunrise model to determine cultural congruency of the interventions within the studies, data specific to the interventions was extracted, including technologic factors; religious and philosophical factors; kinship and social factors; cultural values, beliefs and lifeways; political and legal factors; economic factors and educational factors (23).

Risk of bias assessment

A risk of bias assessment was conducted to determine the methodologic quality of the studies included in this review. The risk of bias assessment was conducted using the standardized Cochrane Risk of Bias tool (21). Data were collected for the following categories to assess risk of bias (i.e. contamination, cointerventions, confounding variables) within the included studies: sequence generation; allocation concealment; blinding of participants, personnel and outcome assessors; incomplete outcome data and selective outcome reporting that may have been present (21).

Data synthesis and analysis

Narrative synthesis was used to analyze the data in this review. The narrative synthesis was used to describe the study, participant and intervention characteristics. The items from the Template for Intervention Description and Replication (TIDieR) checklist were used as a guide to describe the study interventions, with descriptions about the following: what materials were used in the interventions and the process of delivery; who provided the interventions; how the interventions were delivered; where the interventions were delivered; intensity, dose and frequency of the interventions; and how well the interventions were tailored and adapted to the needs of the study population (24).

The interventions were also synthesized for their cultural congruency using the cultural and social structure dimensions of Leininger's sunrise model (technologic factors; religious and philosophical factors; kinship and social factors; cultural values, beliefs and lifeways; political and legal factors; economic factors and educational factors) (23). The narrative synthesis also included an assessment of the risk of bias of the studies and an analysis and a discussion of some of the confounders that were apparent across the studies.

Results

Literature search

The literature search yielded 1,259 titles and abstracts. All abstracts were reviewed, and 999 were excluded because they did not meet the selection criteria. A total of 260 studies were selected for full-text review. Of those, 251 were excluded because they did not include migrant South Asian adults with T2DM. A total of 9 studies remained at the end of the full-text screening. Because 4 of the included citations represented RCTs, only studies with an RCT design were included, yielding a total of 4 studies in this review (25—28) (Figure 1).

Study characteristics

The included studies were published between 1997 and 2017 and conducted in the United Kingdom (n=3, 75%) and The Netherlands (n=1, 25%). All 4 studies were RCTs, 2 of which were cluster RCTs (25,28). The locations for the delivery of the interventions were identified in all 4 studies. The locations included general practice (25—28), a diabetes centre (26) and an outpatient clinic (27), with follow-up periods ranging from 6 months to 2 years (Table 1).

Participant characteristics

Sample sizes varied from 113 (27) to 1,486 (25) participants. The interventions were delivered to both men and women of South Asian descent and were reported to be ≥50 years of age. Two studies (50%) reported on the number of years participants had been living with T2DM and type of diabetes-related treatment, which was >20 years and oral hypoglycemic agents, respectively (25,28). The mean baseline of participant's A1C across the studies ranged from 7.8% to 8.4% in the intervention arm and 8.1% to 8.6% in the control arm (25—28).

