International Journal of Diabetes
IJD, 1(2): 29-32
www.scitcentral.com

ISSN: 2644-3031

Review Article: Open Access

Review of the Evidence for the Benefits of Structured Education in Type 2 Diabetes

Rajesh Jain*, Susanne Olejas, Alexander Edwards, Ani Rashel Feh, Muhammad Iqbal, Satrupa Ragoonanan, Ibina Abigo, Rachel Davies, Zoonifer Khan, Nisha Benoy, Wioleta Zietek and Patrick Commettant

Jain Hospital, Vinobha Nagar, Kanpur-208007, India.

Received June 07, 2019; Accepted June 17, 2019; Published November 11, 2019

INTRODUCTION

Globally, type 2 diabetes accounts for the majority of deaths, sufferings and burden to individuals and health care services [1]. There is a wealth of evidence to prove that high quality structured diabetes self-management education (DSME) can have significant effect on health outcome and enhance patients' quality of life. [2]. This summative report aims at reviewing the evidence for the benefits of structured education in Type 2 diabetes.

KNOWLEDGE

DSME is the cornerstone to successful everyday diabetes management and can be transformative for individuals suffering from diabetes [3]. This is evident in a systematic review of group-based education for patients with Type 2 diabetes in which 21 randomised controlled trials (RCTs) on diabetes structured education were assessed. This study revealed major improvement in participants' knowledge about diabetes [4].

CLINICAL OUTCOME, SELF-MANAGEMENT AND BEHAVIOR CHANGE

DSME programmes have also shown major improvement in glycemic control and diabetes outcomes. Norris et al. [5] demonstrated that HbA1c levels decreased by 0.76% in participants who undertook DSME. Chrvala et al. [6] also reviewed existing literature and found similar reductions in HbA1c, with the greatest reduction of 0.88% in both individual and group setting for participants who completed DSME. Nonetheless, in the former studies the effect of DSME was not sustainable long after intervention amongst participants in comparison with the latter. This is quite substantial as the United Kingdom Prospective Diabetes Study (UKPDS) demonstrated that even a 0.9% decrease in HbA1c is associated with reductions in micro-vascular complications, diabetes-related mortality and all-cause mortality [7].

In the UK, DESMOND's (Diabetes Education and Self-Management for On-going and Newly Diagnosed) intervention has yielded similar results. Khunti et al. [8] reported a 1.49% decrease in HbA1c after 12 months and a sustained decrease after 3 years (-1.32%). However, there were no significant differences in other biomedical factors such as blood pressure and 10 year cardiovascular disease risk. In similar terms the reviews by DESMOND and 8 showed that greater exposure to structured education was linked to better glycemic control. An Italian based intervention, ROMEO (Rethink Organization to iMprove Education and Outcomes), built on the efforts of these earlier studies to develop a lifestyle-change education programme focusing on metabolic control, which was carried out over a longer duration of 2 years. The findings demonstrated that the participants in the ROMEO study had improved HbA1C, lipid profile, blood pressure and BMI than in control groups [9]. This suggests that an on-going model of structured education may result in improvements in glycemic control as well as other biomedical factors, which can likely lead to less long term complications.

In addition to improving health outcomes in individuals with type 2 diabetes, DESMOND's programmes also showed that structured education was beneficial in helping participants self-manage their diabetes and change health behaviors [4].

Corresponding author: Dr. Rajesh Jain, Jain Hospital, 108 B Gandhi Gram, Vinobha Nagar, Kanpur-208007, India, E-mail: drrajeshjain@diabetesasia.org

Citation: Jain R, Olejas S, Edwards A, Feh AR, Iqbal M, et al. (2019) Review of the Evidence for the Benefits of Structured Education in Type 2 Diabetes. Int J Diabetes, 1(2): 29-32.

