The Effect of Patient Empowerment on Anxiety, Depression or Health-Related Quality of Life in Patients With Type 2 Diabetes: A Systematic Review Protocol

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Abstract

Background. Type 2 Diabetes Mellitus (T2DM) is one of the most prevalent health problems worldwide. Besides metabolic and cardiovascular complications, nearly one in four patients with T2DM suffer from comorbid depression and it has been reported higher incidence and prevalence of anxiety disorders. Beyond metabolic and cardiovascular risk improvement, empowering patients could contribute to mental health and quality of life enhancement. This Systematic Review (SR) aims to analyze and synthetize the evidence about the effect of patient empowerment on anxiety, depression and health-related quality of life (HRQOL).

Methods. A SR of the literature will be conducted according to the Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA) guidelines. The review will include studies reporting the effect of patient empowerment on anxiety, depression or HRQOL in patients with a T2DM diagnosis. We will use the following databases: Medline, Embase, PsycInfo and Cochrane Library, from inception through July 2020. Additionally, the database searches will be supplemented by searching through citations and references. Literature searches, identification of eligible studies, data extraction, and bias assessment will be undertaken independently by at least two researchers. All disagreements will be resolved by an independent third reviewer. If heterogeneity between studies is too high or it is not possible to conduct a meta-analysis, a narrative analysis of the study results will be provided.

Discussion. Existing evidence suggest that empowerment-based strategies significantly improve knowledge, anxiety and depressive levels, self-care, and motivation; contributing to increase HRQOL in patients with T2DM. The results of this SR will provide a deeper understanding on the relationship between patient empowerment and psychosocial outcomes in T2DM.

Systematic review registration: PROSPERO CRD42020192429.

Background

Diabetes Mellitus (DM) is a major public health problem (1) with a large and increasing frequency and socio-economic burden worldwide (2). In 2017, the International Diabetes Foundation estimated that 451 million people all around the world had diabetes, and it is expected that this number will increase to 693 million by 2045 (2). This rise can be explained by different factors including a growth in the life expectancy of the population, together with an increase of risk factors of DM development such as obesity and sedentary lifestyles (3, 4).

DM is a chronic disease characterized by hyperglycemia, due to a scarcity of insulin (absolute or relative). It can be classified in four general categories: type 1 diabetes mellitus (T1DM), due to autoimmune β-cell destruction that leads to an absolute insulin deficiency; type 2 diabetes mellitus (T2DM), due to a progressive loss of adequate β-cell insulin secretion; gestational diabetes mellitus (GDM) and other specific types of diabetes triggered by different causes such as monogenic diabetes syndromes, exocrine pancreas diseases or chemical-induced diabetes (5). T2DM, also called noninsulin-dependent diabetes or adult-onset diabetes, accounts for approximately 90–95% of all diagnosed cases of DM (5) and is one of the most prevalent health problems nowadays (6). T2DM imposes a considerable burden on patients health and health-related quality of life (HRQOL), as well as on socioeconomic issues (7, 8).
Treatment management of T2DM is complex, requiring continuous and long-term involvement of patients to maintain daily adherence to recommendations regarding diet, physical activity and medication (9, 10). There’s a large consensus on the importance of self-care behaviors for the successful management of T2DM. However, there are several barriers, both individual and environmentally related, associated with a low adherence to treatment recommendations (11).

Nearly one in four patients with T2DM suffer from comorbid depression (12). Besides, compared to the general population, a higher incidence and prevalence of anxiety disorders has also been reported among people with T2DM (13, 14). Several authors have reported that patients with T2DM and comorbid mental health problems, such as anxiety and depression, are more likely to have diabetes complications (15) and less likely to meet the guidelines for healthy habits and self-care recommendations (16–18), with higher difficulties to achieve and maintain diabetes control.

With the aim of optimizing health outcomes and promote HRQOL, the American Diabetes Association, in its 2016 position statement about psychosocial care for people with diabetes, highlighted the need to integrate psychosocial care with person-centered medical care for people with diabetes, (19).

