



## Effects of Health Coaching on Self-Care and HbA1C in Type 2 Diabetes Mellitus: A Literature Review

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### ABSTRACT

Health coaching is one approach to change the behavior of patients who have type 2 diabetes mellitus problems. Behavior change can increase HbA1C and have a positive impact on the management of T2DM. This paper aims to determine the effect of *health coaching* on *self-care* and HbA1C in type 2 diabetes mellitus. This study uses a systematic review method on three databases: *PubMed*, *ProQuest*, *ScienceDirect*. Articles were selected according to predetermined criteria, namely the time of publication in 2015–2021, had full text, in English with the keywords *Health Coaching* OR *Mentoring* AND *Self-Care* AND HbA1C AND Diabetes Mellitus. The results of the article search obtained a total of 295 articles which were then reviewed using the PRISMA systematic flow diagram, so that the final results were 5 articles that met the requirements for analysis. The analysis of this article review uses JBI's critical appraisal. Results Five articles that deserve to be analyzed, that is 4 articles which state that *health coaching* can be an effective and efficient program for changing self-management behavior by doing physical activity and monitoring blood sugar. And 1 article states that with the help of *health coaching* patients can determine health goals and carry out a healthy lifestyle. *Health coaching* can be an effective and flexible program for behavior change and can be implemented through clinical and community regulations.

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### Kata kunci:

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### ABSTRAK

*Health coaching* merupakan salah satu pendekatan untuk mengubah perilaku pasien yang memiliki masalah diabetes mellitus tipe 2. Perubahan perilaku dapat meningkatkan HbA1C dan memiliki dampak positif dalam manajemen DMT2. Makalah ini bertujuan untuk mengetahui pengaruh *health coaching* terhadap *self-care* dan HbA1C pada diabetes mellitus tipe 2. Penelitian ini menggunakan metode tinjauan sistematis pada tiga database: *PubMed*, *ProQuest*, *ScienceDirect*. Artikel dipilih sesuai dengan kriteria yang telah ditetapkan yaitu waktu publikasi tahun 2015–2021, memiliki teks lengkap, berbahasa Inggris dengan kata kunci *Health Coaching* OR *Mentoring* AND *Self-Care* AND HbA1C AND Diabetes Mellitus. Hasil penelusuran artikel didapatkan total 295 artikel yang kemudian dilakukan review menggunakan alur sistematis diagram PRISMA, sehingga didapatkan hasil akhir 5 artikel yang memenuhi syarat untuk di analisis. Analisis review artikel ini menggunakan *critical appraisal* JBI. Hasil lima artikel yang layak di analisis yaitu 4 artikel yang menyatakan bahwa *health coaching* dapat menjadi program yang efektif dan efisien terhadap perubahan perilaku manajemen diri dengan melakukan aktivitas fisik dan pemantauan gula darah. Dan 1 artikel menyatakan bahwa dengan bantuan *health coaching* pasien dapat menentukan tujuan kesehatan serta melakukan gaya hidup sehat. *Health coaching* dapat menjadi program yang efektif dan fleksibel untuk mengubah perilaku dan dapat diimplementasikan melalui peraturan klinis maupun komunitas.

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## INTRODUCTION

Diabetes mellitus is a metabolic disease characterized by an increase in chronic blood sugar levels or chronic disease that causes many deaths worldwide (Punthakee, Goldenberg and Katz, 2018). According to data from the IDF International Diabetes Federation (2019) which explains that diabetes mellitus is not only a health crisis but has become one of the largest global health emergencies in the 21st century. In 2017 there were 425 million people aged 20-79 years who had diabetes worldwide, and it is estimated to continue to increase by 51% until 2045 and is estimated to reach 629 million people (Irnawan, 2021). Diabetes mellitus has risk factors that can be grouped into two, namely risk factors that can be modified and cannot be modified. Risk factors that cannot be modified are race and ethnicity, age, gender, family history of diabetes, history of childbirth with low weight (< 2500 grams). While modifiable risk factors are closely related to less healthy living behaviors such as obesity, lack of physical activity, hypertension, dyslipidemia, unhealthy diet, a history of impaired glucose tolerance or disturbed fasting blood sugar and smoking (Gu *et al.*, 2017).

