Research Article

Self-Management Mentoring Model in Improving the Health Quality of Life of Productive Age Diabetics

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Abstract.
Diabetes is a global epidemic, and failure to address it directly and effectively can lead to economic losses affecting countries in Asia and Africa. This systematic review was compiled to find a comprehensive self-management mentoring model by community health workers that have an impact on improving the quality of life. The search strategy for articles and data sources encompassed various electronic databases, including PubMed, Health evidence, Cochrane, Google Scholar, Web of Science, Publish and Perish. The search strategy utilized PICOT key ((((diabetes mellitus[Title/Abstract] OR diabetes management by peers [Title/Abstract])) AND (control[Title/Abstract] OR no[Title/Abstract])) AND (HQOL[Title/Abstract] OR QOL[Title/Abstract] OR HBA1C[Title/Abstract] OR blood pressure[Title/Abstract] OR Body mass index[Title/Abstract])) AND (week[Title/Abstract] OR month[Title/Abstract]) . Based on the searching results obtained 277 articles found, following screening, extraction, and Full-text review, 10 articles were synthesized, various models of self-management were obtained with peer assistance and community health workers, such as PBE, IBE, PBS, HE, HC, Model 5 healthy lifestyle, self-management with CHW mentoring for 3 months. COMP-DSMP Model for 3 months. Diabetes Online Model for diet & e-health for diabetics, "Blue Star Mobile Apps" Model, DSME DMT2 Model. The success of self-management is highly dependent on the amount of motivation of diabetes mellitus (DM) patients to improve their knowledge, attitudes, and practices in controlling and managing blood glucose control. Compliance with therapy, physical activity, control of sugar consumption, dietary management, stress management, and regulation of rest patterns are the keys to optimal quality of life for people with diabetes mellitus.

Keywords: community health worker, health quality of life, self-management mentoring

1. INTRODUCTION

Based on the International Diabetes Federation, the prevalence of Diabetes Mellitus in the last decade has increased sharply. Diabetes is a disease with the highest prevalence and the most suffered by the population in the world. A total of 422 million people with diabetes mellitus aged over 18 years or 8.5% of the total world population. Diabetes is a global epidemic problem which if not handled directly and adequately will result

in economic losses that have an impact on Asian-African countries. Data from the IDF (International Diabetes Federation) shows that the cost of treating diabetes reaches USD 727 billion per year, or can be said to reach 12% of global health financing. [1] . IDF data shows that in 2017, an increasing trend of people with diabetes mellitus of productive age still occurred. Indonesia is ranked 6th after China, India, the United States, Brazil, and Mexico. Baseline Health Research Data shows that within five years the prevalence of diabetes mellitus in Indonesia increased sharply from 6.9% in 2013 to 8.5% in 2018, so it can be estimated that the total number of people with diabetes in Indonesia reached more than 16 million people who are likely to progress to other metabolic diseases related to cardiovascular, kidney failure, blindness, stroke, paralysis and even death.

Diabetes is one of the non-communicable diseases with a continuation of chronic and requires efforts long-term care are not only related to compliance with medical therapy alone but rather on efforts patient independently manages the health status independently include self-care, setting intake, compliance with therapy, and activity regular physical and measurable, given the increasing number of people are in the productive age, which is > 15 years. Whereas, health management independently diabetics are known as self-management. According to Aponte J.Jackson (2017) [2], which is quoted in Werfalli, Mahmoud (2020), evaluation of diabetes self-management program shows the results can improve outcomes (which include the level of quality of life for people with diabetes, including physical, functional, social and psychological) while reducing the use of health services [3]. As for self-management itself consists of two aspects: the SME (self-management education) and SMS (self-management support). SME is a set of procedures to facilitate the knowledge, skills, and abilities to perform self-management of diabetes. While SMS is a series of activities to provide support (in the form of behavioral, educational, psychosocial, and clinical) to people with diabetes with the aim of patients able to implement and continuously adopt preventive behaviors complications and apply themselves better management.

Diabetes Mellitus, both Type 1 and Type 2, is a chronic non-communicable disease (chronic), progressive, and can progress to complications of organ damage. Diabetes Mellitus requires a high level of adherence to lifestyle settings related to diet, physical activity, stress management, and rest patterns to maintain the quality of life of people with Diabetes Mellitus in addition to managing blood glucose through medication interventions.