Person-centered care has a holistic view on patients care; focusing on the need of seeing people beyond the illness, valuing their needs and respecting their rights and dignity. One of the core elements of person-centered care is patient empowerment. The World Health Organization defines “empowerment” as a process through which people can gain control over decisions and actions affecting their health (20). Accordingly, the aim of patient empowerment is to provide them with critical thinking, skills and tools to take responsibility for their health and wellbeing, develop autonomy and self-confidence, make autonomous informed decisions and influence their own behavior in order to improve health outcomes and quality of life.

The aim of this study is to provide evidence on the effect of patient empowerment on anxiety and depressive symptoms and on the HRQOL of T2DM patients.

**Methods**

A SR of the literature will be conducted according to the Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA) statement (21), from a protocol based on the PRISMA guidelines for systematic review’s design, conducting and reporting (PRISMA-P) (22). The detail of the PRISMA-P checklist can be found in Additional file 1. This SR was registered in the International Prospective Register of Systematic Reviews (PROSPERO) on July 16th, 2020 with the registration number CRD42020192429.

**Eligibility criteria**

**Population**

Studies addressing patients with T2DM, aged 18 years or older, will be included. Studies involving children or adolescents, patients with T1DM, GDM or participants with pre-diabetes will be excluded.

**Exposure**
Studies analyzing the effect of patient empowerment on anxiety, depression or HRQOL, will be included. Despite patient empowerment has been defined in many different ways, a consensus definition is still lacking (23,24). In order to be exhaustive, this review will consider patient empowerment as an exposure factor, adding two other theoretical related concepts such as self-efficacy and patient activation (25,26).

**Outcomes**

We will include all outcomes related to anxiety and/or depressive symptomatology, including measures of distress (i.e., combination of anxiety and depression symptoms), as well as measures of general or diabetes-specific HRQOL. These outcomes are usually assessed by means of self-reported questionnaires or standardized interviews. Studies will be excluded if they did not report on anxiety, depression or HRQOL as outcome measures.

**Design**

All studies assessing the effect of patient empowerment (or one of its two theoretical related concepts, self-efficacy and patient activation) on anxiety, depression or HRQOL will be included regardless its design. Clinical trials not including a specific measure of patient empowerment, self-efficacy or patient activation will be excluded, even if the intervention is based on person-centered or shared decision-making principles. Conference abstracts, letters, commentaries, essays, book chapters, qualitative studies, study protocols and reviews will also be excluded. No language or publication year restrictions will be applied.

**Data source and search strategy**

A set of keywords on the topics of interest were identified from a previous scoping literature search. The following terms will be used individually or combined according to the Medical Subject Heading (MeSH) terms to design the search strategy: “diabetes”, “anxiety”, “depression”, “quality of life” as well as “empowerment”, “self-efficacy” and “patient activation”. Four electronic databases will be consulted: Medline, Embase, PsycInfo and Cochrane Library. We will execute monthly Medline searches until the study submission. Boolean operators, such as “AND”, “OR” and “NOT” and proximity operators like “NEAR” or “WITHIN” will be incorporated into the search strategy. Additionally, the reference list of all eligible studies will be screened in order to identify additional studies meeting our inclusion criteria. As an example, the full Medline search strategy is presented in Table 1. The same search strategy, with the required modifications, will be used for the other three electronic databases.

**Study selection**

All citations extracted from the different electronic databases will be imported into a standardized Microsoft Excel data sheet and duplicates will be removed. First, two members of the research team will independently review all titles and abstracts in order to pre-select those meeting the inclusion criteria. If disagreement, a third reviewer will be contacted. Secondly, the full-text of the potentially relevant studies will be again screened for eligibility by two reviewers. Any disagreement will be solved by discussion and consensus and a third reviewer will be consulted if needed. The studies selection process and the exclusion reasons will be documented and documented following the PRISMA's flowchart format (21).
Data extraction

From each included study, two reviewers will independently extract data on the following variables according to a standardized data extraction form in Microsoft Excel: first author, year of publication, country, number of participants, mean age, study design, setting, study population, outcomes, effect estimates for the main outcomes (i.e., Pearson's correlation, beta coefficient, risk ratio, odds ratio) and results. In case of missing data, the corresponding authors will be contacted by e-mail in order to ask them to provide the needed details.

