Multifactorial Culture-Based Intervention on Improving Self-Management of T2DM Patient: A Systematic Review

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Abstract

Diabetes education is an important aspect of diabetes management. In many countries with minority population, culture-based diabetes education is considered the best strategy to correct gaps in information delivery due to socio-cultural differences in each country. The purpose of this systematic review is to evaluate the effectiveness of culture-based education in improving self-management in type 2 diabetes patient.

We searched Scopus, ScienceDirect, PubMed, CINAHL, and ProQuest for English-language, randomized controlled trials (RCTs), mixed-methods or quasi-experimental (QE) published between 2015-2020 that tested culture-based education to improve self-management in diabetes patients. The Joanna Briggs Institute Guideline was used to assess quality and Prisma checklist guided this review.

Seventeen studies met criteria for inclusion in the review that comprised DM patients with cultural beliefs, have culture-based intervention, and using English language, and which used mixed-methods, randomized controlled trial and a quasi-experiment. We have found that culture-based intervention such as educational video and telehealth based-culture can improve self-management of T2DM patients.

There is multifactorial culture-based intervention that can be applied to improve self-management of type 2 diabetes mellitus patient. The success of providing education can be influenced by several factors, such as patient factors, educator factors, and duration of education.

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Introduction

Diabetes self-management is an effort to prevent increased morbidity and mortality rates in DM patients. In several countries with ethnic minorities, cultural differences in the form of linguistics and physiology affect the ability of DM patients to adapt and manage disease [1]. The American Diabetes Association (ADA) recommends diabetes management education as an effort to increase the knowledge and ability of DM patients in managing disease. Diabetes management education that uses a cultural approach is considered the best strategy to correct gaps in information delivery due to socio-cultural differences in each country [2]. The incidence of DM continues to increase every year; in 2019, around 463 million adults (aged 20-79 years) experienced diabetes worldwide, and in 2045 the figure is expected to increase to 700 million [3]. Therefore, DM management must be done optimally to prevent a further increase in DM cases. In fact, the implementation of self-management in DM patients is not entirely good, only about 46% of the patient's behavior is categorized as having good self-management [4]. The average self-management score was 48.4% with a score of 0-112 (moderate category), consisting of diet, physical activity, medication, blood glucose control, and foot care [5].

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Diabetes Self-Management Education (DSME) is an important element in the care of people with diabetes. DSME is an ongoing process to facilitate the knowledge, skills and abilities needed for self-management of diabetes patients, and is a series of activities that help DM patients implement and maintain the behaviors needed to manage their condition in a sustainable manner [6]. Based on the DSME, self-management in DM patients consists of four main pillars, namely management of a healthy diet, physical activity, blood sugar management and foot care [6]. Several systematic reviews that have been done previously only focused on discussing the effectiveness of DSME in general, but there are no studies that discuss the effectiveness of culture-based intervention on self-management of DM patients. Therefore, this systematic review aimed to explain multifactorial culture-based intervention on improving self-management of T2DM patients.

Materials and methods

Information Sources and Search Strategy

The literature search was carried out in November 2020-January 2021. The data used in this study were secondary data obtained from the results of research conducted by previous researchers and not from direct observation. The secondary data sources obtained were journal articles with national and international reputation with predetermined themes. The literature searched in this systematic review used five databases with high and medium quality criteria, namely Scopus, ProQuest, PubMed, CINAHL and ScienceDirect. Keyword searches were adjusted to guidelines on Medical Subject Headings (MeSH). The series of keywords used are Diabetes mellitus OR hyperinsulinemia OR Type 2 diabetes mellitus OR hyperglycemia AND Diabetes Self-Management Education OR DSME OR Diabetes Self-Management Support OR DSMS AND benefit OR effectiveness OR results AND Self-Management Education OR Self-Management Support OR education OR intervention OR program AND culture OR transcultural OR cultural.

Study Eligibility and Selection Criteria

In this section, reviewers select the articles that have been obtained based on predetermined keywords. Previously, reviewers made the PICOS format as an indicator for the assessment of the suitability of the article (Table 1).

Criteria	Inclusion	Exclusion
Population	Studies comprised DM patient with cultural beliefs	DM patient without cultural beliefs
Intervention	Cultural intervention and cultural beliefs	Non-cultural intervention and cultural beliefs
Comparison	No comparator	-
Outcome	The impact of cultural in diabetes management	Not describe the impact of cultural in diabetes management
Study design & publication type	Quasi-experimental studies, randomized control and trial, qualitative research and cross-sectional studies	Literature review, systematic review, narrative review
Publication year	Post 2014	Pre 2014
Language	English	Language other than English

Table 1. PICOS Criteria.

