Effectiveness of educational programs using Diabetes Conversation Map tools on the health outcomes of people with type 2 diabetes: a systematic review protocol

Ana Filipa Cardoso¹,²,³ • Daniela Cardoso¹,²,³ • Helena Felizardo¹,²,³ • João Apóstolo¹,²,³

¹Health Sciences Research Unit: Nursing (UICISA: E), Nursing School of Coimbra (ESEnfC), Coimbra, Portugal, ²Nursing School of Coimbra (ESEnfC), Coimbra, Portugal, and ³Portugal Centre for Evidence-Based Practice: A JBI Centre of Excellence, Coimbra, Portugal

ABSTRACT

Objective: The objective of this review is to determine the effectiveness of educational programs using Diabetes Conversation Map on health outcomes of people with type 2 diabetes.

Introduction: Diabetes Conversation Map has been used in the context of diabetes self-management education as a resource for managing type 2 diabetes. There is a need to determine the effectiveness of this non-pharmacological intervention on health outcomes.

Inclusion criteria: This review will consider studies that focus on adults with type 2 diabetes, aged ≥18 years, in any context that implemented educational programs using Diabetes Conversation Map. The following outcomes will be explored: self-care, diabetes knowledge, empowerment, diabetes distress and quality of life, glycated hemoglobin, blood pressure, and body mass index as assessed by any validated instrument.

Methods: This systematic review will be conducted in accordance with JBI methodology for systematic reviews of effectiveness. Any published and unpublished sources of information in English, Spanish, and Portuguese will be considered, with no geographical or cultural limitations. All identified studies will be collated and uploaded into EndNote and duplicates removed. Two independent reviewers will screen the studies based on their titles and abstracts, and then screen the full text against the inclusion criteria. Eligible studies will be critically appraised by two independent reviewers using the standard JBI critical appraisal instruments. Data will be extracted by two independent reviewers using the JBI data extraction tool. The study selection process will be presented using a PRISMA flow diagram. Studies will, where possible, be pooled in statistical meta-analysis.

Systematic review registration number: PROSPERO CRD42020154253

Keywords: Conversation Map; diabetes self-management education and support; health related-outcomes; systematic review; type 2 diabetes mellitus


Introduction

Diabetes is the most common noncommunicable disease worldwide. Its incidence is increasing and it affects around 463 million people worldwide.¹ In 2019, more than 59 million people in the European region had diabetes; it is estimated that by 2045 this number will rise to 68 million.¹ Macrovascular and microvascular complications of diabetes, along with lower-extremity amputations, are responsible for much of the burden associated with diabetes.²

Diabetes-related complications are resulting in increasing disability, reduced life expectancy, and massive health costs. In addition to the human suffering that diabetes-related complications cause to patients and their families, economic costs are also a significant obstacle to economic development.³ A

Correspondence: Ana Filipa Cardoso, fcardoso@esenfc.pt
The authors declare no conflicts of interest.
DOI: 10.11124/JBIES-20-00144
significant proportion of the human and economic burden of diabetes can be prevented.1

Diabetes self-management education and support (DSMES) is a critical element of care for all people with diabetes.4 The DSMES is a continuous process that intends to develop knowledge, skills, and ability for diabetes self-care.5 The DSMES aims to support informed decision-making, problem-solving, self-care ability, and co-creating with health care professionals for solutions with an impact on health-related outcomes and quality of life.7

High-quality DSMES is associated with long-term, positive health outcomes, improving, for example, patient self-management, patient satisfaction, and glucose levels.4,5 A systematic review6 suggested that DSMES has the potential to achieve significant reductions in glycated hemoglobin (HbA1C). Diabetes-related complications can be prevented or delayed, thus reducing hospital admissions and readmissions, as well as health care costs related to a lower risk for complications.5 The health benefits of self-management programs seem to persist over time.7 Evidence shows that group-based DSMES in people with type 2 diabetes results in more significant improvements in clinical, lifestyle, and psychosocial outcomes when compared to single interventions.8

Diabetes Conversation Map is an innovative therapeutic group education approach for the implementation of DSMES. This education approach was created by The Healthy Interactions, a global leader in health education, in collaboration with the International Diabetes Federation, and was sponsored by Lilly Diabetes.9 This evidence-based education method follows clinical guidelines by the American Diabetes Association and uses interactive group participation to empower people with diabetes to become actively involved in managing the disease.9 The overall goal is to encourage participants to make informed decisions that lead to improved self-management of their diabetes.10

