

Education and diabetes mellitus

Marina Kosti¹, Maria Kanakari²

1. RN Nursing Department A, TEI Athens, Greece

2. Undergraduate Nurse, Department A, TEI Athens, Greece

ABSTRACT

Background: Diabetes mellitus is a multifactorial disease that requires long-term care since it involves major changes in both physical and psychosocial dimension of each patient. Diabetes education is a critical element of care that improves patient outcomes.

Aim: The aim of the present study was to review the literature about the education in Diabetes mellitus management.

Method: The method of this study included bibliographic research of the literature from reviews and researches, mainly in the PubMed data base, which referred to education in Diabetes mellitus management. PubMed was searched using the following key search terms: "Diabetes mellitus", "self-management", "education" while the research covered the period 1999-2012.

Results: According to the literature, education should not be a mere transmission of information, but a dynamic, holistic, planned care based on individual's needs (patient-centred approach). Furthermore, education promotes self-management and health-related behaviour modification. Moreover, education should be consistent with individual's learning skills and psychosocial state. Diabetes education should be reinforced after its' completion and enhance in depth understanding of the significance of check-up and follow-up. Last but not least effective education requires good communication among diabetic patients and health professionals.

Conclusions: The overall goal of diabetes education is to help individuals and their families gain the necessary knowledge, life skills, resources and support needed to achieve optimal health.

Key words: Diabetes mellitus, self-management, education.

CORRESPONDING AUTHOR

Kosti Marina,

Axariou 58,

Anthoupoli,

Peristeri, Athens

Email: marinakosti@hotmail.com

INTRODUCTION

Diabetes mellitus (DM) consists an enormous public health problem globally, associated with high morbidity

and mortality. The disease expected to take dimensions of an epidemic is often called "the scourge of modern times."

Furthermore, the disease involves a variety of implications, such as personal, family, social as well as high cost for the National Health System for each country due to long hospitalization, diagnostic tests, e.t.c.¹⁻⁵

Diabetes is a disorder characterized by impaired metabolism of carbohydrates, proteins and fats due to inadequate or inefficient activity of insulin. Type II diabetes is characterized by insulin resistance (reduced sensitivity of cells to insulin), a relative insulin deficiency, or both. Type II diabetes usually develops in adulthood, and most patients are obese.¹⁻⁵

The World Health Organization estimates that the total number of diabetics worldwide will reach 333 million in 2025 from 135 million in 1995.¹⁻⁵ Regarding western world Diabetes mellitus is one of the most common chronic since in 2007, it was estimated that there were 246 million people with diabetes compared to 194 million in 2003.¹ This significant increase is expected to take place both in developing and developed countries and is mainly attributed to the modern way of living including sedentary lifestyle, stress and unhealthy nutritional dietary habits.¹⁻⁵

Diabetes is not a disease of contemporary society but it has been

recognized since ancient times in the 2nd century BC, when the Greek physician Aretaeus from Cappadocia described its' symptoms. From that time onwards, the pathogenesis of diabetes still has not been fully understood and draws a great deal of attention by the vast majority of literature.¹⁻⁵

Almost three decades ago, maintenance of patients' life was the main therapeutic goal by health professionals, particularly for those suffering from insulin-dependent diabetes. Nowadays, the increase in Diabetics' life expectancy has highlighted the issue of complications such as micro and macro vascular complications (micro and macro-angiopathy). Furthermore, over the last decades much progress in outcome of diabetes mellitus treatment has been within the field of self management and care. Indeed, the reports of patients who lived 40-50 years without some severe complications following "treatment", indicated that the key-element to confront the disease is the effective management of diabetes.¹⁻⁵

Diabetes mellitus and education

During recent years, the important role of education regarding Diabetes mellitus self management has been demonstrated

by numerous studies, globally. Interestingly, many patients seek education about their therapeutic regimen thus confirming the significance of this issue. Furthermore, it has been acknowledged that treatment of the disease is more related to lifestyle and less related to the quality of the provided health care and services.⁶⁻¹⁰

Therefore, education promoting health-related behaviour modification through knowledge as well as enhancing the belief that patients themselves are the main manager of their own health has come to the forefront of clinical practice.⁶⁻¹⁰ However, the roles that patients prefer in making medical decisions (i.e., active, collaborative, or passive roles) appear to be related to the level of participation (active or not) in decision-making about their treatment. Those who prefer active or collaborative roles have higher odds of participation in their therapeutic regimen.³ Therefore, enhancing active patient participation in medical decision-making should be an integral part of education approach. However, more attention should be paid to those with less than high school education because they are at risk of poorer understanding of their required self-care.³