Self-management interventions can be accompanied by family, peers, as well as by health workers, even by community health workers who of course adapt to the context

of the situation and condition of people with diabetes mellitus. [4] Assistance in self-management efforts will have an impact on increasing patient compliance with lifestyle settings related to diet, physical activity, stress management, and rest patterns.

Various models of self-management in people with diabetes mellitus that involve mentoring peers and family are widely carried out, but reviews of self-management of people with diabetes mellitus of productive age to improve quality of life with community health worker assistance are relatively few in number, so a systematic study is needed relatedto self-management models. People with diabetes mellitus of productive age with assistance from community health workers to improve the quality of life-related to the physical, psychological, functional, and social dimensions.

2. METHOD

Presentation of the study design refers to the systematic review PRISMA-P [5] which includes the systematic review writing [6]. The method of research on systematic review was conducted by the methodology JBI for a systematic review of the effectiveness or influence [7] , but it also refers to several systematicarticles review which have a topic that is relevant, such as the effectiveness of non-pharmacological strategies in the management of type 2 diabetes in care primary: protocol for a systematic review and meta-network. [8] This study uses 8 steps according to the instructions of making systematic reviews [9]. The steps include:

A. Inclusion And Exclusion Criteria

Inclusion criteria explain the determination and limitation of research topics that include several things related to "PICOT" participants, interventions, comparisons, outcomes, and theories. The following is the determination of the inclusion criteria for articles that can be reviewed, including:

1. Articles in English and Indonesian with RCT design.

2. Articles are in the 2015-2020 range.

B. Participants

Adult patients, over 18 years of age, diagnosed with T2DM according to the American Diabetes Association [10] (fasting glucose greater than or equal to 126mg/dL, glycemia greater than 200mg/dL associated with classic DM symptoms, 2-hour fasting glycemia with 75 g glucose greater than or equal to 200mg/dL, HbA1c greater than or equal to 6.5%) will be included in the study. The research subjects were diabetes mellitus patients of productive age >18 years with type 1 who would be considered as participants.

C. Intervention

The Articles selected is contains all the interventions provided to patients with diabetes mellitus which includes self-management, as well as some of the interventions related to diet, nutrition (setting energy intake, carbohydrate) [11], setting physical activity (walking, running, swimming, cycling, gymnastics) [12]. Psychological intervention that focuses on emotion and cognition, social intervention with the assistance of friends, family, and peers [3]. As well as other intervention modality that combines physical activity, diet, social and psychological support. Intervention and SME & SMS (self-management and self-management support Educations).

D. Comparator (Control)

The selected articles are those that contain a comparison group, namely a group that takes diabetes classes with a program that has been determined and is assisted by professional health workers, both midwives, as well as nurses or other health workers.

E. Intervention results

The selected articles are articles that have the main results in the form of a glycemic index value of HbA1C<7, as well as additional results in the form of measurements of body weight, body mass index, satisfaction, and quality of life. In addition, the results of the study are the aggregate value of quality of life which includes (physical dimensions include sugar levels, blood pressure, therapy), psychological (self-efficacy, knowledge of diabetes), functional (self-management education & self-management support), social (per a social, work, family).

F. Exclusion criteria

Articles containing participants with gestational diabetes, secondary diabetes due to chronic disease treatment, interventions in the form of surgery for weight loss programs, as well as pharmacological clinical trials, and results that are not correlated with quality of life will be excluded from the review.The duration of the intervention is at least 3 months.

3. ARTICLE SEARCH METHOD

The article search strategy and data sources were obtained from various electronic health databases, such as PubMed, Health evidence, Cochrane (Cochrane Central Register of Controlled Trials), Google Scholar, Web of Science, Publish and Perish. Search strategy using PubMed from Medline with PubMed Advanced search builder using keywords PICOT (problem, intervention, control, outcome and time) ((((diabetes mellitus[Title/Abstract] OR diabetes in adults [Title/Abstract]) AND (self-management by community health worker[Title/Abstract] OR diabetes management by peers [Title/Abstract]))

AND (control[Title/Abstract] OR no[Title/Abstract])) AND (HQOL[Title/Abstract] OR QOL [Title/Abstract] OR HBA1C[Title/Abstract] OR blood pressure[Title/Abstract] OR Body mass index[Title/Abstract])) AND (week[Title/Abstract] OR month[Title/Abstract]) .

