EFFECT OF SELF-MANAGEMENT ON DIABETIC COMPLICATIONSAMONG PATIENTS WITH TYPE II DIABETES MELLITUS

Awad Hassan Amer Alshugaih[1]*, Ahmed Hasan Bn Amer Al Shokih[2], Ali Makfoor Shoil Algashanieen[3], Theeb Owaidh Farag Al Shageah[4], Hassan Mohamed Hassan Alyami[5], Majed Mana Haydee Al Hammam[6], Mohammed Abdullah Ali Almahri[7], Hussain Ali Hussain Al-Kanfari[8]

Abstract

Introduction: The prevalence of diabetes mellitus in Saudi Arabia was dramatically increased from 3.4 % in 1996 to 19.42% in 2012 and reached to 23.9% in 2013. The Saudi Press Agency (SPA) reported that the annual cost of diabetic care and its complication is exceeding four billion Saudi Riyals. Despite of the importance of diabetic educational programs in reducing the health care expenditure and improving the quality of care. This study aimed to review the evidence regarding the impact of self-management on the outcomes of diabetic mellitus.

Methods: A systematic search of articles focused on diabetes self-management education and support services was conducted. Articles were included if published between January 2013 and January 2022. We searched MEDLINE, CINAHL, EMBASE, ERIC, and PsycINFO for interventions which included elements to improve participants' knowledge, skills, and ability to perform self-management activities as well as informed decision-making around goal setting.

Results: Previous systematic reviews and meta-analyses sought to find evidence that self-management intervention using educational or behavioral strategies stimulates the individual's performance of diabetes self-care to increase target behavior actions such as blood glucose monitoring, diet care, physical activity and medical care among adults. These studies indicated modest but significant improvements in glycemic control in educational and behavioral interventions in diabetes, although, the improvement on glycemic control seemed to decrease over time.

Conclusions: The effect of self-management intervention on reduction in glycated hemoglobin seemed to be affected by baseline values of HbA1c. The higher baseline values of HbA1c, the greater the control of hyperglycemia after implementationof self-management.

Keywords: Diabetes Mellitus, Complications, Self-Management, Outcomes

[1]*Technician pharmacy, Najran general hospital, Najran
[2]Emergency Medical Services, King khaled hospital, Najran
[3]Technician pharmacy, Najran general hospital, Najran
[4]Nursing and Midwifery, Najran, Najran General Hospita
[5]Najran -Bader aljanuob, Social worker, Bader aljanuob hospital
[6]Nurse assiatant, Nahuqa primary health care center, Najran
[7]Technician pharmacy, Najran general hospital, Najran
[8]Job: Epidemiological observer, Work of place:Green health center, City: Najran

*Corresponding Author: - Awad Hassan Amer Alshugaih
*Technician pharmacy, Najran general hospital, Najran

Introduction
The prevalence of diabetes mellitus in Saudi Arabia was dramatically increased from 3.4 % in 1996 to 19.42% in 2012 (IDF internal national diabetic Middle East and North Africa (MENA) and reached to 23.9% in 2013 as the seventh of the top ten countries of highest diabetes prevalence [1]. With the increasing of diabetes prevalence, the diabetes related-complications will also increase. Of the aspects of diabetes care in Saudi Arabia, health education is the most deficient. The problems of diabetes care in Saudi Arabia include the lack of efficient diabetes care centers, lack of specially trained personnel, the high cost of anti-diabetic treatments, poor compliance with therapy or diet, ignorance and wrong beliefs, food and dietary factors and gender-related problems [2].

There is an almost total deficit of both diabetes nurse educators and educational material in care settings; however no evidence in Saudi Arabia examined the effectiveness of education intervention given to the patients with type 2 diabetes, comparing to the prevalence of the disease in Saudi Arabia. Therefore, this study will examine the effect of education intervention on self –care of patients with type 2 diabetes .The study results will provide knowledge and guidelines for improving self-care and delaying the onset and progression of diabetes-related complications of the population in Saudi Arabia [3].