Risk of bias assessment

To evaluate the quality of cross-sectional studies, the Joanna Briggs Institute critical appraisal checklist will be used (27). Version 2 of the Cochrane risk-of-bias tool for randomized trials (RoB 2) (28) will be used to assess the risk of bias in randomized trials. Quality assessment will be undertaken by two independent reviewers and disagreements will be solved by discussion and consensus or after consulting a third reviewer in case consensus isn’t achieved.

Data analysis

In case of having two or more combinable studies evaluating the same (or comparable) variable, a meta-analysis (MA) will be conducted, combining the results by using the inverse variance method (29). If MA is not appropriate, a narrative synthesis of the evidence will be carried out. Statistical heterogeneity between the different studies included in the MA will be evaluated with the Q and I^2 statistics (30). If Q-value is significant (p < 0.010) or I^2 > 50%, a random effects model will be applied (29) and the following variables will be explored as sources of heterogeneity: type of study (experimental/observational; prospective/retrospective); theoretical concept (empowerment, self-efficacy or patient activation), mean age and HbA1c levels at baseline, and follow-up duration. Subgroup analyses for categorical variables or meta-regression for continuous variables will be performed. Publication bias will be analyzed if there are 10 or more studies per variable, visually using funnel plots, and statistically by means of the Egger test (31).

Discussion

T2DM is one of the most prevalent chronic health conditions worldwide. Its incidence and prevalence has risen dramatically in the past decades and is expected to keep increasing over the next ten years, with the greatest growth in the lower-income countries (32). T2DM is a complex health condition that limits autonomy, HRQOL, and health expectancy, at individual level; besides a substantial socioeconomic burden. Although there is no cure for T2DM, it is possible to improve disease control and delay clinical complications and mortality by means of personalized and complex therapeutic strategies that always include empowerment and behavior change interventions, to build effective self-management capacities among patients. Adherence to self-care behaviors is not always an easy task but they are needed to achieve sustained long-term control and improve health outcomes. Psychosocial problems such as anxiety and depression have shown to be related with less self-care behaviors, so it seems necessary to address those problems and determine their potential predictive role and magnitude in T2DM patients.
Promoting the participation of people in their own healthcare is considered an ethical imperative included in the Declaration of Salzburg (33) and implies professionals providing knowledge and abilities, as well as recognizing and facilitating patient’s self-determination with regard to their autonomy as well as joining them in the decision-making process (34). Existing evidence suggest that empowering patients and helping them to get involved in their healthcare decisions could also improve their anxiety and depression symptoms (35) as well as enhance their quality of life (36). Furthermore, two SRs published in the last five years (37, 38) have shown that empowerment-based strategies may improve clinical, behavioral and psychological outcomes in patients with T2DM. More specifically, Baldoni et al. (37) reported that programs based on collective empowerment strategies lead to an increase in confidence and DM knowledge, better attitudes toward the disease and more healthy eating patterns. Likewise, Aquino et al. (38) concluded that individual empowerment-based strategies present several psychosocial benefits such as more self-care behaviors, an increase in motivation, self-efficacy and DM knowledge and better quality of life. In both SRs, MAs were also conducted to combine the results of different studies and evaluate the effectiveness of empowerment strategies in reducing HbA1c. Whereas Baldoni et al. (37) found significant evidence indicating beneficial effects of collective empowerment programs in the reduction of HbA1c, in Aquino et al. (38) no statistically significant improvement for HbA1c was found.