TABLE 1: Searching Strategy

Category Searching parameters. P (Problem)	" Diabetics in adult " OR " diabetes mellitus "
I (Intervention)	"Self-management by community health worker" OR "diabetes management by peer"
C (Control)	"Control" OR "No"
O (Outcome)	" HQOL " OR " QOL " OR " HBA1C " OR " weight " OR " BMI " OR " blood pressure" OR "psychological indicator "
T (Time)	" Week " OR " month "

3.1. Select a Relevant Study

Selection of relevant studies carried out by two independent reviewers, using some guidelines CA (Critical Appraisal) issued by JBI [13] using the CA to research the type of RCT. [14] The selection of articles is done first by filtering the abstract, then the selected abstracts will be reviewed full text using the CA has been established, if there are disagreements between reviewers, then conducted discussions to establish a decision.

3.2. Data Extraction

This process is done by creating a simple table contains data from articles that have been as follows: author, year of publication, title, country, dependent variable, databases, and the exclusion criteria. To this is added also information that summarizes the number of patients included, the duration of follow-up, information on inclusion and exclusion criteria, type of intervention (frequency, description, duration), baseline (median age, sex, weight, priorglycemic control)before the study.

3.3. Assessment of the Quality of the Selected Research

One of the efforts in selecting the study is to determine the quality of the research are obtained. As well as controlling the possibility of bias that occurs in the research process, whether it is multiple subject bias, used bias, recording bias, reporting bias, bias in scoring, extractor bias, inclusion criteria bias & selector bias, as well as publications bias. [15] We used the Cochrane risk bias tool guidelines for a randomized trial (RoB 2 tool) that considered the following five domains for each outcome evaluated: (1) bias

arising from the randomization process, (2) bias due to deviations from the intended intervention, (3) bias due to missing results data, (4) bias in outcome measurement and (5) bias in the selection of reported outcomes. [16] .

The following is a flowchart of article search and selection of research studies to be reviewed:
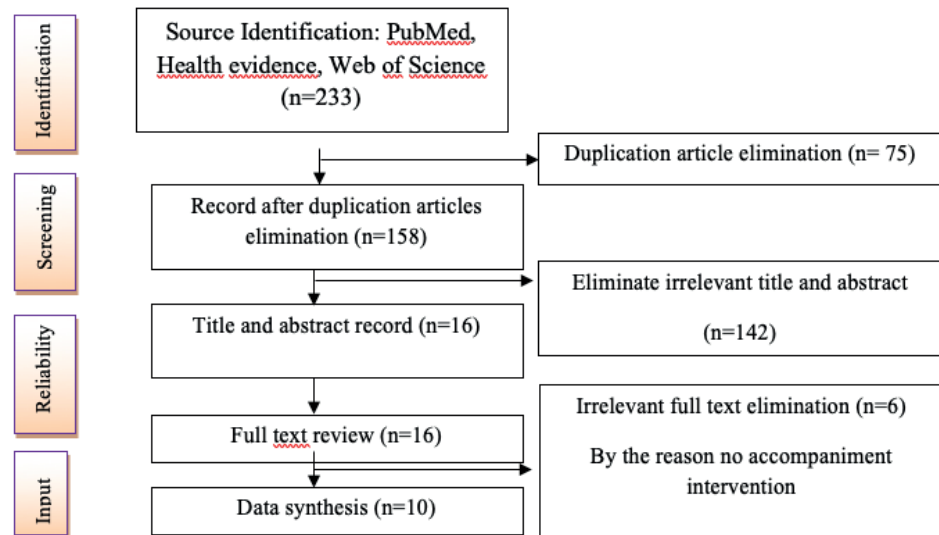

Figure 1: Flowchart of Article Search and Study Selection Refers to PRISMA-P.