The prevalence of diabetes mellitus in Saudi Arabia was dramatically increased from 3.4 % in 1996 to 19.42% in 2012. With the increasing of diabetes prevalence, the diabetes related-complications will also increase [2]. No evidence has been traced in Saudi Arabia examined the effectiveness of education intervention given to the patients with type 2 diabetes mellitus (DMT2), however, the prevalence of the disease in Saudi Arabia is high. Therefore, this study will examine the effect of education intervention on self–care of patients with type 2 diabetes .The study results will provide knowledge and guidelines for improving self-care and delaying the onset and progression of diabetes –related complications of the population in Saudi Arabia [3].
International diabetic federation (IDF) reported the global burden of this disease; 366 million people have diabetes in 2011; by 2030 this will have risen to 552 million. The number of people with type 2 diabetes is increasing in every country. The greatest number of people with diabetes are between 40 to 59 years of age, 183 million people (50%) with diabetes are undiagnosed, diabetes

caused 4.6 million deaths in 2011, diabetes costed at least USD 465 billion dollars in healthcare expenditures in 2011; 11% of total healthcare expenditures in adults (20-79 years). Recognition of the importance of glycemic control in the prevention of the complications and morbidity of DMT2 has led to worldwide campaigns for modifications in lifestyle and an intensive search for better antidiabetic medications [4, 5].

Methods
A systematic search of articles focused on diabetes self-management education and support services was conducted. Articles were included if published between January 2013 and January 2022. We searched MEDLINE, CINAHL, EMBASE, ERIC, and PsycINFO for interventions which included elements to improve participants' knowledge, skills, and ability to perform self-management activities as well as informed decision-making around goal setting.

Results and discussion
In the Kingdom of Saudi Arabia (KSA), the rise in the prevalence of DMT2 started to gain attention years after rapid industrialization took place in the country (6-8). Studies done since the late 1980s have shown an increasing trend among adult Saudis [9-11], the last of which, conducted in a large cohort of patients assembled from 1995 to 2000, revealed that one of five adult Saudis had DMT2 [12]. The same cohort showed an alarming prevalence of obesity at 40.0%, hypertension at 30% and coronary artery disease [CAD] at 6.2% [13, 14, 15]. A decade passed, and a follow-up epidemiologic study was designed to assess the current status of the population and whether the efforts of the Ministry of Health and the healthcare community have borne fruit.

Knowledge of the diabetes epidemic in Saudi Arabia is limited. Data come from a small-scale study that was carried out in 1996 showed that the prevalence of diabetes in Saudi Arabia is 3.4%.6 The most recent study done by IDF international diabetic Middle East and North Africa [MENA] in 2012, showed that more than 34.2 million people in the MENA region have diabetes; by 2030 this will rise to 59.7 million, and estimated the diabetes cause 356.586 deaths in the MENA region this year. The study classified Saudi Arabia as number four in diabetes cases in the region. The study also showed that from total population in Saudi Arabia which was 17,582,020 about 3,414,510 of them has diabetes, 241,710 is the number of adult with undiagnosed diabetes, the prevalence was 19.42%, the number of deaths

due to diabetes is 29.966 people, and the mean heath care expenditure per person with [USD] is 953.71. The escalating in diabetes prevalence, combined with its long term complications, will greatly increase in the burden of heath care [2]. Therefore, education on self-care of person with diabetes and preventing its complications would reduce the burden of the disease in the future [16].

Diabetes, the most common non-communicable disease in Saudi Arabia, is having an increasing impact on rates of morbidity and mortality in Saudi Arabia. [5-7] the spread of sedentary lifestyles and adoption of western dietary habits – high in refined carbohydrates and fat – are driving an increase in the number of people with obesity-related type 2 diabetes.

Self-management of diabetes involves a number of considerations and choices that the patient with diabetes must make on a daily basis. It requires that patients able to reconcile their resources, values and preferences with a therapeutic regimen of a healthy diet, exercise, no smoking, low alcohol intake, glucose monitoring and, for some patients, medication1. Self- management of diabetes is closely connected to the self-care concept, which can be related to the practice of activities that individuals initiate and perform on their own behalf in maintaining life, health, and well- being16, [17]. The self-care concept in this thesis is inspired by Orem theory of self-care and is seen as a health resource in the individual. The Orem theory of self-care as a fundamental need in humans is based on the values of autonomy and independence. In Orem's understanding, self-care is a learned and purposeful activity of the individual that requires a certain level of maturity enabling the individual to perform effective, purposeful, controlled and consistent actions[17].

The patient's own role in diabetes treatment and recognition of the need to educate patients in diabetes self-management has long been considered to be important. The concern about educating patients to take care of their diabetes began more than 100 years ago and was emphasized with the publication of the Diabetic Manual for the Doctor and Patient by Elliot Proctor Joslin in 1918 [19]. Since then several guidelines for diabetes care including education have been developed, among these The World Health Organization's guideline for a national program for diabetes mellitus [11], which stressed the importance of developing effective patient education programs to maintain the health and

quality of life of individuals with diabetes. Managing the daily care of diabetes seems to be a challenging task for many patients [16, 20], and a patient's ability to be involved in the daily routine of diabetes care seems to be grounded in psychological, motivational as well as educational factors [21].