Even though previous SRs have highlighted the effectiveness of empowerment-based interventions in the context of DM, to our knowledge, this is the first SR to summarize current evidence about the specific relation of patient empowerment interventions, with anxiety, depression and HRQOL outcomes in patients with T2DM. Nevertheless, there could be several potential limitations in this planned SR. First, although we will perform our search in four different electronic databases and hand-searches also will be executed; potential non-identified studies cannot be discarded. The heterogeneity between studies in the terminology used to label and define patient empowerment may further increase this risk. Finally, as we won’t apply design restrictions, observational studies might be included and it is possible, therefore, that this review could not provide a conclusive answer on causality.

The results of this SR are expected to provide a deeper understanding on the relationship between patient empowerment and anxiety, depression and HRQOL in patients with T2DM, and thus help to focus on what person-centered care programs should be applied in order to provide a more ethical and effective attention to these patients.

List Of Abbreviations

DM: Diabetes Mellitus; GDM: Gestational Diabetes Mellitus; HbA1C: Glycated haemoglobin; HRQOL: Health-related quality of life; MA: Meta-analysis; MeSH: Medical Subject Heading; PRISMA: Preferred Reporting Items for Systematic reviews and Meta-Analysis; PROSPERO: International Prospective Register of Systematic Reviews; RoB 2: Version 2 of the Cochrane risk-of-bias tool for randomized trials; ROBINS-I: Risk of bias in non-randomized studies of interventions; SR: Systematic Review; T1DM: Type 1 Diabetes Mellitus; T2DM: Type 2 Diabetes Mellitus.

Declarations
**Ethics approval and consent to participate**

No ethics approval is required as this protocol is based on information from previously published data.

**Consent for publication**

Not applicable.

**Availability of data and materials**

Not applicable

**Competing interests**

The authors declare that they have no competing interests.

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**Authors' contributions**

ADD and LPP conceived and designed the study. WP helped to define and formulate the inclusion criteria and search strategy. ARS, HGP and YRF provided statistical expertise. ADD, YAP and VRG wrote the initial draft of the protocol. LGA, MBB and SGM reviewed the whole manuscript and provided substantial comments. PSA oversaw all stages of the manuscript. All authors have read, provided critical revisions and approved the final version of the final protocol.

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**References**

1. Al-Lawati JA. Diabetes mellitus: A local and global public health emergency! [Internet]. Vol. 32, Oman Medical Journal. Oman Medical Specialty Board; 2017 [cited 2020 Jul 29]. p. 177–9. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5447787/

2. Cho NH, Shaw JE, Karuranga S, Huang Y, da Rocha Fernandes JD, Ohlrogge AW, et al. IDF Diabetes Atlas: Global estimates of diabetes prevalence for 2017 and projections for 2045. Diabetes Res Clin Pract. 2018 Apr 1;138:271–81.

3. Wild S, Roglic G, Green A, Sicree R, King H. Global Prevalence of Diabetes: Estimates for the year 2000 and projections for 2030. Diabetes Care [Internet]. 2004 May [cited 2020 Jul 30];27(5):1047–53. Available from: https://pubmed.ncbi.nlm.nih.gov/15111519/

4. International Diabetes Fundation (IDF). Diabetes Atlas 6th Edition [Internet]. 2013 [cited 2020 Jul 30]. Available from: https://www.idf.org/e-library/epidemiology-research/diabetes-atlas/19-atlas-6th-
5. American Diabetes Association. 2. Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes-2020 [Internet]. Vol. 43, Diabetes care. 2020 [cited 2020 Jul 29]. p. S14–31. Available from: https://doi.org/10.2337/dc20-S002

6. Moini J. Type 2 Diabetes. In: Epidemiology of Diabetes [Internet]. Elsevier; 2019 [cited 2020 May 26]. p. 91–114. Available from: https://linkinghub.elsevier.com/retrieve/pii/B9780128168646000079

7. Cannon A, Handelsman Y, Heile M, Shannon M. Burden of Illness in Type 2 diabetes mellitus. J Manag Care Spec Pharm. 2018;24(9):S5–13.