Diabetes mellitus if not handled properly, it can cause various complications. Broadly speaking, chronic complications of diabetes are classified as macrovascular and microvascular, and microvascular has a much higher prevalence of complications. Neuroptai, retinopathy, nephropathy are the ones that go in microvascular complications. Meanwhile, stroke, cardioaslura disease, and peripheral artery disease are types of diseases that enter macrovascular complications (Papatheodorou *et al.*, 2018). Recently, there is a new technique, namely health coaching which is considered as an effort to treat and manage chronic diseases in all corners of the world. The focus of this approach in health training is on patients, especially for patients with diabetes mellitus, there are various meta-analysis studies revealing that health coaching interventions are able to provide assistance to increase HbA1C in the range of 0.3-0.6% over a period of 4 to 6 months. One intervention that has direct coaching and followed by monthly phone coaching for 6 months and up to 12 months to assess sustainability, this program consists of weekly and monthly phone calls in person or face contact for 6 months and 12 months. And there are health coaching interventions that have a positive impact on the management of type 2 diabetes mellitus (Pirbaglou *et al.*, 2018).

Lifestyle interventions and self-management support are effective strategies for managing and preventing the occurrence of type 2 diabetes mellitus and improving the quality of life in patients with diabetes mellitus in high-risk conditions with reversible increases in glucose levels, where glucose levels can be normalized through lifestyle change interventions (Glechner *et al.*, 2018). Thus, the methods used towards health coaching are very much getting special attention to improve healthy living behaviors. Where health care providers recognize the importance of self-care management done thoroughly by involving patients in the process directly (Riegel *et al.*, 2017).

The purpose of this literature review is to find out about the influence of health coaching on self-care and HbA1C in type 2 DM so that patients can prevent macrovascular or microvascular complications from occurring.

## METHODS

### Search Technique

The type of writing used is the study of the review literature conducted by the author after determining the research topic, the purpose of the research to collect and group the necessary data (Rodríguez-Carrio *et al.*, 2018).

This library review is carried out with the following stages: determining the appropriate review topic, and the article uses English, the library search is carried out using 3 online databases, namely: *PubMed*, *ProQuest*, *ScienceDirect*. The criteria for determining the review literature are carried out using keywords according to the title of writing such as "*Health Coaching OR Mentoring AND Self-Care AND HbA1C AND Diabetes Mellitus*". Articles are selected according to the established criteria, namely the publication time of 2015-2021. The search results of the article were obtained a total of 295 articles which were then reviewed using a systematic flow of PRISMA diagrams, so that the final results of 5 articles were eligible for analysis. Review analysis of this article using critical appraisal /JBI.

**Table 1. Inclusion and exclusion criteria**

	Inclusion	Exclusion
1.	Published article search 2015-2021	The article does not match the literature needed
2.	Search for published articles in English	Articles on type 2 DM patients
3.	The influence of health coaching on self-care and HBA1C in TYPE 2 DM as the main topics	Articles are not original, such as editor's letters
4.	There are abstracts and fulltext	Articles are only abstract and book-shaped.

## RESULT AND DISCUSSION

Health coaching aims to help individuals face-to-face or in person by monitoring healthy behavior changes using validated techniques such as motivation by conducting interviews. Health coaching behavior can be an effective program, and has a low cost, and flexible to be implemented through clinical and community regulations.

### Health coaching and behavior change

Health coaching is a way of empowering participants to actively have changes in their behavior by providing guidance and implementation related to things that have been learned during their health education in order to provide more specific and feasible changes to manage themselves with diabetes and there is effectiveness in promoting blood sugar management (Lin *et al.*, 2021). Research in this field, the majority only focused on the influence of behavioral interventions of patients who have type 2 diabetes mellitus to pursue a healthy diet, but only part of it gives an idea of a habit of self, such as increasing the intake of fruits and vegetables, lowering oily and fat intake, lowering carbohydrate intake. Diabetes self-management certainly has challenges, namely how to implement a diet appropriately or appropriately and how patients are able to provide fulfillment of this dietary standard with comfort without affecting daily life or work

then this diet can last a long time and can be monitored by telephone coaching face to face or directly (Lin *et al.*, 2021).

Referring to the journal (Timm *et al.*, 2021) things that are fairly efficient for sesoerang who have a diverse cultural language background and low economic status, namely by telephone coaching. The provision of this coaching by face to face by a health coach, then participants are asked to determine the purpose of HbA1C and its initial target for behavior change. This is done in addition to focusing on a healthy diet, self-regulating behavior with physical activity and monitoring blood glucose regularly. Discussions will also be held between the coach and his patients regarding the implementation schedule for action planning and conducting examinations with monthly calls followed by strengthening various values and responsibilities in self-management and empowering patients to have the activeness to change their behavior through guidance and implementation of things that have been learned in health education in order to bring changes towards a better direction and It is worth doing for the management of diabetes. The result of this research activity is, effective strategies in improving health for individuals who have a risk or have type two diabetes is with the support of self-management and lifestyle interventions through the use of empowerment approaches.