Examined this and found that after 12 months, the odds of having stopped smoking were up to 3.5 times higher in the intervention group than the control group. Positive results were also seen in areas of physical activities and diet change. Rygg et al. [10] in their study "examined the experience of participants in DSME in relation to change in diet and physical activity and the generating learning process that facilitated this change". Their findings revealed that participants experienced a life of more confidence, security, increased control and well-being. The participants also experienced significant improvement in their diet and physical activity 6 months after completing the DSME programme. Similar findings of improved diet was reported by X-PERT programmes [11] and significant increase in the frequency of physical activity was reported by Daavies et al. [4] in their RCTs. X-PERT programmes also showed positive results in the area of self-management of blood glucose (SMBG) although, increase in SMBG only lasted for 4 months. Results after 14 months revealed no significant difference between participants and the control group [11]. Nevertheless, The Diabetes Equity Project (DEP), in their study, confirmed improvement in regularity of SMBG which lasted 12 months. SMBG and results of other activities indicated increased competence in managing their diabetes.

These education programs did not specifically measure adherence to medical treatment and care, though the positive results would suggest that overall adherence improved. Van Netten et al. [12] in their systematic review of 30 studies with 19 RCTs revealed that DSME may have no impact in improving foot care behavior.

SELF-DETERMINATION AND PSYCHOSOCIAL ADJUSTMENT

Khunti et al. [8] in his research has conclusively proven that well-structured education programs have contributed tremendously towards self-determination and mental adjustments in patients with diabetes. This is corroborated with the study from Essien et al. [13] which indicated that DSME and social support has positive effect on self-efficacy and patient's empowerment. There are also studies suggesting that DSME has proven to promote healthy coping mechanisms and decrease diabetes related distress and depression in their studies evidence significant improvement of quality of life for participants with diabetes related stress after completing the DSME [8,14,15].

LONG-TERM OUTCOMES

Although many studies have shown that structured education can cause significant improvement in lifestyle, clinical and psychosocial outcomes; its role in the prevention of diabetes complications is an area of emerging research.

An early study by Nicolucci et al. [16] showed that complications such as; critical limb ischemia, amputation, chronic renal failure, dialysis treatment, proliferative retinopathy and blindness can occur approximately 4 times more often in diabetic individuals with no education.

A more recent study that looked at the effects of glycemic control and incidence of cardiovascular complications showed that Patient Empowerment Programme participants were associated with lower incidence of first micro-vascular event and nephropathy [17].

The population-based cohort analysis study of Patient Empowerment Programme by Wong et al. [18] in obese type 2 diabetes patients again revealed that Patient Empowerment Programme participants had lesser incidence rates of all-cause mortality and first macro-vascular or micro-vascular disease events from diabetes.

A systematic review of literature from 2001 to 2011 by Nazar et al. [19] revealed that diabetes complications could be minimized by developing enhanced diabetes knowledge and education to treat diabetes at the right time. This can in turn reduce morbidity and mortality amongst patients with diabetes. These studies further explored that amputation rates can be reduced through DSME which in turn can result in huge cost savings.

A long-term study with 13 year follow up investigated the impact gender may have on diabetes outcomes and found that structured education was able to reduce mortality and morbidity in women but not in men [21].

Another systematic review and meta-analysis by He et al. [22] also suggested that DSME can reduce all-cause mortality risk in type 2 diabetic patients with risk reduction estimated to be 4 per 1000 person less yearly.

UTILISATION OF HEALTH CARE SERVICES

Although there is a wealth of evidence to prove that DSME can improve the health outcome and life quality for the individual with Type 2 diabetes, there is very limited recent research to prove that DSME can minimise the use of healthcare services.

Norris et al. [23] in a systematic review of five studies only reported one study that experienced reduction in emergency room visits four months after receiving DSME. Their findings from four other studies on admissions outcomes and hospital length of stay showed no major difference between participants who had DSME and the control group. Greisinger et al. [24] reviewed one study that covered hospitalizations between 1993 and 2001 and concluded that patients with low income served by primary healthcare could react differently to these services than patients with high-income. There was no significant reduction in the use of eye specialist services as reported by Norris et al. [25].