Intervention characteristics

Dose

None of the studies reported on the duration and amount (length of sessions delivered) of the DSME and DSMS interventions delivered to participants. Three studies (75%) reported on the
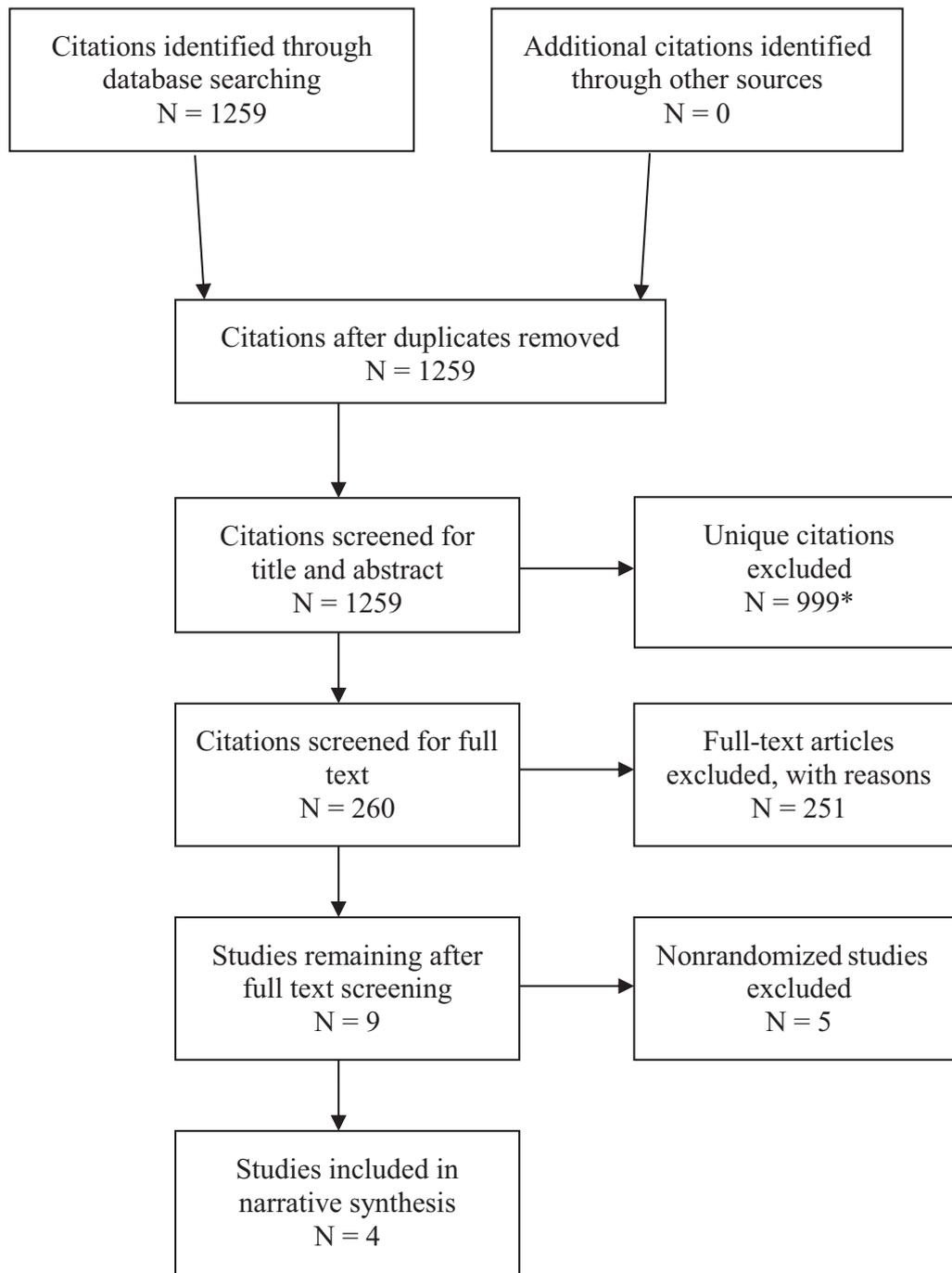
Figure 1. Literature search flowchart. *Studies were excluded for >1 reason at the title and abstract level (excluded for incorrect population and study design).

frequency of providing the sessions, which were described as weekly clinics and followed every 2 months (25), 4 to 7 visits for the first 3 months with decreasing visits after (27) and weekly sessions (28) (Table 2).

Mode of delivery

A mix of strategies were used to deliver the DSME and DSMS interventions, which included written (26,27) and verbal (25,27,28) mediums. The written format for intervention delivery included flashcards and educational booklets and packages (26,27), and the verbal format included face-to-face meetings with individual participants and audio recordings (25—28) (Table 2).

Teaching method

An educational teaching method was included in the interventions to relay diabetes-related information (i.e. general nutritional information, a carbohydrate variation list based on Asian cooking practices, blood glucose monitoring) (26,27) through formal, 1-on-1 sessions. The educational teaching methods were delivered by the following interventionists: link workers (i.e. lay members of the South Asian community who assisted health-care providers in delivering language-specific diabetes education) (25,26,28) and health-care providers (i.e. community diabetes specialist nurse and dietitian) (25—28) (Table 2).