Based on the results of the literature search, 234 articles that matched keywords with article details were obtained from the Scopus database (n = 36), ProQuest (n = 76), ScienceDirect (n = 42), PubMed (n = 42), and CINAHL (n = 38). From a total of 234 articles found, article duplication checks were then carried out and 47 of the same articles were found so that they were excluded from the search results and 187 articles were left. Reviewers then conducted screening based on title (n = 187), abstract (n = 68) and full text (n = 17) adjusted to the theme. Based on the eligibility screening carried out against the inclusion and exclusion criteria, 17 articles were found that could be used in this review. The results of the study article selection can be illustrated in the PRISMA Figure 1 below:
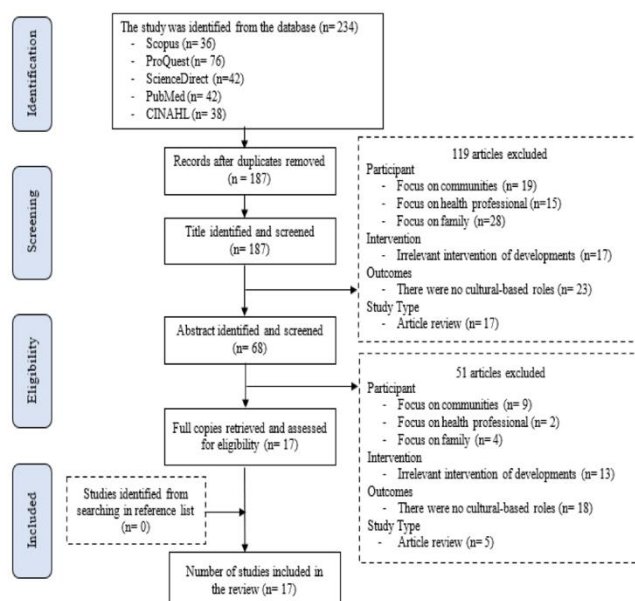

Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA).

Results

Respondent Characteristic

Respondents in this study were DM patient in each country. In this study the total respondents were 3,113 DM patients. The gender characteristics of the respondents were not a limitation, on average in each study the number of male patients was greater than female. Participants in the study had been randomly selected based on inclusion and exclusion criteria. The age limit is not explained, but the majority of study respondents are DM patients in the adult age category.

Study Characteristic

The final result of the search for journals obtained 17 articles that matched the predetermined inclusion criteria. Based on the research design, the researcher included all the research designs except the design of the review articles, such as literature reviews, systematic reviews, and narrative reviews. The research design that was obtained the most was the randomized controlled test (RCT) with five articles [7–11]. Furthermore, there were four articles that fell into the quasi-experimental category [12–14], and four articles included in the true experiment category [15–18], the reviewer also included two articles using qualitative research design [19,20]. The remaining two articles obtained from the search and screening results have a pilot study [21] and mixed-methods design [22]

Based on the study characteristics of the 17 articles used, it is known that the majority of studies only included DM patients in the implementation of the intervention, namely 15 articles [2,7,16,17,20–22,8–15], and only two studies used DM patient subjects and their families in implementing the intervention [18,19]. The place where the research was carried out from the 17 articles that were included was also scattered in various countries in the world. The United States of America (USA) had the greatest number of countries, namely four articles [9,13,15,22], then on the Asian continent, Malaysia had three articles [10,11,16], and Indonesia two articles [12,21]. Two other studies were carried out in Mexico [8,18], while the countries of Morocco, Qatar, Spain, and the United Kingdom each had one article [2,7,14,19,20], and there was one article that did not list the country of implementation research [17].

Type of Intervention

Diabetes intervention, which is the main theme in writing this systematic review, is conveyed through various types of media and methods, both electronic and printed. There are six studies using the focus group discussion (FGD) method [9,13,14,17–19]. The intervention in the FGD was accompanied by educational material delivered through PowerPoints and / or leaflets. In addition to being delivered in the form of discussion, two studies stated that intervention in DM patients was delivered through lectures or lecture methods [11,20]. Three studies used audiovisual media in the form of educational videos combined with the use of regional languages, or making a film in several series of stories modified and adapted to the diabetes material to be delivered [8,21,22]. Three other studies used educational media in the form of material modules that were printed as attractive as possible into a book [2,7,16]; these modules can be brought when DM patients exercise control at the nearest health facility. Another method used in giving DM intervention is through workshop [15], talk-show [10], and coaching program [12].

Length of Intervention

The implementation of diabetes intervention in each study had a different procedure. Apart from the media and methods used, the duration of the intervention was also different. Of the 17 articles included in this study, six articles stated that the intervention was given only once [2,14,16,17,20,21], with varying duration of implementation, four articles provided an intervention with a long duration of time, namely 12 weeks [8,10,12,18]. Another duration of giving DM intervention was two weeks [15], four weeks [7], five 5 weeks [15], six weeks [13] and eight weeks [9,19]. One article stated that the duration of DM intervention was carried out for six months to make it more optimal [11].