DELIVERY MODE AND COST EFFECTIVENESS

DSME can be delivered by nurses, physicians, specialist and other healthcare professionals in hospitals, community, outpatient clinics, diabetes centres and in primary care

settings. DSME can be delivered as a group or one- to-one session depending on the individual's needs. Both groups and individual education have shown to have significant improvements in participants' clinical outcome and lifestyle changes according to systematic review studies carried out by Chrvala et al. [6] and Van Netten et al. [12]. According to Van Netten et al. [12], the yearly cost for each participant without labor and admin in the X-PERT structured programme was £26. On average, one medication cost £433 yearly. However, after completing the DSME with people having better outcome, it is estimated that the cost for medication savings was £56,723 for 432 diabetic patients. Hence, over £367 million could be saved yearly if all 2.8 million patients with diabetes in the UK participated in X-PERT programmes.

CONCLUSION

In conclusion, this essay has examined the review of the benefits of structured education in type 2 diabetes in relation to increasing patients' knowledge, self-management, behavior change, clinical outcome, healthcare service utilisation, long term outcomes, psychological adjustment and self-determination. It further looked into the effectiveness of the delivery modes of type 2 diabetes structured education and also discussed the cost effectiveness and socio-economic implication of type 2 diabetes structured education. In the studies reviewed, there is no concrete evidence that diabetes structured education may reduce the use of healthcare service and 10 year cardiovascular risk. Nonetheless, there is substantial evidence that diabetes structured education can improve the general heath outcome of individuals with type 2 diabetes especially in areas such as physical activities, diet, medication adherence, smoke cessation, glycemic control as well as the psychosocial well-being of the individual with type 2 diabetes. Diabetes structured education can also reduce the huge cost on both individuals and health care services.

REFERENCES

1. International Diabetes Federation (2017) Diabetes Atlas. 8th Edn. Available at: http://www.idf.org/diabetesatlas (Accessed: 13 May 2018).
2. Odgers-Jewell K, Ball LE, Kelly JT, Isenring EA, Reidlinger DP, et al. (2017) Effectiveness of group-based self-management education for individuals with type 2 diabetes education: A systematic review with meta-analyses and meta-regression. J Br Diabet Assoc 34: 1027-1039.
3. Skinner TC, Carey ME, Cradock S, Daly H, Davies MJ, et al. (2006) Diabetes education and self-management for on-going and newly diagnosed (DESMOND): Process modeling of pilot study. Patient Educ Couns 64: 369-377.
4. Davies MJ, Heller S, Skinner TC, Campbell MJ, Carey, et al. (2008) Effectiveness of the diabetes education and self-management for on-going and newly diagnosed (DESMOND) programme for people with newly diagnosed type 2 diabetes: Cluster randomised controlled trial. Br Med J 336: 491-495.
5. Norris S, Lau J, Smith S, Schmid C, Engelgau M (2002a) Self-management education for adults with type 2 diabetes: A meta-analysis of the effect on glycemic control. Diabetes Care 25: 1159-1171.
6. Chrvala C, Sherr D, Lipman R (2016) Diabetes self-management education for adults with type 2 diabetes mellitus: A systematic review of the effect on glycemic control. Patient Educ Couns 99: 926-943.
7. United Kingdom Prospective Diabetes Study (UKPDS) Group (1998) Effect of intensive blood-glucose control with metformin on complications in overweight patients with type 2 diabetes (UKPDS 34). Lancet 352: 854-865.
8. Khunti K, Gray L, Skinner T, Carey M, Realf K, et al. (2012) Effectiveness of a diabetes education and self-management programme (DESMOND) for people with newly diagnosed type 2 diabetes mellitus: Three year follow-up of a cluster randomised controlled trial in primary care. Br Med J 344: e2333-e2333.
9. Trento M, Gamba S, Gentile L, Grassi G, Miselli V, et al. (2010) Rethink Organization to iMprove Education and Outcomes (ROMEO): A multicenter randomized trial of lifestyle intervention by group care to manage type 2 diabetes. Diabetes Care 33: 745-747.
10. Rygg LO, Lohre A, Hellzen O (2017) Lifestyle changes in diet and physical activities after group education for type 2 diabetes — the active ingredient in the education: A qualitative study. Open J Nurs 7: 1181-1190.
11. Deakin TA, Cade JE, Williams R, Greenwood DC (2006) Structured patient education: The Diabetes X-PERT Programme makes a difference. Diabet Med 23: 944-954.
12. Van Netten JJ, Price PE, Lavery LA, Monteiro-Soares M, Rasmussen A, et al. (2016) Prevention of foot ulcers in the at-risk patients with diabetes: A systematic review. Diabetes Metab Res Rev 32: 84-98.
13. Essien O, Out A, Umoh V, Enang O, Hicks JP, et al. (2017) Intensive patient education improves glycemic control in Diabetes compared to conventional education: A randomized controlled trial in a Nigerian Tertiary Care Hospital. PLoS One 12: e0168835.
14. Tang TS, Funnell MM, Oh M (2012) Lasting effects of a 2 year diabetes self-management support intervention: Outcome at 1 year follow-up. Prevent Chronic Dis 9: E109.