8. Liu J, Wang R, Ganz ML, Paprocki Y, Schneider D, Weatherall J. The burden of severe hypoglycemia in type 2 diabetes. Curr Med Res Opin [Internet]. 2018 Jan 2 [cited 2020 Jul 29];34(1):179–86. Available from: https://www.tandfonline.com/doi/abs/10.1080/03007995.2017.1391080

9. Ramallo-Fariña Y, García-Pérez L, Castilla-Rodríguez I, Perestelo-Pérez L, Wägner AM, de Pablos-Velasco P, et al. Effectiveness and cost-effectiveness of knowledge transfer and behavior modification interventions in type 2 diabetes mellitus patients-the INDICA study: A cluster randomized controlled trial. Implement Sci. 2015 Apr 9;10(1).

10. Gómez-Velasco D V, Almeda-Valdes P, Martagón AJ, Galán-Ramírez GA, Aguilar-Salinas CA. Empowerment of patients with type 2 diabetes: Current perspectives. Diabetes, Metab Syndr Obes Targets Ther [Internet]. 2019 [cited 2020 Apr 27];12:1311–21. Available from: http://doi.org/10.2147/DMSO.S174910

11. Ahola AJ, Groop PH. Barriers to self-management of diabetes [Internet]. Vol. 30, Diabetic Medicine. Blackwell Publishing Ltd; 2013 [cited 2020 Jul 29]. p. 413–20. Available from: https://pubmed.ncbi.nlm.nih.gov/23278342/

12. Khaledi M, Haghighatdoost F, Feizi A, Aminorroaya A. The prevalence of comorbid depression in patients with type 2 diabetes: an updated systematic review and meta-analysis on huge number of observational studies. Vol. 56, Acta Diabetologica. Springer-Verlag Italia s.r.l.; 2019.

13. Chaturvedi SK, Manche Gowda S, Ahmed HU, Alosaimi FD, Andreone N, Bobrov A, et al. More anxious than depressed: Prevalence and correlates in a 15-nation study of anxiety disorders in people with type 2 diabetes mellitus. Gen Psychiatry. 2019 Aug 1;32(4).

14. Chaudhary R, Kumar P, Chopra A, Chabra S, Singh P. Comparative study of psychiatric manifestations among Type I and Type II diabetic patients. Indian J Psychol Med [Internet]. 2017 May 1 [cited 2020 May 8];39(3):342. Available from: http://www.ijpm.info/text.asp?2017/39/3/342/207341

15. Lloyd CE, Sartorius N, Ahmed HU, Alvarez A, Bahendeka S, Bobrov AE, et al. Factors associated with the onset of major depressive disorder in adults with type 2 diabetes living in 12 different countries: Results from the INTERPRET-DD prospective study. Epidemiol Psychiatr Sci [Internet]. 2020 [cited 2020 Jul 29];29. Available from: https://pubmed.ncbi.nlm.nih.gov/32484148/

16. Smith KJ, Pedneault M, Schmitz N. Investigation of anxiety and depression symptom co-morbidity in a community sample with type 2 diabetes: Associations with indicators of self-care. Can J Public Heal. 2015 Nov 1;106(8):e496–501.

17. Nefs G, Hendrieckx C, Reddy P, Browne JL, Bot M, Dixon J, et al. Comorbid elevated symptoms of anxiety and depression in adults with type 1 or type 2 diabetes: Results from the International Diabetes MILES
Study. J Diabetes Complications. 2019 Aug 1;33(8):523–9.

18. Naicker K, Øverland S, Johnson JA, Manuel D, Skogen JC, Sivertsen B, et al. Symptoms of anxiety and depression in type 2 diabetes: Associations with clinical diabetes measures and self-management outcomes in the Norwegian HUNT study. Psychoneuroendocrinology. 2017 Oct 1;84:116–23.