Educated patients can positively affect the outcome of the disease. Indeed,

through education patients can : a) optimize metabolic control including self-monitoring of blood or urine glucose, dietary practices, medicine administration, b) relieve the symptoms of the disease or handle with emergencies and disease-related exacerbations, c) prevent and manage complications such as micro-and macro-vascular complications, d) adopt of a more positive attitude to the disease, and e) support the clinician-patient relationship and plan of care including follow-up.^{1-5,11,12}

On the contrary, failure of attending education is held responsible for frequent re-hospitalizations, disease complications and poor life quality. Not surprisingly, these patients do not follow lifestyle modifications suggested by health care professionals or are reluctant to comply with the recommended medical guidelines and be actively engaged in self-managing their diabetes.¹³

Education is a fairly complex process, which varies among people and the main question arising from literature is when is the right time is to start education, for example immediately after diagnosis or when the patient has overcome the anxiety of the first days. However, education should be delivered as soon as possible after a newly diagnosed type II

diabetes mellitus whereas different strategies appear to be necessary for patients with a longer diabetic duration to achieve meaningful diabetic education. Diabetes education in recently diagnosed diabetic patients has more favorable clinical outcomes, as compared to the outcomes of patients with a longer duration of diabetes prior to education.^{1,2}

A patient-centred approach focused on patients' needs, resources, values and coping strategies is a prerequisite for starting therapeutic patient education. This approach allows patients to improve their knowledge and skills not only concerning their illness but also their treatment. It is a commonly held view that needs vary according to several demographic and clinical parameters, such as age, socio-economic status, cultural background, personality, severity of disease, complications, prior experiences, level of understanding of instructions, acceptance of the disease, etc.¹⁴⁻¹⁶

Another significant area related to education is setting a realistic goal of behavior changing. Patients should not be trapped into unrealistic expectations, but be fully informed about the real dimensions of their condition and decide with health professionals the best

treatment option. It is worth noting that the design of educational intervention requires an overall approach including involvement of health professionals, patients and their families as well as fulfillment of patients' expectations, needs and preferences.¹⁴⁻¹⁷

The contents of the curriculum of education should be dynamic and needs to reflect current evidence and practice guidelines.⁷ The including contents are: fundamental knowledge about Diabetes, principles about nutrition and physical activity, prevention of complications and modification of risk factors. Additionally, the contents of the curriculum include specific technical skills such as subcutaneous (sc) injection of insulin, the use of glucometer and self-monitoring of blood or urine glucose levels. Equally important is the implementation of a daily program to control glucose, involving meal planning snack according to the daily requirements and insulin administration according to the level of glucose. Other important parameter that need to be integrated in the contents of the curriculum is accurate and elaborate informing about possible complications. For example, informing about prevention and treatment of diabetic foot including early recognition of the diabetic foot,

daily self-care, proper footwear, modification of the way of living and adherence to the instructions of healthcare team.^{1,2,17-21}

The following step while designing an education involves the selection of teaching methods : lecture, discussion and demonstration. The choice of method depends on staff and environment availability, and patients characteristics. Information should be presented through written materials, audio-visual media and physical objects. The use of media, where the student has the opportunity to see the techniques and skills required for an effectively management contributes to a better learning. Additionally, the implementation of these skills under the educator's supervision is of significant value.¹⁻⁴

The teaching methods are individual approach and structured group education approach. Although the individual approach predominates over the group for the reason that it is designed based on individual needs, however, group education approach implying communication with other patients experiencing the same problem seems to be more beneficial in promoting of learning. Communication with other support groups or communication and coordination of services between patient,

physician, disease management organization, and other providers plays also an important role.²²⁻²⁶

Whatever the method of education approach is, the cornerstone of its' success is the use of simple and understandable language without scientific terms that depends on individual's personality and comprehension ability. Equally important factors for education success are appropriate learning environment and duration of sessions. In particular, the learning environment should be quiet for ensuring greater understanding of the instructions, and avoidance of attendance distraction. If the program is a group one, participants should be maximum ten, while session period should not be long, that is, more than 60 minutes.^{1-4,16,17}