This strategy allows people to take responsibility for identifying and developing the best self-care solutions for their life; thus, people are more likely to embrace changes.11 The maps are a series of pictorial guides. Groups of three to 10 people go through a learning experience that enables them to internalize information related to diabetes self-care management.11,12

Through a series of metaphors, people from different social and cultural backgrounds get engaged in discussion. They are invited to share their beliefs and experiences about living with diabetes.13 All participants learn facts and information related to diabetes self-management and become empowered to find the best possible solutions for their diabetes-related problems.13 Health care professionals serve as facilitators, guiding the discussion and engaging people to be more proactive in self-care management.11 The activity cards are an additional resource to address issues about diabetes and are used to initiate discussion through which participants gain knowledge and self-management information from each other.11 Diabetes Conversation Map has been used in more than 120 countries and translated into 38 languages.14

This patient-centered approach has shown significant improvement of clinical outcomes (glycated hemoglobin)15 and has increased patients’ knowledge and understanding of diabetes, their self-care motivation and acceptance of personal responsibility, their self-care adherence, and success. This has enabled them to be more confident and ready to make behavior changes,11 as well as to improve diabetes-related knowledge16 or even reduce diabetes distress.17

Furthermore, many participants preferred this approach over other educational methods.10 Diabetes Conversation Map also had a positive impact on health care professionals’ knowledge, attitude, and confidence while delivering DSMES.10,13 However, there are conflicting results as to whether the intervention increases positive outcomes for patients with diabetes. In a systematic review, Srulovici et al.18 highlighted that almost all studies examined objective health measures, with most indicating non-significant differences between the intervention and the control groups.

A preliminary search of the JBI Database of Systematic Reviews and Implementation Reports, the Cochrane Database of Systematic Reviews, PROSPERO, CINAHL, MEDLINE, and a free search on Google revealed the existence of two systematic reviews published on this topic.15,18 This systematic review will develop a comprehensive systematic search strategy aimed at finding available evidence, including gray/unpublished literature, and describing the inclusion criteria. These aspects were not established clearly in the systematic reviews of Yang and Fang15 and Srulovici et al.18 Yang and Fang15 included only randomized controlled trials.
and only those published until 2015. Similarly, Sru-
lovici et al.18 only included studies written in
English. Additionally, the papers’ publication dates
are 2016 and 2017, respectively, which means that
the last updates were published more than three
years ago and don’t capture the numerous, more-
recent studies related to the review question.17,19-24
Therefore, the purpose of this systematic review is to
determine the effectiveness of educational programs
using Diabetes Conversation Map on health out-
comes of people with type 2 diabetes.

Review question
What is the effectiveness of educational programs
using Diabetes Conversation Map on self-care,
diabetes knowledge, empowerment, diabetes dis-
tress, quality of life, glycated hemoglobin, blood
pressure, and body mass index of people with type
2 diabetes?

Inclusion criteria
Participants
The review will consider studies that include adults
aged ≥18 years, diagnosed with type 2 diabetes at
any stage of the disease and in any context. For the
scope of this review, type 2 diabetes will be consid-
ered as insulin resistance, where the body does not
fully respond to insulin.1 Studies that include adults
with other types of diabetes will be excluded.

Interventions
This review will consider studies that evaluate pro-
grams using Diabetes Conversation Map as an edu-
cational tool, alone or in combination with other
non-pharmacological interventions, regardless of the
type of intervention delivery, frequency, and dura-
tion. This group education approach for the imple-
mentation of DSMES follows the clinical guidelines
of the American Diabetes Association.4 It uses inter-
active group participation to empower people with
diabetes to become actively involved in decision-
making and self-care.

Comparators
This review will consider studies that compare the
intervention to any comparators or other nonphar-
camological interventions, such as the usual teaching
method.

Outcomes
This review will consider studies that reported at
least one of the following health outcomes:
• self-care, as assessed by any generic or disease-
specific validated instrument;
• diabetes knowledge, as assessed by any validated
instrument;
• empowerment, as assessed by any generic or
disease-specific validated instrument;
• diabetes distress, as assessed by any validated
instrument;
• quality of life or health-related quality of life, as
assessed by any generic or disease-specific vali-
dated instrument;
• glycated hemoglobin, blood pressure, and body
mass index.