4. RESULTS AND DISCUSSION

4.1. Results

Based onthe full-text review result of 16 articles, then the election of articles back and pull out the full text of which is not by the purpose of review, bringing the total number of articles which are synthesized is 10 articles, from the United States, Canada, and the Netherlands. The articles foundby having manual search in PubMed from MEDLINE number 5 article, obtained from the search articles in PubMed search advance number of 3 articles and obtained a search arcticel in health evidence several first articles and obtained a search articles in Cochrane

number 1 article, it was concluded that there various models of self-management in patients with diabetes mellitus productive age with the assistance of community health worker or peer, the intervention model is given to people with diabetes both type 1 and type 2, with the timing of the intervention ranged from 1 to 3 months, with the intervention model in the form of physical intervention, psychological, and motivation in various forms models of mentoring.

From 10 articles obtained in the search PubMed manual obtained various models of self-management such as TBE (Telephone base Educations), IBE (internet base of Educations), PBS (Peer Base Support), mindfulness, Peer-Delivered cognitive Behavioural Training, Community-based peer and community health worker-led diabetes self-management programs (COMP-DSMP) , diabetes attitudes, Models Wishes and Needs (DAWN), Online interventions, interventions Mobile app, Psychological interventions for diabetes-related distress in adults. [17] [18] [19] [20] [2] [3] [21] [22]

The model of self-management that can be synthesized from 10 article is average given to people with diabetes by co-peer and community health workers in the form of intervention glucose control blood, physical activity, as well as the intervention of motivation to perform p Behaviours clean and healthy life with 5 lifestyle management healthy (healthy eating, physical activity, stress management, communication and consultation with health workers, and development of social support).Thesevarious self-management models influence clinical and psychological outcomes.

Self-management interventions provided by peer assistance and community health workers, in all reviewed articles, provided significant improvements in blood glucose control, decreased HBA1C, decreased blood pressure, waist circumference, body weight, body mass index, and cholesterol levels. The result of the synthesis of 1 0 articles selected are presented in the following table:

TABLE 2: Data Extraction.

Study Design and Findings Principal researcher	Year	Country	Participants	Interventions /self-management models	Control	Outcome	Findings
Njeru, et all [17]	2017	United States of America	DM patients with limited English proficiency	Diabetes case management, diabetes education, telephone base education, internet based educations, peer base support.	DM patients with non non-LEP	HBA1C, blood pressure, self-efficacy, quality of life, and blood glucose control	The self-management model has been shown to significantly reduce HBA1C, blood pressure, and low-density lipoprotein cholesterol and increase knowledge, self-efficacy in DM patients, and quality of life.
Wayne, et al [18]	2015	Canada	DM patients from two primary health services in Toronto, Canada	Self-management with education assistance and health training for 6 months via telephone base educations	DM patients who get a natural management model	HBA1C, weight, waist circumference, body mass index, life satisfaction, depression and anxiety, positive and negative affect (Positive and Negative Affect Schedule [PANAS], and quality of life	There were significant differences in HBA1C outcomes, body weight, waist circumference, BMI, and psychosomatic indicators in 138 respondents in the intervention and control groups.

TABLE 2: Continued.

Study Design and FindingsPrincipal researcher	Year	Country	Participants	Interventions /self-management models	Control	Outcome	Findings
Andreae, et all [20]	2020	United States of America	195 Patient DM type 2 productive age	Self-management with 10 weeks of healthy living training, focusing on 5 healthy lifestyle management (healthy eating, physical activity, stress management, communication and consultation with health workers and social support)	DM patients with general health program	WOMAC, HQOL, SBP, BMI	Self-management with 5 healthy lifestyles is proven to affect WOMAC, HQOL, SBP, and DMI
Aponte, et all [2]	2017	United States of America	60 Hispanic teens	Self-management of people with diabetes mellitus with community health worker assistance for 5 months	Non-Hispanics adult DM patients with natural self-management without community health worker assistance	HBA1C, systolic blood pressure, diastolic blood pressure, body weight, and triglycerides.	Self-management of DM patients with community health worker assistance has been shown to significantly reduce HBA1C, systolic blood pressure, diastolic blood pressure, Triglycerides, and body weight in the intervention group.
Werfalli, et al [3]	2020	United States of America	Diabetes mellitus patients of childbearing age in middle-income countries	COMP-DSMP (Community health worker-led self-management support program) for 3 months	Patients with diabetes mellitus with usual care	Self-efficacy, knowledge, health behavior, quality of life, self-confidence, self-esteem, HbA1C, cholesterol, glucose 2 hours PP	COMP-DSMP was shown to significantly increase self-efficacy, knowledge, health behavior, quality of life, self-confidence, self-esteem, and reduce HbA1C, cholesterol, glucose 2 hours PP in the intervention group.
Hanna, et all [23]	2014	United States of America	184; respondents with type 1 Diabetes Mellitus graduated from high school	Diabetes management with physical activity, diet, and support system	Without control	Glycemic control, DQOL (Diabetes Quality of Live)	With good self-management in people with type 1 diabetes mellitus, high school graduates will help maintain the quality of DQOL (Diabetes quality of life), and glycemic control.
Saslow, et al [24]	2017	Canada	Type 2 Diabetes Mellitus Patients with BMI>25	Diabetes online self-management model for diet, e-health	Diabetes Mellitus patients with usual care	HbA1C, body weight, Body Mass Index, psychological indicator	Diabetes online self-management model for a diet with an example of the portion of my plate was proven to significantly reduce HbA1C, body weight, BMI.