19. Young-Hyman D, De Groot M, Hill-Briggs F, Gonzalez JS, Hood K, Peyrot M. Psychosocial care for people with diabetes: A position statement of the American diabetes association [Internet]. Vol. 39, Diabetes Care. American Diabetes Association Inc.; 2016 [cited 2020 Jul 30]. p. 2126–40. Available from: http://www.diabetesjournals

20. World Health Organization. Division of Health Promotion and Communication E. Health promotion glossary [Internet]. Geneva PP - Geneva: World Health Organization; 1998. Available from: https://apps.who.int/iris/handle/10665/64546

21. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. J Clin Epidemiol. 2009 Oct 1;62(10):1006–12.

22. Shamseer L, Moher D, Clarke M, Gherzi D, Liberati A, Petticrew M, et al. Preferred reporting items for systematic review and meta-analysis protocols (prisma-p) 2015: Elaboration and explanation. Vol. 350, BMJ (Online). BMJ Publishing Group; 2015.

23. McAllister M, Dunn G, Payne K, Davies L, Todd C. Patient empowerment: The need to consider it as a measurable patient-reported outcome for chronic conditions [Internet]. Vol. 12, BMC Health Services Research. BMC Health Serv Res; 2012 [cited 2020 Jul 30]. Available from: https://pubmed.ncbi.nlm.nih.gov/22694747/

24. Bravo P, Edwards A, Barr PJ, Scholl I, Elwyn G, McAllister M. Conceptualising patient empowerment: A mixed methods study. BMC Health Serv Res [Internet]. 2015 Jul 1 [cited 2020 Jul 30];15(1):252. Available from: http://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-015-0907-z

25. Eskildsen NB, Joergensen CR, Thomsen TG, Ross L, Dietz SM, Groenvold M, et al. Patient empowerment: a systematic review of questionnaires measuring empowerment in cancer patients [Internet]. Vol. 56, Acta Oncologica. Taylor and Francis Ltd; 2017 [cited 2020 May 28]. p. 156–65. Available from: https://www.tandfonline.com/doi/full/10.1080/0284186X.2016.1267402

26. Pekonen A, Eloranta S, Stolt M, Virolainen P, Leino-Kilpi H. Measuring patient empowerment — A systematic review. Vol. 103, Patient Education and Counseling. Elsevier Ireland Ltd; 2020. p. 777–87.

27. Checklist for Analytical Cross Sectional Studies Critical Appraisal Checklist for Analytical Cross Sectional Studies 2 [Internet]. 2017 [cited 2020 Sep 15]. Available from: http://joannabriggs.org/research/critical-appraisal-tools.htmlwww.joannabriggs.org

28. Higgins JPT, Altman DG, Gøtzsche PC, Jüni P, Moher D, Oxman AD, et al. The Cochrane Collaboration’s tool for assessing risk of bias in randomised trials. BMJ. 2011 Oct 29;343(7829).

29. DerSimonian R, Laird N. Meta-analysis in clinical trials. Control Clin Trials. 1986 Sep 1;7(3):177–88.

30. Deeks JJ, Altman DG, Bradburn MJ. Statistical Methods for Examining Heterogeneity and Combining Results from Several Studies in Meta-Analysis. In: Systematic Reviews in Health Care: Meta-Analysis in Context: Second Edition. Wiley Blackwell; 2008. p. 285–312.
31. Egger M, Smith GD, Schneider M, Minder C. Bias in meta-analysis detected by a simple, graphical test measures of funnel plot asymmetry. Bmj [Internet]. 1997 [cited 2020 Jun 12];315(7109):629–34. Available from: http://www.ncbi.nlm.nih.gov/pubmed/9310563%0Ahttp://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=PMC2127453

32. KAISER AB, ZHANG N, DER PLUIJM W VAN. Global Prevalence of Type 2 Diabetes over the Next Ten Years (2018-2028). Diabetes [Internet]. 2018 May 1 [cited 2020 Jul 29];67(Supplement 1):202-LB. Available from: https://diabetes.diabetesjournals.org/content/67/Supplement_1/202-LB

33. Salzburg Global Seminar. Salzburg statement on shared decision making. BMJ [Internet]. 2011 Mar 22 [cited 2020 Jul 30];342. Available from: https://www.bmj.com/content/342/bmj.d1745