Types of studies
This review will consider both experimental and
 quasi-experimental study designs, including ran-
domized controlled trials, non-randomized con-
trolled trials, before and after studies, and
interrupted time-series studies. In addition, analyti-
cal observational studies, including case-control
studies and cohort studies will be considered for
inclusion. Studies published in English, Portuguese,
and Spanish will be included. The search will be
limited to studies published after 2004, the year the
Conversation Map™ methodology was created.25

Methods
The proposed systematic review will be conducted in
accordance with JBI methodology for systematic
reviews of effectiveness.26

Search strategy
The search strategy will aim to locate both pub-
lished and unpublished studies. An initial limited
search of MEDLINE and CINAHL was undertaken
to identify articles on the topic. The text words
contained in the titles and abstracts of relevant
articles, and the index terms used to describe the
articles were used to develop a full search strategy
for PubMed (see Appendix I). The search strategy,
including all identified keywords and index terms,
will be adapted for each included information
source. The reference list of all studies selected
for critical appraisal will be screened for additional
studies.
The databases to be searched include MEDLINE (via PubMed), CINAHL (via EBSCO), Cochrane Central Register of Controlled Trials, LILACS, ERIC (via EBSCO), Psychology and Behavioral Sciences Collection, Web of Science Core Collection, and Scopus. Sources of unpublished studies and gray literature to be searched include Open Grey, Banco de teses da CAPES, and Repositório Científico de Acesso Aberto de Portugal. Trial registries to be searched include: ClinicalTrials.gov, World Health Organization (WHO), and Australian New Zealand Clinical Trials Registry.

**Study selection**

Following the search, all identified citations will be collated and uploaded into EndNote v.X7 (Clarivate Analytics, PA, USA) and duplicates removed. Titles and abstracts will then be screened by two independent reviewers for assessment against the inclusion criteria for the review. Potentially relevant studies will be retrieved in full and their citation details imported into the JBI System for the Unified Management, Assessment and Review of Information (JBI SUMARI; JBI, Adelaide, Australia). The full text of selected citations will be assessed in detail against the inclusion criteria by two independent reviewers. Reasons for exclusion of full-text studies that do not meet the inclusion criteria will be recorded and reported in the systematic review. Any disagreements that arise between the reviewers will be resolved through discussion or with a third reviewer. The results of the search will be reported in full in the final systematic review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) flow diagram.

**Assessment of methodological quality**

Eligible studies will be critically appraised by two independent reviewers using the JBI standardized critical appraisal tools for randomized controlled trials, quasi-experimental studies, case control studies, and cohort studies.

Authors of papers will be contacted to request missing or additional data for clarification, where required. Any disagreements that arise between the reviewers will be resolved through discussion or with a third reviewer. The results of the critical appraisal will be reported in narrative form and in a table. All studies, regardless of the results of their methodological quality, will undergo data extraction and synthesis (where possible).

**Data extraction**

Data will be extracted from studies included in the review by two independent reviewers using the standardized JBI data extraction tool from JBI SUMARI. The data extracted will include specific details about the populations, study methods, interventions, and outcomes of significance to the review objective. Any disagreements that arise between the reviewers will be resolved through discussion or with a third reviewer. Authors of papers will be contacted to request missing or additional data, where required.

**Data synthesis**

Studies will, where possible, be pooled with statistical meta-analysis using JBI SUMARI. Effect sizes will be expressed as either odds ratios (for dichotomous data) or weighted (or standardized) final post-intervention mean differences (for continuous data), and their 95% confidence intervals will be calculated for analysis. Heterogeneity will be assessed statistically using the standard $\chi^2$ and $I^2$ tests. Statistical analyses will be performed using the random-effects model to allow generalization. However, if less than five studies are included in the meta-analysis, the fixed-effects model will be used where appropriate. Subgroup analyses will be conducted where there is sufficient data to investigate, for example, the duration of intervention and the use of Conversation Maps alone or in combination with other interventions. Sensitivity analyses will be conducted to test decisions made regarding the inclusion or exclusion of studies in the meta-analysis based on sample size and methodological quality. Where statistical pooling is not possible, the findings will be presented in narrative form, including tables and figures, to aid in data presentation, where appropriate.

A funnel plot will be generated using RevMan v.5.3 (ProQuest LLC, Ann Arbor, USA) to assess publication bias if there are 10 or more studies included in a meta-analysis. Statistical tests for funnel plot asymmetry (Egger test, Begg test, Harbord test) will be performed where appropriate.