Educational interventions delivered by a single educator, in less than ten months, with more than 12 hours and between 6 and 10 sessions give the best results but more research is needed to confirm this. In general it can be concluded that group-based education approach results in improvements in clinical, lifestyle and psychosocial outcomes.¹

Assessment of education outcomes seems to be the most neglected aspect. In particular, understanding of acquired knowledge both in theory and practice

should be re-evaluated. Moreover, encouragement of expression enables the discussion of fears and concerns, such as anxiety, anger, despair, guilt. Furthermore, re-evaluation reveals areas where gaps in knowledge impede effective management such as inability of solving acute problems or handling signs and symptoms of complications etc. Diabetes patients who discuss their treatment goals and management strategies with their physicians tend to have better clinical outcomes than those who do not.¹⁻⁴

It is widely known, that daily life of diabetic patients is disrupted by the need for regular monitoring of blood glucose, taking medication and balancing the effects of activity and nutrition. Moreover, patients experience constant threat of severe and devastating diabetic complications or bothersome symptoms throughout their lives. Consequently, Diabetes exerts a major psychological distress on the lives of patients who often need psychological support and counseling.¹⁻⁴

At the other side of the spectrum, comorbid chronic illness (e.g., depression and chronic pain) or psychosocial problems can pose significant barriers to diabetes self-management.⁷

The effectiveness of education is not only assessed by the accuracy of the knowledge acquired once in a time but needs re-evaluation because the strength of education outcomes weakens or knowledge changes over time. A well-designed program demands regular reinforcement involving follow-up after program completion and thereafter on an systematic basis. Regular, and sustained reinforcement with encouragement may be required for individuals with type II diabetes for various reasons. Specifically, either patients are not susceptible to learning on a training period, or initial education program may be inadequate, or even new methods (medical and educational) have been discovered. Moreover, patient's needs change or new needs arise. For all the above reasons, annual attendance of reinforcement education including a review of self-management and the presentation of new topics, such as diabetes complications, obesity, and dyslipidemia is crucial.^{1-4,7}

Reinforcement of education ensures long-term blood glucose control, as the person remains adherent to what has been taught, checks the accuracy of acquired knowledge, has access to new data or even facilitates the development of new practices and new behavior

patterns. In addition, reinforcement of education should be supported by other programs or events, such as patients weekend trips, celebrations for diabetics families, etc.¹⁻⁴

In diabetes self-management education, the close involvement of patients and care givers is encouraged. Effective communication has been shown to influence patient decisions about their health practices and behaviors associated with health outcomes. More in detail, it provides patients with accurate information, emotional support, opportunities for shared decision-making, agreement on the nature of their medical problems and the need for follow-up.³

A multidisciplinary team is responsible for designing the curriculum and assisting in the delivery of education. The ever-changing health care environment apart from registered nurses, registered dietitians, and pharmacists, evolves other health professionals such as physician, behaviorist, exercise physiologist, ophthalmologist, optometrist, podiatrist, e.t.c. Expert consensus supports the need for specialized diabetes and educational training beyond academic preparation for the primary instructors on the diabetes team.⁷

It is worth mentioning that education delivered by one person requires evaluation of person's ability and qualities (clinical, pedagogical and personal) more than the actual content and quality of the intervention. As a matter of fact the same education programme delivered by different persons in the same settings might not give the same results.¹⁻⁴

Well trained and experienced educators who take into account the patient's perspective on health inspire confidence to the patients and provide them the opportunity to find out the right way to disease management through correcting their mistakes. Finally, health professionals ought to improve their performance through feedback and/or reports on patient progress in compliance with protocols.¹

Conclusions

Taken for granted the enormous impact of diabetes mellitus on each patient is understandable why this disease is considered as matter of major concern. Education is an investment for both patient and health professionals, as well as the key to promote and improve diabetics' quality of life.