15. Steinsbekk KA, Rygg LQ, Lisulo M, Rise MB, Fretheim A (2012) Group based diabetes self-management education compared to routine treatment for people with type 2 diabetes mellitus: A systematic review with meta-analysis. BMC Health Serv Res, p: 23.

16. Nicolucci A, Cavaliere D, Scorpiglione N, Carinci F, Capani F, et al. (1996) A comprehensive assessment of the avoidability of long-term complications of diabetes: A case-control study. SID-AMD Italian Study Group for the Implementation of the St. Vincent Declaration. Diabetes Care 19: 927-933.

17. Wong C, Wong W, Wan Y, Chan A, Chan F, et al. (2015) Patient Empowerment Programme (PEP) and risk of microvascular diseases among patients with type 2 diabetes in primary care: A population-based propensity-matched cohort study. Diabetes Care 38: e116-e117.

18. Wong C, Wong W, Wan E, Chan A, Chan F, et al. (2016) Macrovascular and microvascular disease in obese patients with type 2 diabetes attending structured diabetes education program: A population-based propensity-matched cohort analysis of Patient Empowerment Programme (PEP). Endocrine 53: 412-422.

19. Nazar CMJ, Bojerenu MM, Safdar M, Marwat J (2016) Effectiveness of diabetes education and awareness of diabetes mellitus in combating diabetes in the United Kingdom: A literature review. J Nephropharmacol 5: 110-115.

20. Gazzaruso C, Fodaro M, Coppola A (2016) Structured therapeutic education in diabetes: Is it time to re-write the chapter on the prevention of diabetic complications? Endocrine 53: 347-349.

21. Krag MØ, Hasselbalch L, Siersma V, Nielsen A, Reventlow S, et al. (2015) The impact of gender on the long-term morbidity and mortality of patients with type 2 diabetes receiving structured personal care: A 13 year follow-up. Diabetologia 59: 275-285.

22. He X, Li J, Wang B, Yao Q, Li L, et al. (2016) Diabetes self-management education reduces risk of all-cause mortality in type 2 diabetes patients: A systematic review and meta-analysis. Endocrine 55: 712-731.

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

24. Greisinger AJ, Balkrishnan R, Shenolikar RA, Wehmanen OA, Muhammad S, et al. (2004) Diabetes care management participation in a primary care setting and subsequent hospitalization risk. Dis Manage 7: 325-332.

25. Norris SL, Nichols PJ, Caspersen CJ, Glasgow RE, Engelgau MM, et al. (2002b) Increasing diabetes self-management education in community settings - A systematic review. Am J Prev Med 22: 39-66.