**Assessing certainty in the findings**

The Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) approach
for grading the certainty of evidence will be followed and a Summary of Findings will be created using GRADEPro GDT software (McMaster University, ON, Canada). The Summary of Findings will present the following information where appropriate: absolute risks for the treatment and control, estimates of relative risk, a ranking of the quality of the evidence based on the risk of bias, directness, heterogeneity, precision, and risk of publication bias of the review results. The following outcomes will be reported in the Summary of Findings: clinical outcomes (glycated hemoglobin, blood pressure, and body mass index); self-care; diabetes knowledge; empowerment; diabetes distress; and quality of life.

Acknowledgments

The Health Sciences Research Unit: Nursing (UICISA: E), which is hosted by the Nursing School of Coimbra (ESEnfC) and funded by the Foundation for Science and Technology (FCT), for their support.

References

## Appendix I: Search strategy

### MEDLINE (PubMed)

Search conducted July 23, 2020

<table>
<thead>
<tr>
<th>Query</th>
<th>Results retrieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Search: (((((((((((((((((“Conversation maps”[Title/Abstract]) OR (“Conversation map”[Title/Abstract]) OR (“Learning guides”[Title/Abstract]) OR (“Learning guide”[Title/Abstract]) OR (“therapeutic maps”[Title/Abstract]) OR (“therapeutic map”[Title/Abstract]) OR (“Education programs”[Title/Abstract]) OR (“Education programme”[Title/Abstract]) OR (“Educational programmes”[Title/Abstract]) OR (“Education interventions”[Title/Abstract]) OR (“Education intervention”[Title/Abstract]) OR (“Educational tool”[Title/Abstract]) OR (“Educational tools”[Title/Abstract]) OR (“Conversion-based tool”[Title/Abstract]) OR (“Conversion-based tools”[Title/Abstract]) OR (“Healthy-Interactions”[Title/Abstract]) OR (“Healthy Interactions”[Title/Abstract]) OR (“Educational therapy”[Title/Abstract]) OR (“Educational strategies”[Title/Abstract]) OR (“Educational strategy”[Title/Abstract]) AND (((((((((((((((((((((((((((“glycated hemoglobin”[Title/Abstract]) OR (“Hb A1c”[Title/Abstract]) OR (HbA1c[Title/Abstract]) OR (“glycosylated hemoglobin”[Title/Abstract]) OR (“body mass index”[Title/Abstract]) OR (bmi[Title/Abstract]) OR (self-care[Title/Abstract]) OR (“self care”[Title/Abstract]) OR (“self management”[Title/Abstract]) OR (self-management[Title/Abstract]) OR (knowledge[Title/Abstract]) OR (empower”[Title/Abstract]) OR (distress [Title/Abstract]) OR (“life quality”[Title/Abstract]) OR (“quality of life”[Title/Abstract]) OR (“health-related quality of life”[Title/Abstract]) OR (((((((“Quality of Life”[Mesh]) OR (“Knowledge”[Mesh]) OR (“Self-Management”[Mesh]) OR (“Self Care”[Mesh]) OR (“Body Mass Index”[Mesh]) OR (“Blood Pressure”[Mesh]) OR (“Glycated Hemoglobin A”[Mesh])))) Filters: English, Portuguese, Spanish, from 2004 – 2020)</td>
<td>1714</td>
</tr>
<tr>
<td>Search: (((((((((((((((((((((((“(glycated hemoglobin”[Title/Abstract]) OR (“Hb A1c”[Title/Abstract]) OR (HbA1c[Title/Abstract]) OR (“glycosylated hemoglobin”[Title/Abstract]) OR (“body mass index”[Title/Abstract]) OR (bmi[Title/Abstract]) OR (self-care[Title/Abstract]) OR (“self care”[Title/Abstract]) OR (“self management”[Title/Abstract]) OR (self-management[Title/Abstract]) OR (knowledge[Title/Abstract]) OR (empower”[Title/Abstract]) OR (distress [Title/Abstract]) OR (“life quality”[Title/Abstract]) OR (“quality of life”[Title/Abstract]) OR (“health-related quality of life”[Title/Abstract]) OR (((((((“Quality of Life”[Mesh]) OR (“Knowledge”[Mesh]) OR (“Self-Management”[Mesh]) OR (“Self Care”[Mesh]) OR (“Body Mass Index”[Mesh]) OR (“Blood Pressure”[Mesh]) OR (“Glycated Hemoglobin A”[Mesh])))) Filters: English, Portuguese, Spanish, from 2004 – 2020)</td>
<td>1,902,085</td>
</tr>
<tr>
<td>Search: (((((((“Diabet”[Title/Abstract]) OR (“Diabetes Mellitus”[Mesh])) AND ((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((“Body Mass Index”[Mesh]) OR (“Body Mass Index”[Mesh]) OR (“Blood Pressure”[Mesh]) OR (“Glycated Hemoglobin A”[Mesh])))) Filters: English, Portuguese, Spanish, from 2004 – 2020)</td>
<td>693,471</td>
</tr>
<tr>
<td>Search: (Diabet”[Title/Abstract]) OR (“Diabetes Mellitus”[Mesh])</td>
<td>685,009</td>
</tr>
<tr>
<td>Search: (Quality of Life”[Mesh]) OR (“Knowledge”[Mesh]) OR (“Self-Management”[Mesh]) OR (“Self Care”[Mesh]) OR (“Body Mass Index”[Mesh]) OR (“Blood Pressure”[Mesh]) OR (“Glycated Hemoglobin A”[Mesh])))) Filters: English, Portuguese, Spanish, from 2004 – 2020)</td>
<td>194,764</td>
</tr>
<tr>
<td>Search: “Knowledge”[Mesh]</td>
<td>11,339</td>
</tr>
<tr>
<td>Search: “Self-Management”[Mesh]</td>
<td>2247</td>
</tr>
<tr>
<td>Search: “Self Care”[Mesh]</td>
<td>54,608</td>
</tr>
<tr>
<td>Search: “Body Mass Index”[Mesh]</td>
<td>126,636</td>
</tr>
</tbody>
</table>