Outcome of Intervention

The main outcome, which is the target of diabetes intervention, is increased knowledge about Diabetes Mellitus [2,16,17,21] and the patient is able to carry out self-management optimally [13,14,18–20]. Another expected outcome is the achievement of normal values from the results of body biochemical measurements such as BMI, blood pressure, HbA1C, lipid profile, albumin and creatinine [9,11,15]. Several studies have targeted the combined outcome of the interventions undertaken, such as increasing knowledge and normal blood biochemical values[7], implementing effective self-management, and optimizing the

body's biochemical values [8,12]. Two other studies targeted the results obtained in the form of increased self-efficacy and patient wellbeing [10,22].

Quality Assessment

Assessment of the quality of journals used observation sheets from The Joanna Briggs Institute Critical Appraisal (JBI). Based on the results of the assessment, it was found that 16 articles had a low risk of bias[2,7,16,18–22,8–15], and only one article was categorized as a high risk of bias[17] because the number of samples in the study was very large, namely 1008 respondents, also, the intervention used was in the form of an online discussion to respondents from various countries so that it can influence the final measurement results of the interventions that have been given.

Discussion

The results of the review conducted obtained several important findings related to the implementation of DM interventions in several studies. In a study that provided only one intervention, the expected outcome would focus more on increasing DM patient knowledge about diabetes disease and treatment[2,14,16,17,20,21].

Providing educational interventions in one session is usually targeted at newly diagnosed DM patients [17], so that they can increase their knowledge and be able to carry out DM management as early as possible. Meanwhile, interventions carried out over a longer period of time target the outcome at increasing the ability of patients and or their families to manage DM well. Based on the guidelines for the implementation of Diabetes Self-Management Education (DSME) made by the IDF, it is known that the provision of interventions within a span of 6-8 weeks is the optimal time to improve the patient's ability to manage [6,23]. In addition, to be able to change compliance with management behavior in DM patients, a sustainable and interesting intervention is needed [24,25]. Therefore, several studies have made various innovations in the form of media and methods in delivering diabetes education[8,10,16,21,22].

The main purpose of writing this review is to provide an explanation regarding some culture-based diabetes interventions in their effectiveness in improving self-management in DM patients. Based on the results of the review, the use of a "cultural" basis is defined as the application of an intervention based on the habits and characteristics of the patient, who is the research respondent[2,7,9,11,13,14,18,19]. Some of the studies included in this review limited the population only to DM patients with a certain race or ethnicity to avoid bias in the results of the intervention [8,9,19]. Differences in ethnicity and other demographic characteristics can affect respondents' understanding and ability to receive information. Other research defines "culture" as something related to the lifestyle that develops in the community, which is associated with everyday language, art performances that are used as a medium for entertainment and recreation in the local community [8,10,16,20–22]. So that the type of intervention used is adjusted to the local language or by utilizing regional arts that are preferred by the community.

The notion of "culture" in other studies is related to eating habits or restrictions and recommendations that must be done by someone suffering from certain diseases[11,12,17]. Based on the transcultural nursing model, there are three basic principles in culture-based nursing care[26]. The first is culture care preservation/maintenance, namely the principle of helping, facilitating and paying attention to existing cultural phenomena in order to help individuals determine the level of health and the desired lifestyle. Second, culture care accommodation/negotiation, which is the principle of helping to facilitate and pay attention to cultural phenomena that reflect ways to adapt, or negotiate or consider individual health conditions and lifestyles. The last principle is culture care repatterning/restructuring, which is the principle of changing/reconstructing to help clients improve their health conditions and lifestyle for a better direction [27]. Thus, cultural interventions carried out in DM patients must be adjusted to the results of the assessment of cultural values adopted and then applied based on three basic principles in transcultural nursing.

Conclusions

In conclusion, this systematic review provides information about culture-based intervention to improve self-management in Type 2 DM patients. Providing optimal intervention can be based on three things, the most important is the outcome that you want to get from the intervention, whether it is just an increase in

knowledge or a change in compliance behavior in DM management. The second important thing is the type of intervention that will be provided, including the media and methods used, and the last is the duration of the intervention; this can be adjusted according to the outcome to be achieved. The implementation of interventions that are tailored to the cultural values adopted by the patient will make it easier for patients to receive information, carry out interventions and increase their ability and independence in treatment.

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Declaration of Interest

The authors declared that did not have potential conflicts of interest concerning the research, authorship, and/or publication of this research reported.

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