Referring to the journal (Charles C Chima *et al.*, 2021) The intervention focused on the use of his professional coaching skills, related to builders who were outside the patient's routine primary care team and contracted by primary care practices to give services. On the first coach and patient review the anxiety and threats of patients with diabetes care, therefore the patient identifies insulin self-management as a target for short-term coaching and immediate action plans

by scheduling an appointment with his or her doctor to discuss the insulin situation. And another short-term plan is to reduce his portions and increase his physical activity. The likelihood of increased adherence to insulin regimens due to coaching interventions is a driving factor in reducing ratings on the first item and the patient's glycemic control increases during the intervention. Health coach seeks to explain recipients and facilitate changes in health behaviors to achieve health or well-being goals with these coaching techniques being the basis of interventions and evolving especially motivatingly with interviews (Charles C Chima *et al.*, 2021).

Referring to the journal (Wayne *et al.*, 2015) Explanation of health coaching interventions, namely counseling specialists in changing behavior through special expertise for chronic disease management along with evidence-based theories that are in harmony with the condition of the disease. Through this health development, patients can set health-related goals and monitor their progress every day, monitor the patient's mobile input and brief attention based on 24 hours / day when resistance and recurrence are expected. The focus of his efforts is especially on improving exercise and modifying the diet to reduce carbohydrate intake. Communication can be carried out between patients and their health coach at any time at any time within 24 hours with phone contact, messages, or meeting in person. hbA1c experienced a noticeable decrease due to these findings, but there were no significant or noticeable differences among the group in HbA1c from baseline to 6 months based on per-protocol (P=.83) and intention to administer treatment (P=.48).