The increase of diseases with a multifactorial etiology including a strong social component in prosperous countries has given rise to research in health prevention and health promotion [16; 17]. With regard to diabetes, the research in this area has focused mainly on how to encourage people with diabetes to undertake a prolonged regime of self-management. Previous systematic reviews and meta-analyses sought to find evidence that self-management intervention using educational or behavioral strategies stimulates the individual's performance of diabetes self-care to increase target behavior actions such as blood glucose monitoring, diet care, physical activity and medical care among adults. These studies indicated modest but significant improvements in glycemic control in educational and behavioral interventions in diabetes [22-28], although, the improvement on glycemic control seemed to decrease over time [26; 29; 30]. The effect of self-management intervention on reduction in glycated hemoglobin seemed to be affected by baseline values of HbA1c, i.e. the higher baseline values of HbA1c, the greater the reduction [23; 24; 31]. There was no strong evidence that interventions to improve self-management behaviors were effective in reducing morbidity and mortality among patients with diabetes. Studies to substantiate the effectiveness for self-management intervention to affect long-term behavior are therefore needed [30].

Effects on other outcomes such as lipids, weight and blood pressure varied [27; 29; 30] indicating the need for more studies to establish knowledge in this area. This was also true for research on psychological factors [24; 28; 32], though there was indication that psychological distress tends to fall among patients with diabetes who receiving psychological therapy [29]. The organization of self-management intervention including methodological strategies was not well expounded. The contact time [time in hours] between healthcare professional and patient, however, seemed to have an influence on the results [31], and strategies based on case management seemed to be more robust in improving glycemic control compared to other quality improvement strategies for type 2 diabetes

[25].

Conclusions

Controlling patients' blood sugar reduces the diabetic related complications, pressure on health care services and decreasing admission rate. It has also an impact in improving patient's quality of life. The effect of self- management intervention on reduction in glycated hemoglobin seemed to be affected by baseline values of HbA1c, i.e. the higher baseline values of HbA1c, the greater the reduction.

Conflict of interests

The authors declared no conflict of interests.

References

1. Naeem Z. Burden of Diabetes Mellitus in Saudi Arabia. International journal of health sciences.2015;9(3):V.
2. International Diabetes Federation,2011.diabtes at glance ,.midle east and north Africa region (MENA), 2012.
3. Aldossary A. Health care and nursing in Saudi Arabia, 2008.
4. World Health Organization. Prevention of diabetes mellitus. Report of a WHO Study Group. Geneva: World Health Organization; No. 844, 1994.
5. Ahmed AM, Ahmed NH, Abdulla ME. Pattern of hospital mortality among diabetic patients in Saudi Arabia. Practice Diabetes Int; 17: 41-3, 2000.
6. Ahmed AM. Diabetes mellitus in Saudi Arabia: size of the problem and possibilities of efficient care. Practice Diabetes Int; 18: 324-7, 2001.
7. Elbagir M, Eltom MA. A population-based study on prevalence of diabetes in northern SaudiArabia. Diabetes Care; 24: 1126-8, 1996.
8. Alzaid A. Time to declare war on diabetes. Ann Saudi Med; 17:154–155, 1997.
9. Fatani HH, Mira SA, El-Zubier AG. Prevalence of diabetes mellitus in rural Saudi Arabia. Diabetes Care;10:180–183. doi: 10.2337/diacare.10.2.180, 1987.
10. El-Hazmi M, Warsy A, Al-Swailem A, Sulaimani R. Diabetes mellitus as a health problem in Saudi Arabia. East Mediterr Health J; 4:58–67, 1998.
11. Gilles CL, Abrams KR, Lambert PC, Cooper NJ, Sutton AJ, Hsu RT, Khunti K. Pharmacological and lifestyle interventions to prevent or delay type 2 diabetes in people with impaired glucose tolerance: systematic review and meta-analysis. BMJ.;334:299. doi:

10.1136/bmj.39063.689375.55, 2007
12. Wilson GA, Gyi AA. The status and perspective of diabetes health education in China: inspiration from Australia. Int J Nurs Pract; 16:92–98. doi: 10.1111/j.1440-172X.2010.01817.x, 2010.
13. Al-Nozha MM, Al-Mazrou YY, Al-Maatouq MA, Arafah MR, Khalil MZ, Khan NB, Al-Marzouki K, Abdullah MA, Al-Khadra AH, Al-Harthi SS, Al- Shahid MS, Al-Mobeireek A, Nouh MS. Obesity in Saudi Arabia. Saudi Med J; 26:824–829, 2005.
14. Al-Nozha MM, Arafah MR, Al-Mazrou YY, Al-Maatouq MA, Khan NB, Khalil MZ, Al-Khadra AH, Al-Marzouki K, Abdullah MA, Al-Harthi SS, Al- Shahid MS, Nouh MS, Al-Mobeireek A. Coronary artery disease in Saudi Arabia. Saudi Med,004;25:1165–1171, 2005.
15. Al-Nozha MM, Abdullah M, Arafah MR, Khalil MZ, Khan NB, Al-Mazrou YY, Al-Maatouq MA, Al-Marzouki K, Al-Khadra A, Nouh MS, Al- Harthi SS, Al-Shahid MS, Al-Mobeireek A. Hypertension in Saudi Arabia. Saudi Med J,;28:77–84, 2007.
16. Funnel MM, Anderson RM. Empowerment and Self-Management of Diabetes. Clinical, 2012
17. Orem DE. Nursing: Concepts of Practice. 4th ed. St. Louis, MO: Mosby-Year Book Inc.; 1991.
18. Hoy B, Wagner L, Hall EO. Self-care as a health resource of elders: an integrative review of the concept. Scand J Caring Sci; 21(4):456-466, 2007.
19. Joslin EP. A diabetic manual for the doctor and patient. 8th ed. Philidelphia: Lea & Fibiger; 1948.
20. Reiber GE, King H. Guidelines for the development of a national programme for diabetes mellitus. Geneva, World Health Organization, Division of non-communicable diseases and health technology, 1991
21. Peyrot M, Rubin RR, Lauritzen T, Snoek FJ, Matthews DR, Skovlund SE. Psychosocial problems and barriers to improved diabetes management: results of the Cross-National Diabetes Attitudes, Wishes and Needs (DAWN) Study. Diabetes Medicine; 22(10):1379-1385, 2005.
22. Steed L, Cooke D, Newman S. A systematic review of psychosocial outcomes following education, self-management and psychological interventions in diabetes mellitus. Patient Educ Couns; 51(1):5-15,2003.
23. Type 2 diabetes. Health Technology assessment of screening, diagnosis and treatment. 2005. Copenhagen, Denmark,

National Board of Health, Danish Centre for Evaluation and Health Technology Assessment. Danish Health Technology Assessment 2005.

24. Van Dam HA, van der Horst F, van den Borne B, Ryckman R, Crebolder H. Provider-patient interaction in diabetes care: effects on patient self-care and outcomes. A systematic review. Patient Educ Couns; 51(1):17-28, 2003

25. Coates VE, Boore JR. Self-management of chronic illness: implications for nursing. Int J Nurs Stud; 32(6):628-640, 1995.

26. Shojania KG, Ranji SR, McDonald KM, Grimshaw JM, Sundaram V, Rushakoff RJ et al. Effects of quality improvement strategies for type 2 diabetes on glycemic control: a metaregression analysis. JAMA; 296(4):427-440, 2006.

27. Patientutbilding vid diabetes. En systematisk litteraturöversikt. SBU. Statens beredning för medicinsk utvärdering. Self-management in diabetes care, 2009.

28. Deakin T, McShane CE, Cade JE, Williams RD. Group based training for self-management strategies in people with type 2 diabetes mellitus. Cochrane Database Syst Rev;(2):CD003417, 2005.

29. Gary TL, Genkinger JM, Guallar E, Peyrot M, Brancati FL. Meta-analysis of randomized educational and behavioral interventions in type 2diabetes. Diabetes Educ; 29(3):488- 501, 2003.

30. Ismail K, Winkley K, Rabe-Hesketh S. Systematic review and meta-analysis of randomized controlled trials of psychological interventions to improve glycaemic control in patients with type 2 diabetes. Lancet 2004; 363(9421):1589-1597.

31. Norris SL, Engelgau MM, Narayan KM. Effectiveness of self-management training in type 2 diabetes: a systematic review of randomized controlled trials. Diabetes Care; 24(3):561-587, 2001.

32. Norris SL, Lau J, Smith SJ, Schmid CH, Engelgau MM. Self-management education for adults with type 2 diabetes: a meta-analysis of the effect on glycemic control. Diabetes Care; 25(7):1159-1171,2002.