34. Perestelo-Pérez L, Rivero-Santana A, Abt-Sacks A, Toledo-Chavarri A, Brito N, Álvarez-Pérez Y, et al. Patient empowerment and involvement in research. In: Advances in Experimental Medicine and Biology [Internet]. Springer New York LLC; 2017 [cited 2020 Jul 30]. p. 249–64. Available from: https://link.springer.com/chapter/10.1007/978-3-319-67144-4_15

35. Hernández-Jiménez S, García-Ulloa AC, Bello-Chavolla OY, Aguilar-Salinas CA, Kershenobich-Stalnikowitz D. Long-term effectiveness of a type 2 diabetes comprehensive care program. The CAIPaDi model. Diabetes Res Clin Pract. 2019 May 1;151:128–37.

36. Cheng L, Sit JWH, Choi K chow, Chair S ying, Li X, Wu Y, et al. The effects of an empowerment-based self-management intervention on empowerment level, psychological distress, and quality of life in patients with poorly controlled type 2 diabetes: A randomized controlled trial. Int J Nurs Stud. 2019 Sep 5;103407.

37. Baldoni NR, Aquino JA, Sanches-Giraud C, Di Lorenzo Oliveira C, de Figueiredo RC, Cardoso CS, et al. Collective empowerment strategies for patients with Diabetes Mellitus: A systematic review and meta-analysis [Internet]. Vol. 11, Primary Care Diabetes. Elsevier Ltd; 2017 [cited 2020 Jul 30]. p. 201–11. Available from: https://pubmed.ncbi.nlm.nih.gov/27780683/

38. Aquino JA, Baldoni NR, Flôr CR, Sanches C, Di Lorenzo Oliveira C, Alves GCS, et al. Effectiveness of individual strategies for the empowerment of patients with diabetes mellitus: A systematic review with meta-analysis. Vol. 12, Primary Care Diabetes. Elsevier Ltd; 2018. p. 97–110.

Tables

Table 1. Medline search strategy
| #  | Searches                                                                 | Results   |
|----|--------------------------------------------------------------------------|-----------|
| 1  | Diabetes Mellitus, Type 2/                                               | 132045    |
| 2  | (non insulin* depend* or noninsulin* depend* or noninsulin?depend* or non insulin? depend*).tw. | 12281     |
| 3  | ((typ? 2 or typ? II or typ?2 or typ?II) adj3 diabet*).tw.               | 144639    |
| 4  | (MODY or NIDDM or T2D*).tw.                                             | 38228     |
| 5  | (((late or adult* or matur* or slow or stabl*) adj3 onset) and diabet*).tw. | 4607      |
| 6  | 1 or 2 or 3 or 4 or 5                                                   | 194887    |
| 7  | exp Diabetes Insipidus/                                                 | 7854      |
| 8  | diabet* insipidus.tw.                                                  | 8499      |
| 9  | 7 or 8                                                                  | 10780     |
| 10 | 6 not 9                                                                 | 194779    |
| 11 | ((patient$ or adult$ or client$ or participant$ or individual$) adj3 empower$).tw. | 4981      |
| 12 | Self Efficacy/ or (self efficacy or self-efficacy).tw.                  | 35629     |
| 13 | patient activation.mp. or Patient Participation/                        | 26372     |
| 14 | Empowerment/                                                            | 179       |
| 15 | 11 or 12 or 13 or 14                                                   | 65516     |
| 16 | 6 and 15                                                                | 1579      |
| 17 | Anxiety/ or Anxiety Disorders/ or anxiety.tw.                          | 218044    |
| 18 | depression.mp. or Depression/ or Depressive disorders/ or depressive disorder*.mp. | 435656 |
| 19 | "Quality of Life"/ or quality of life.tw.                              | 335184    |
| 20 | 17 or 18 or 19                                                          | 848114    |
| 21 | 16 and 20                                                               | 359       |