Table 2: Continued.

| Study Design and Findings Principal researcher	Year	Country	Participants	Interventions /self-management models	Control	Outcome	Findings
Agarwal, et al [25]	2019	Canada	110 Patients with Diabetes Mellitus of productive age with HbA1C > 8	Internet-based intervention model "BlueStar Mobile Apps" specially designed for type 2 DM intervention	113 Diabetes Mellitus patients with usual care	HbA1C, HQOL	There was no significant difference in HbA1C for 3 months between the intervention group and the control group with the intervention, but there was a tendency to increase HQOL in the intervention group.
Chew et all [26]	2017	Dutch	Type 2 DM patient	Application of psychologycal intervention model for DMT2, self-management	No control	HbA1C, QOL	psychologycal intervention model for T2DM, self-management can improve HbA1C control and quality of life in productive age T2DM patients.
Cunningham et al [26]	2018	United States of America	African-American Type 2 Diabetes Mellitus Patients	DSME (Diabetes Self-Management) for DMT2. patients	DM patients with usual care	HbA1C, quality of life	The DSME model can lower HbA1C and improve quality of life

5. Discussion

Self-management in people with Diabetes Mellitus in various articles shows that it can help people with Diabetes Mellitus to control blood glucose and adopt a healthy lifestyle. As in a study conducted by Andreae [20], who researched the effectiveness of self-management by implementing 5 healthy lifestyles (healthy eating, physical activity, stress management, communication, and consultation with health workers and social support) in patients with type 2 diabetes mellitus. for 3 months, a significant influence on the WOMAC (Western Ontario and Mc Caster Universities Osteoarthritis Index), related Health Quality of Live (HQOL), HbA1c, systolic blood pressure, and body mass index.

Andreae's research is in line with Njeru et all [17], who conducted research on type 2 DM patients by providing diabetes case management, diabetes education, telephone base education, internet based educations, peer base support, where the self-management model in Njeru et all's research was proven significantly reduced HBA1C, blood pressure, and low-density lipoprotein cholesterol and increased knowledge, self-efficacy in DM patients, and quality of life. Based on the synthesis of the article, various

models of self-management for patients with diabetes mellitus, both type 1 and type 2 diabetes were obtained.