Table 1
Study characteristics

Characteristics	Bellary et al (25)	Hawthorne and Tomlinson (26)	Middelkoop et al (27)	O'Hare et al (28)
Country, setting and sample size	UK; 7 general practices in Coventry and 14 in Birmingham (n=1,486)	UK—Manchester Diabetes Centre and 10 neighbouring general practices (n=201)	The Hague, Netherlands—3 general practices and 1 outpatient clinic (n=113)	UK—4 general practices in Foleshill Coventry and 2 in East Birmingham (n=361)
Study design	Cluster RCT	RCT	RCT	Cluster RCT
Population	Adults of South Asian origin with T2DM	Pakistani patients living with T2DM	Surinam South Asians patients with T2DM	Adults of South Asian ethnicity (Indian, Pakistani and Bangladeshi) with T2DM
Intervention	4 h/wk of additional time by link workers and a community nurse specializing in diabetes	Ten pictorial flashcards (content developed by a dietitian and link worker) An education package by a link worker to deliver diabetes education	Diabetes education delivered via an audio-cassette recorded in the Surinam-Hindi language Two booklets containing nutrition-specific information related to South Asian cuisine and frequent meetings with dietitians and nurses	Weekly research clinics facilitated with additional educational and clinical support provided by a community diabetes specialist nurse Asian link workers provided the education
Key findings	Significant reductions in A1C based on nonadjusted data (−0.18%; 95% CI, −0.34 to −0.01; p=0.037). Data adjusted for confounding and confounding clustering showed no significant reduction in A1C after years of follow up	Mean difference in reduction of A1C at 6 months postintervention; however, this was not a statistically significant difference (−0.34%; 95% CI, −0.81 to 0.13)	Significant reductions in A1C based on nonadjusted data (p=0.02) and after controlling for differences in age, sex and initial A1C (p=0.004)	More patients in the intervention group were started on insulin and had the dose and/or number of oral hypoglycemic agents increased; however, no significant reductions in A1C were noted after 1 year postintervention (−0.03%; 95% CI, −0.36 to 0.3; p=0.866)

A1C, glycated hemoglobin; *CI*, confidence interval; *RCT*, randomized controlled trial; *T2DM*, type 2 diabetes mellitus; *UK*, United Kingdom.

Intervention effectiveness

Inconsistent findings were found regarding the overall effectiveness of the interventions, with most (n=3) (25,26,28) demonstrating statistically nonsignificant findings. More specifically, Bellary et al (25) delivered a nurse-led culturally sensitive enhanced care package across inner city practices. The aim of the intervention was to improve cardiovascular risk factors among South Asian patients living with T2DM; however, no statistically significant difference between the intervention and control arms was found related to total cholesterol and A1C. Further, the nurse-led intervention was also not found to be cost effective.

Similarly, Hawthorn and Tomlinson (26) and O'Hare et al (28) delivered a structured pictorial teaching program within outpatient hospitals and/or diabetes clinics and enhanced care using Asian link workers and nurses, respectively. Overall, no statistically significant differences were noted to participant's A1C postintervention in either study (26,28). Contrary, Middelkoop et al (27) delivered diabetes-related education by a nurse and dietitian using audio-cassettes containing general diabetes-related information recorded in the participant's language and 2 booklets pertaining to general information on nutrition specific to the South Asian diet. A statistically significant difference in A1C was found between the

Table 2
Intervention characteristics according to Leininger's sunrise model

Intervention characteristics	Bellary et al (25)	Hawthorne and Tomlinson (26)	Middelkoop et al (27)	O'Hare et al (28)
Technologic factors	No information provided	No information provided	The use of an audio-cassette containing language-specific general diabetes information	No information provided
Religious and philosophical factors	Link workers provided language-specific education/ interpretation; no details about religious considerations provided	Link worker provided language-specific education on an individual basis at participant's preferred place; no details about religious considerations provided	No information provided	Link workers provided language-specific education; however, no details about religious considerations provided
Kinship and social factors	No information provided	Interviews were conducted on a 1-to-1 basis in the participant's preferred language and location by the link worker; no specific details provided about sex roles and how they were addressed	No details provided about the nature of the clinic visits (i.e. 1-to-1, group sessions, coed); no specific details provided about sex roles and how they were addressed	No information provided
Cultural values, beliefs and lifeways	Link workers provided language-specific education/ interpretation; no further details about cultural considerations provided	Pictorial flashcards depicted photographs containing Asian models, utensils and food	Details about content of the 2 educational booklets on South Asian cooking not described; unable to determine how cultural considerations were addressed	Link workers provided language-specific education; however, no details about cultural considerations provided
Political and legal factors	No information provided	No information provided	No information provided	No information provided
Economic factors	No information provided	No information provided	No information provided	No information provided
Educational factors	Language-specific education delivered via the link worker	Interviews conducted in participant's preferred language	Language-specific education recorded on the audio-cassette	Language-specific education delivered via the link worker