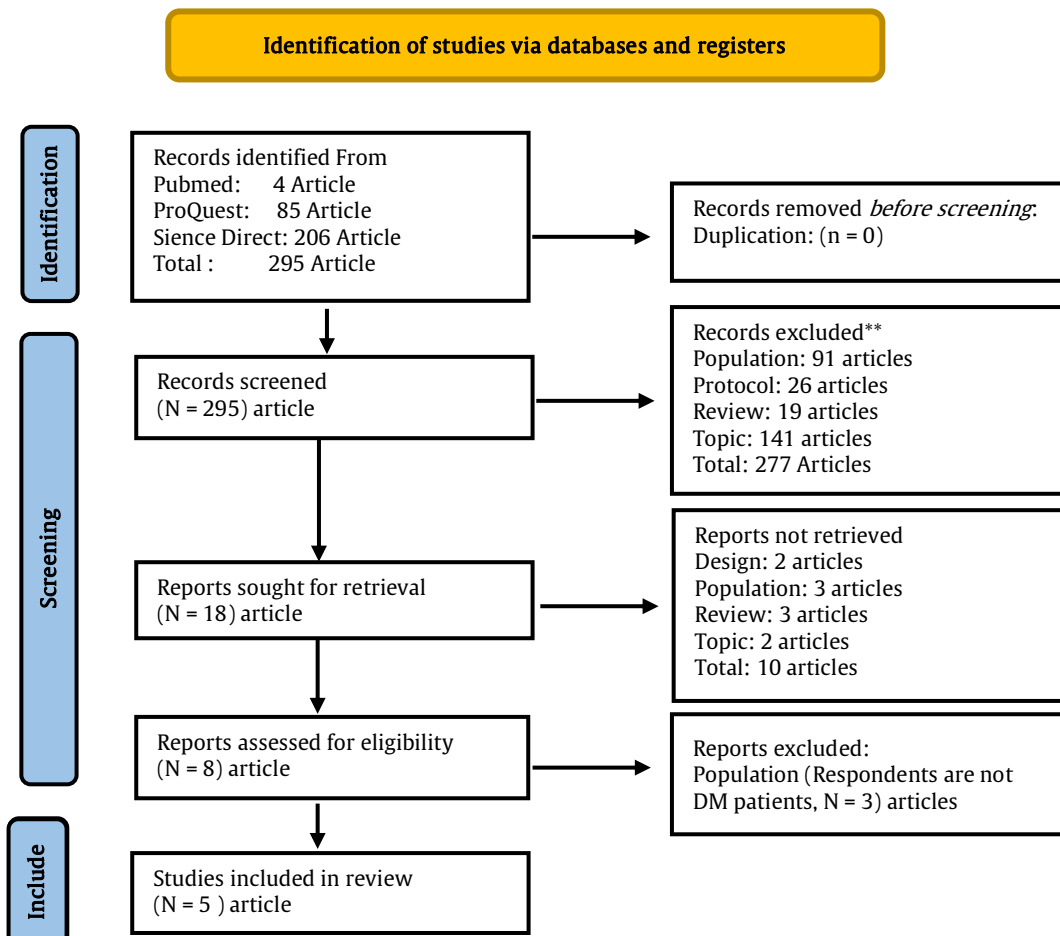


Figure 1: PRISMA flow diagram

### Health coaching program with Web-based help

The personal health coaching (PHC) approach already displays great hope for managing DMT2 and other chronic diseases. PhC program which is a category of self-management support interventions, so it is focused on relationships that have a common goal orient between patients and health professionals that aim to support involvement to change the pattern of life or self-management process of the disease. In particular, this PHC program provides patient assistance to implement goals in managing special self-care, monitoring compliance, providing diir efficacy support, addressing sources of disobedience to self-management regimens (Pirbaglou *et al.*, 2018).

The delivery of the PHC program is delivered through electronic telephone contacts such as web or mobile-based remote patient/electronic monitoring systems or in combination that include face-to-face meetings and telephone contacts. The 12 studies evaluated the average difference in HbA1c levels between PHC and the comparison group at intervals of 4 to 6 months of follow-up. Results at intervals of 4 to 6 months showed statistically significant combined glycemic management of -0.50% (P < .00001, 95% CI-0.65 to -0.35%). Within 7 to 9 months of follow-up only 2 studies gave an evaluation of the average difference in HbA1c levels between PHC and the comparison group and showed statistically significant overall differences and this provided an assessment of phc's effectiveness in improving glycemic management in DMT2 (Pirbaglou *et al.*, 2018).

### Successful health coaching of behavior change and HbA1c

Results from the literature review show that patients conducting health coaching delivered by clinicians (community nurses, doctors, and psychologists) programs in chronic disease management require a learning phase that includes the study of concepts in patient-centered communication, health psychologists, behavior change, and program evaluation. A number of DMT2 management approaches have been applied internationally to support individuals in self-management of their condition. DM has a form that is a complex chronic condition that requires efficient long-term medical management to avoid or delay chronic complications. This is to give certainty someone who has DMT2 to get a lot of support needed as an effort to

manage the psychological, physical, and social impact of the condition, combined clinical care with good quality and the importance of implementing self-management support (Chapman *et al.*, 2018).

Participants who are given face-to-face health coaching interventions and phone calls will be conducted by asking participants to determine the most productive place to start the discussion. Once the main problems were identified, the health coach guided the discussion with the fundamental goal of increasing participants' internal motivation and commitment to the disease changes experienced and participants received two phone sessions and two face-to-face training sessions per month Significant improvement in the group with an average HbA1c between the beginning and 18 months for both treatment groups (Chapman *et al.*, 2018).

Health coaches for diabetics have an effective role in improving HbA1c, lifestyle and patient behavior. Health coaching helps accelerate the improvement of the health of diabetic patients as a result of patient participation in treatment plans and knowledge of key issues. After providing information with health coaching methods to modify behaviors related to disease progression (DM). Coaching conducted by phone or face-to-face for fourteen sessions over 30 minutes, the effect given overall Diabetes health coaching is relevant about statistics decrease in HbA1c levels by 0.32 (95% CI, - 0.50 to -0.15) (Hamdy Soliman *et al.*, 2022).

Research (Hamdy Soliman *et al.*, 2022) It has been found that strengthening and maintaining exercise and physical activity increases HbA1c with little change in BMI studies as well as glycosylated hemoglobin (HbA1c) levels have been used in the planning and assessment of diabetes patient management.

Referring to the journal (Martin *et al.*, 2021) Demonstrate that diabetes health coaching can complement clinical care and guidance with a personal and ongoing encouragement, done easily to accessed formats such as phone, text, and email. Diabetes health coach program has positive results in HbA1c. Health training has ensuring for health development in order to develop glycemic influences with DMT2. In addition, the findings of this study proves that a person with a high risk of early glycemic will find a high benefit in physical and spiritual health in totality in knowing health coaching (Moskowitz *et al.*, 2013).