REFERENCES

1. Steinsbekk A, Rygg L, Lisulo M, Rise M, Fretheim A. 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 Services Research*. 2012, 12:213.
2. Seung-Hyun Ko, Sin-Ae Park, Jae-Hyoung Cho, Sun-Hye Ko, Kyung-Mi Shin, Seung-Hwan L, et al. Influence of the Duration of Diabetes on the Outcome of a Diabetes Self-Management Education Program. *Diabetes Metab J*. 2012; 36(3): 222–229.
3. Quinn Ch, Royak-Schaler R, Dan Lender D, Steinle N, Gadalla Sh, Zhan M. Patient Understanding of Diabetes Self-Management: Participatory Decision-Making in Diabetes Care. *J Diabetes Sci Technol*. 2011;5(3):723-730.
4. Olivarius NF, Beck-Nielsen H, Andreasen AH, Hjørder M, Pedersen PA. Randomized controlled trial of structured personal care of type 2 diabetes mellitus. *BMJ*. 2001;323(7319):970–5.
5. Hjelm K, Mufunda E, Nambozi G, Kemp J. Nurses to face the pandemic of diabetes mellitus, a literature review. *J Adv-Nurs*. 2003;41(5):424-3.
6. Mensing C, Boucher J, Cypress M, Weinger K, Mulcahy K, Barta P, et al. National standards for diabetes self-management education. *Diabetes Care*, 2005;28 Suppl 1:S72-9.
7. Funnell MM, Brown TL, Childs BP, Haas LB, Hoseney GM, Jensen B, et al. National Standards for diabetes self-management education. *Diabetes Care*, 2011;34 Suppl 1:S89-96.
8. Polikandrioti M. The role of education in diabetes mellitus type 2 management. *Health Science Journal*, 2010;4(4):201-202.
9. Miller DK, Fain JA. Diabetes self-management education. *Nurs Clin North Am*. 2006;41(4):655-66.
10. Lin D, Hale Sh, Kirby E. Improving diabetes management. Structured clinic program for Canadian primary care. *Can Fam Physician*. 2007;53(1): 73–77.
11. Schwarz P, Cruhl U, Bornstein St, Landgraf R, Hall M, Tuomilehto J. The European perspectives on Diabetes Prevention : development and implementation of a European Guideline and training standards for Diabetes prevention. *Diabetes Vasc Dis Res*. 2007;4: 353-57.
12. Shojania KG, Ranji SR, McDonald KM, Grimshaw JM, Sundaram V, Rushakoff RJ, Owens DK. Effects of quality improvement strategies type 2 diabetes on glycemic control: a meta-regression analysis. *JAMA*. 2006;296(4):427-40.

13. Kirkman MS, Williams SR, Caffrey HH, Marrero DG. Impact of a program to improve adherence to diabetes guidelines by primary care physicians. *Diabetes Care*, 2002;25(11):1946–51.
14. Williams GC, Zeldman A. Patient-centered diabetes self-management education. *Curr Diab Rep*. 2002;2(2):145-52.
15. Berger M, Móhlhauser I. Diabetes care and patient-oriented outcomes. *JAMA*.1999;281(18):1676–8.
16. Polikandrioti M, Ntokou M. Needs of hospitalized patients. *Health Science Journal*, 2011;5(1):15-22
17. Polikandrioti M, Kalogianni A. The contribution of education to the control of Diabetes Mellitus, type II. *Vima Asklipiou*. 2008;7(2):152-161 (In Greek)
18. Halimi S. Therapeutic strategies for type 2 diabetes. *Rev Prat*. 2003;53(10):1079-85.
19. Harris SB, Petrella RJ, Leadbetter W. Lifestyle interventions for type 2 diabetes. Relevance for clinical practice. *Can Fam Physician*. 2003;49:1618-25
20. Polikandrioti M. Exercise and diabetes mellitus. *Health science Journal*, 2009;3(3):130-131.
21. Brunton S. Implementing treatment guidelines for type 2 diabetes in primary care. *Postgrad Med*. 2009;121(2):125-38
22. Duke SA, Colagiuri S, Colagiuri R. Individual patient education for people with type 2 diabetes mellitus. *Cochrane Database Syst Rev*. 2009;(1):CD005268
23. 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*. 2005;(2):CD003417.
24. Foster G, Taylor SJ, Eldridge SE, Ramsay J, Griffiths CJ. Self-management education programmes by lay leaders for people with chronic conditions. *Cochrane Database Syst Rev*. 2007;(4):CD005108.
25. Tessier DM, Lassmann-Vague VJ. Diabetes and education in the elderly. *Diabetes Metab*. 2007;33 Suppl 1:S75-8
26. Rutten G. Diabetes patient education: time for a new era. *Diabet Med*. 2005;22:671-3.