Table 3
Risk of bias assessment across included studies

Study	Sequence generation	Allocation concealment	Blinding of participants, personnel and outcome assessors	Incomplete outcome data	Selective outcome reporting	Other sources of bias
Bellary et al (25)	Unclear	Unclear	Unclear	Yes	Yes	Unclear
Hawthorne and Tomlinson (26)	Yes	Unclear	Unclear	Yes	Yes	Unclear
Middelkoop et al (27)	No	Unclear	Unclear	Unclear	Yes	Unclear
O'Hare et al (28)	Unclear	Unclear	Unclear	Yes	Yes	Unclear

intervention and control arm after controlling for age, sex and initial A1C, with A1C improvements noted in the intervention arm.

Interventions assessed as per Leininger's sunrise model

The interventions in the 4 studies were assessed according to the 7 factors that comprise the environmental context, language and ethnohistory component of Leininger's sunrise model. Specific to technologic factors, only one study (27) provided participants, in the intervention arm, with an audio-cassette containing general diabetes information in the Surinam-Hindi language. Specific to the religious, philosophical, political, legal, economic, kinship and social factors, no details from the studies were provided. Specific to cultural values, beliefs and lifeways, the studies provided some information regarding the inclusion of language and cultural-specific education (i.e. educational booklets; flashcards containing Asian models, utensils and foods; carbohydrate variation list based on South Asian cooking practices); however, no other information was provided regarding cultural considerations. Specific to educational factors, all studies provided diabetes education to participants in their preferred language; this language preference was used in the development of educational materials given to participants and during interviews (25–28).

Risk of bias assessment

Risk of bias was assessed using the Cochrane Risk of Bias tool and it was found that sequence generation was adequately conducted in only one study (26). All studies were free of selective outcome reporting because A1C outcome data were provided after delivery of the intervention, 3 studies adequately addressed incomplete outcome data (25,26,28) and all studies lacked clarity and information about allocation concealment, blinding of participants, personnel and outcome assessors and other sources of bias. Information regarding contamination or cointerventions was not reported in any of the studies. This information is important to report because contamination may occur when study participants are in contact with one another for periods of time (i.e. waiting rooms, clinic visits) and participants (in either the intervention or control arm) receive additional therapeutic interventions, all of which influence the intervention effect (29). Additionally, the presence of confounding variables, specifically length of diabetes duration, type of diabetes treatment and level of education, was not reported across all studies and has been found to affect the degree of A1C level changes after any given DSME and/or DSMS intervention, highlighting the importance for such information (Table 3).

Discussion

DSME and DSMS are evidence-based interventions that are important resources for providing education and support for persons living with T2DM. This review focused on examining the effectiveness of DSME and DSMS interventions in reducing A1C levels and the cultural congruency of such interventions for migrant South Asian persons living with T2DM.

Overall, findings of this review showed that most (75%) of the DSME and DSMS interventions were not effective in reducing A1C levels among the migrant South Asian population. Only one study (27) reported a statistically significant reduction in A1C levels in the intervention arm, with a 0.42% reduction in A1C ($p=0.02$) for nonadjusted data, and a 0.5% reduction in A1C ($p=0.004$) after data that were adjusted. However, because of the lack of reporting of critical information about methodology (i.e. allocation concealment, blinding, contamination, inadequate methods of randomization), and weak internal validity of this primary study, these findings should be interpreted with caution. There are several potential explanations for the nonsignificant findings of the effectiveness of DSME and DSMS interventions on A1C levels among most of the studies. First, although the study population included persons of South Asian descent, there is considerable diversity and heterogeneity in terms of geographic descent, language, dietary practices, beliefs and religion among this group, which may contribute to the differences in individual's perception of health problems, engagement in behavioural changes, perceived acceptability, uptake, adherence and outcomes of such evidence-based interventions (18,30). Second, apart from the diversity that is present among migrant South Asians, it is important to note that there may also be sociodemographic differences (i.e. level of education, occupation, employment) and length of time living in the country among this population, which may influence participant's social determinants of health. The lack of information available in the studies makes it difficult to determine how the participant's current health status and access to health-care resources for the management of diabetes and diabetes-related complications and/or comorbidities influenced the A1C outcomes. For example, education is related to either higher or lower levels of education, which may lead to increased or decreased prospects of attaining high- or low-paying employment and, in turn, influence job security and access to health-care services, transportation (to travel to clinics and appointments), medication and nutritional foods, which are all resources needed for integrating DSME and DSMS interventions (31) and subsequent effective management of diabetes.