Table 2. Data extraction

AUTHOR, YEAR	SETTING & DESAIN	PARTICIPANT & DATA COLLECTION	AIM OF RESEARCH	FINDINGS
Ching-Ling Lin, Li-Chi Huang et al / 2021	Participants were recruited among patients with diabetes treated at Cathay General Hospital in Taipei from October 2019 to February 2020 (A Randomized Controlled Trial (RCT))	114 were randomly enrolled categorized into intervention groups and control groups. The subjects were randomly divided into an experimental group of 58 participants and a control group of 56 participants. Survey questionnaire	The purpose of this research is to facilitate the effectiveness of health development interventions within six months for HbA1c and a healthy diet as an effort to treat type 2 diabetes patients.	From the results of this study found a significant reduction in HbA1c and improvements in health diet after 6 months of health coaching.
Linda Timm, Ida Karlsson et al / 2021	Implementation of contextual type 2 diabetes self-management support in Sweden,	The participants were randomly grouped into interventions (n = 131) and control groups (n = 134)	Overall, the research with this mixed method has the goal of evaluating the accuracy of health training	An effective strategy is the encouragement in self-management and intervention in lifestyle through empowerment. This is done as an effort to improve health for

	South Africa and Uganda (mixed methods)	Interviews and questionnaires	and interventions with telephone facilities as an effort to prevent or manage type 2 DM through analysis of interactions between participants and facilitators in relation to supporting factors, dimensions, and challenges.	individuals who have a risk or have type 2 diabetes.
<b>Meysam Pirbaglou, Joel Katz et al / 2018</b>	Participants are recruited in multiple communities or at public practice clinics, Toronto hospitals, Ontario Canada (Randomized Controlled Trials (RCT))	There was no statistically significant difference between the intervention group and the control group, the average age of the participants was 60.0 years.  Interviews	The purpose of conducting this study is to display high appreciation in efforts to manage DMT2 and other chronic diseases as a category of self-management support interventions, and the PHC program focuses on relationships oriented towards common goals between patients and health professionals. This aims to support participation to change the process of self-management of diseases or lifestyle.	A meta-analysis of the 22 publications he selected, indicating a good impact related to PHC intervention in HbA1c levels in studies with follow-up for -3 months (-0.32% [confidence interval 95%), CI-0.55 to -0.09%]), 4 to 6 months (-0.50% [95% CI-0.65 to -0.35%]), 7 to 9 months (-0.66% [95% CI-1.04 to -0.28%]), and 12 to 18 months (-0.24% [95% CI-0, 38 to -0.10%]).
<b>Charles C Chima, Brenna Swanson et al / 2021</b>	The recruit was a non-Hispanic white American woman, Tampa Florida USA (Quasi Experiment)	A non-Hispanic white American woman who is 50 with a poor level of education will be given intervention groups and control groups over a 5-month period.  By telephone	The purpose of this study is to show a new approach in diabetes stress management efforts that requires a patient room with safety for his patients and not judgment to convey his feelings and explore diabetes self-management.	The five-month program, which has a duration of 45 minutes per session and has eight sessions with a health professional trainer, achieves patients to maintain a 0.8-point reduction in diabetic pressure, improves insulin adherence, and decreases 3.6 points on HbA1c.
<b>Noah Wayne, Daniel F Perez et al / 2015</b>	Participants recruited from 2 primary health clinics in Toronto Canada (A Randomized Controlled Trial (RCT))	Participants were 131 randomly assigned 67 for the intervention group and 64 for the control group.  By telephone and medical records	The study aimed to evaluate health coaching interventions with cell phone use to support changes in health behavior in patients with type 2 diabetes.	The results from the primary data were shown for 97 participants, namely (74.0%). Meanwhile, the two groups lowered their HbA1c levels, the differences shown were not noticeable enough between the various groups on hbA1c changes within six months using intentions for treatment (final observation submission [LOCF]) (P = 48) or per-protocol principle (P = 83). However, the intervention group achieved an accelerated reduction in HBA1c, and a marked reduction in hbA1c (P = 03). The fund decreased in the 6-month follow-up, this was due to a fairly good progress in the control group, and achieved a decrease of 0.81% (8.9 mmol / mol) (P = 0.001) compared to a decrease of 0.84% (9.2 mmol / mol) (P = 0.001) in the intervention group. This intervention group also had participants who gained real weight loss (P = 006) and waist circumference (P = 01) while the controls did not. Reports from these two groups saw an increase in life satisfaction, mood, and quality of life.

## LIMITATION OF THE STUDY

This article is only limited to the search sources for the three databases analyzed due to the lack of research that discusses this issue and all the literature sources obtained in this study are English articles.

## CONCLUSIONS AND SUGESTIONS

The results showed that health coaching can be an effective program to change behavior toward HbA1C and flexible to be implemented through clinical and community regulations. Then health coaching can help individuals face-to-face or in person by monitoring healthy behavior changes using validated techniques such as motivation by conducting interviews.

## ETHICAL CONSIDERATIONS

### Funding Statement

This research does not have sponsorship or support from any organization or agency

### Conflict of Interest Statement

The authors declares that there is no conflict of interest in the writing and publication of this paper. This paper can be accounted for by the authors.

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