Self-management models in people with diabetes mellitus have wide variations, ranging from self-management models for physical management such as physical activity, balanced diet, blood glucose control, to monitor systolic blood pressure and diastolic blood pressure. As well as self-management models related to improving psychological aspects such as providing health education both face-to-face and online (internet based educations, online base educations, phone base educations). Various research models of self-management models in patients with diabetes mellitus can be described as follows:
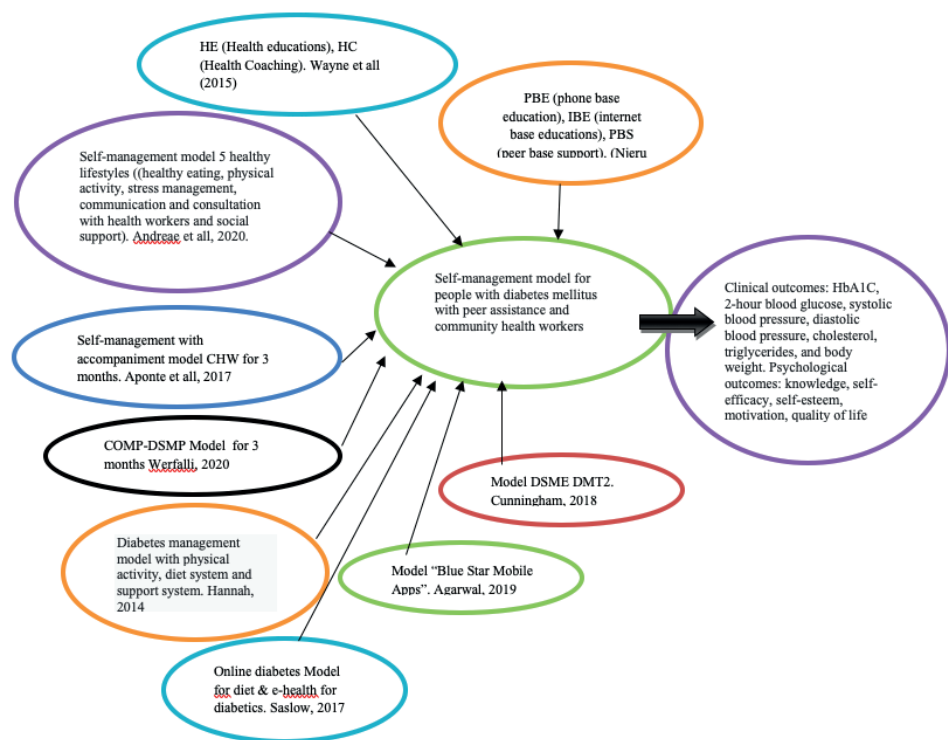
Figure 2: Self-Management Model for Diabetes Mellitus Patients.

The ideal self-management model is carried out by people with Diabetes Mellitus independently,however, through peer assistance and community health workers, self-management of people with diabetes mellitus is more effective and in several synthesized research articles it provides evidence that it is quite effective in reducing several clinical outcomes. , such as: HbA1C, glucose index, systolic blood pressure, diastolic blood pressure, cholesterol, triglycerides, body weight, WOMAC, and body mass index. In addition, self-management of people with diabetes mellitus with the assistance of community health workers and peers also has a significant effect on increasing knowledge, self-efficacy, self-esteem, and quality of life-related to health.

This systematic review found various models of self-management of DM patients with peer assistance and community health workers. However, several things need to be considered in assisting self-management of people with diabetes mellitus, including the success of self-management is highly dependent on the motivation of DM patients to improve their knowledge,

Attitudes, and practice in controlling and managing blood glucose control. The role of peers and community health workers is very much needed in motivating DM sufferers to practice all health advice given by their companions. Therapy adherence, regular and measurable physical activity, control of sugar consumption, low glucose diet, stress management, and quality rest patterns are the keys to optimal health-related quality of life in people with diabetes mellitus.

6. CONCLUSION

Various models of self-management by people with diabetes mellitus were developed with the assistance of peers and community health workers which correlated significantly with various clinical and non-clinical outcomes, such as blood glucose levels, HbA1C, systolic blood pressure, diastolic blood pressure, body mass index, and body weight. Therefore, non-clinical outcomes such as knowledge, self-efficacy, self-esteem, motivation, and quality of life, with various obstacles, such as the level of compliance, drop out during intervention, or other obstacles. Therapy adherence, regular and measurable physical activity, control of sugar consumption, low glucose diet, stress management, and quality rest patterns are the keys to optimal health-related quality of life in patients with diabetes mellitus.

Miscellaneous studies that correlate the self-management of people with diabetes mellitus with clinical and non-clinical outcomes have been carried out, but those that specifically link the model of self-management of people with diabetes mellitus with mentoring community health workers with improving the quality of life in the health sector (Health Quality of Life/HQOL) which is measured from four physical dimensions: blood glucose levels, blood pressure, psychological dimensions such as self-efficacy, self-confidence and also functional dimensions: capacity functions, performance functions, capacity utilization functions, reserve functions, then social dimensions: social roles and the role of the family has not been explored much. So it is necessary to conduct empirical research related to this study.

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