Third, there was only one study (26) that reported adequate sequence generation using random number tables. This may potentially indicate that participants enrolled in the intervention and control arms were not equally balanced. In such a case, the intervention arm could have disproportionally contained participants with elevated A1C levels in comparison with the control arm. Higher A1C levels at baseline have been shown to result in a greater reduction in A1C levels after the intervention (32), potentially explaining the statistically significant findings from one of the studies (27) despite its limitation in internal validity. Finally, the DSME and DSMS interventions are considered to be complex interventions (i.e. number of components, behaviours, groups,

outcomes) (33), which may be challenging to implement with fidelity and, in turn, ensure valid conclusions are drawn regarding the overall effectiveness of the intervention (34), such as those included in this review.

Specific to the cultural congruity of the DSME and DSMS interventions to migrant South Asian persons, all studies delivered the intervention based on the participant's preferred language and incorporated culturally sensitive dietary information primarily by link workers, who were persons of the same cultural group. However, very little information was presented on how link workers provided and integrated culturally congruent care based on the diverse religious, kinship and social factors of participants and the influence of their own personal characteristics (i.e. ethnic descent, religious background, sex, age, level of education, beliefs, health practices) on the delivery of the intervention. As a result of the heterogeneity in the migrant South Asian population, there may have been a misfit between the participants and link workers, potentially influencing participants' engagement in behavioural changes, uptake adherence and, in turn, the nonsignificant study findings related to A1C levels. This in turn highlights the importance of rethinking the ways in which South Asians are labelled as one ethnic group and how researchers and health-care providers adapt and design culturally tailored DSME and or DSMS interventions for this population.

Conclusions

This systematic review examined the effectiveness (on A1C levels) and cultural congruence (based on Leininger's sunrise model) of DSME and DSMS interventions for migrant South Asian adults living with T2DM. The overall effectiveness of the interventions was found to be statistically nonsignificant on A1C levels; however, potential reasons are related to the heterogeneity (i.e. religion, beliefs, health practices, language) of the South Asian population, sociodemographic differences (i.e. level of education, access to health-care resources), sequence generation of the studies, challenges in intervention fidelity of complex interventions and the misfit of interventionists (specifically the link workers) in delivering the intervention to participants. All studies were delivered to participants in their preferred language, and some of the educational content was culturally tailored to the South Asian culture; however, no information was reported on any other adaptations made specific to religious, philosophical, political, legal, economic, kinship and social factors. It is also important to recognize that only 4 RCTs were found to have studied the effects of DSME and DSMS interventions on migrant South Asian adults with T2DM. This speaks to the urgent need to study diabetes self-management behaviours in this high-risk population, along with using correct methodologic rigorous procedures of adequate reporting to ensure validity of the results.

Because South Asians are the largest visible ethnic minority population in Canada, and also at high risk for developing diabetes, further research in the West needs to open its doors and explore the vast diversity of this population in relation to developing, testing and implementing effective and feasible options to deliver DSME and DSMS to this much needed population. The findings from this study highlight the importance of rethinking the way in which South Asians are labelled as a homogenous group and accounting for such differences when adapting and designing culturally tailored DSME and or DSMS interventions in clinical practice.

Author Disclosures

Conflicts of interest: None.

Author Contributions

All authors contributed to the study question, methods, implementation and analyses. All authors contributed to the writing and edits of the manuscript. NN, DS, TT, and JY contributed to the research design, data collection and analysis. All authors assisted with the manuscript write-up and review.

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