© 2021 JBI. Unauthorized reproduction of this article is prohibited.
<table>
<thead>
<tr>
<th>Query</th>
<th>Results retrieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Search: &quot;Blood Pressure&quot;[Mesh]</td>
<td>290,104</td>
</tr>
<tr>
<td>Search: “Glycated Hemoglobin A”[Mesh]</td>
<td>34,985</td>
</tr>
<tr>
<td>Search: “Diabetes Mellitus”[Mesh]</td>
<td>425,342</td>
</tr>
<tr>
<td>Search: (((((((((((((((((((“glycated hemoglobin”[Title/Abstract]) OR (“Hb A1c”[Title/Abstract])) OR (“glycosylated hemoglobin”[Title/Abstract])) OR (“blood pressure”[Title/Abstract])) OR (“body mass index”[Title/Abstract])) OR (bmi[Title/Abstract])) OR (self-care[Title/Abstract])) OR (“self care”[Title/Abstract])) OR (“self management”[Title/Abstract])) OR (self-management[Title/Abstract])) OR (knowledge[Title/Abstract])) OR (empower”[Title/Abstract])) OR (distress[Title/Abstract])) OR (“life quality”[Title/Abstract])) OR (“quality of life”[Title/Abstract])) OR (“health-related quality of life”[Title/Abstract]))</td>
<td>1,629,186</td>
</tr>
<tr>
<td>Search: (((((((((((((((((((“Conversation maps”[Title/Abstract]) OR (“Conversation map”[Title/Abstract])) OR (“Learning guides”[Title/Abstract])) OR (“Learning guide”[Title/Abstract])) OR (“therapeutic maps”[Title/Abstract])) OR (“therapeutic map”[Title/Abstract])) OR (“Education programs”[Title/Abstract])) OR (“Education program”[Title/Abstract])) OR (“Educational programme”[Title/Abstract])) OR (“Educational programmes”[Title/Abstract])) OR (“Education interventions”[Title/Abstract])) OR (“Education intervention”[Title/Abstract])) OR (“Educational tools”[Title/Abstract])) OR (“Educational tool”[Title/Abstract])) OR (“Conversation-based tool”[Title/Abstract])) OR (“Conversation-based tools”[Title/Abstract])) OR (Healthy-Interactions[Title/Abstract])) OR (“Healthy Interactions”[Title/Abstract])) OR (“Educational therapy”[Title/Abstract])) OR (“Educational strategies”[Title/Abstract])) OR (“Educational strategy”[Title/Abstract]))</td>
<td>33,869</td>
</tr>
<tr>
<td>Search: Diabet”[Title/Abstract]</td>
<td>635,567</td>
</tr>
</tbody>
</table>