Review Article

Psychosocial concerns among patients with diabetes attending the preanesthetic and pain clinic

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ABSTRACT

Diabetes is a global health problem that is expected to affect double the population by next decade as compared to those affected at present. In spite of the improved, efficacious and newer modalities available to achieve adequate control of the disease, psychosocial issues like depression and anxiety, which may present in the preanesthetic/pain clinics with varied symptomatology and commonly affects these patients, are often overlooked. The impact of these issues is enormous and usually understated because of the fact that health care providers are not aware of these issues and its effect on the overall management of diabetes. Therefore, it is important to recognize and address these issues for the optimal management of the disease. Of equal importance is the development of educational teaching modules for self-care management while imparting training to health care providers at the same time to recognize the susceptible individuals at the earliest. The need for having multi-disciplinary approach and implementation of the same in the day to day practice cannot be overemphasized.

Key words: Depression, diabetes, pain clinic, preanesthetic, psychosocial issues

Introduction

Diabetes is a global health problem that is expected to affect 552 million people by 2030.[1] Although new, more efficacious and improved delivery systems to treat diabetes have been developed, majority of these patients do not achieve an optimal blood glucose control thus affecting the mortality and morbidity of the patient.

That diabetes is associated with number of co morbid condition involving almost all the body systems is a well-known fact. However, it is one of the most psychologically demanding chronic medical illnesses, the fact that is often understated or ignored. What is more interesting to note is that diabetics have a higher tendency to develop psychosocial problems that are probably attributed to the chronicity of the disease.[2] One of the lesser known facts is that underlying psychological or neurocognitive problems may contribute significantly to the poor compliance to the medical treatment and poor glycemic control thus contributing to increase in morbidity and increased length of stay thereby increasing inpatient cost as well.[3,4] The importance of emotional issues was first noted over 300 years ago by Thomas Willis in 1674 who claimed that underlying extreme sorrow led to the development of diabetes.[5]

Diabetes-related comorbidities increase the need to undergo surgical procedures and at least 10% of the patients undergoing major surgical procedures usually have diabetes and its related complications. All the patients with diabetes need to undergo a comprehensive preanesthetic (PAC) checkup or may frequent the pain outpatient department, owing to peripheral neuropathy that affects 30-50% of patients with diabetes and places them at increased risk of heel ulceration, particularly if peripheral vascular disease is also present.[6] The literature was searched at the electronic database PubMed using the MeSH words "Psychosocial issues in diabetes" that

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revealed total of 195 results. It revealed 12 clinical trials and 34 review articles in humans over the last 10 years. Further studies were identified with cross references and citations. Only peer-reviewed articles in English language were included in the present article. The psychosocial concerns are especially related to PAC clinic and pain clinic were not addressed. Therefore, the present review intends to focus on the psychosocial concerns that are prevalent in patients with diabetes and provide an insight on the relationship of the same with the perioperative/ periprocedural outcomes.

Psychosocial Concerns in Diabetic Population

Diabetes being the most challenging and demanding of all the chronic illnesses and with the number of diabetic patients expected to increase substantially over the next decade; it prioritizes the top of health care pyramid. Although several evidence-based guidelines are available for the management of diabetes per say, the psychosocial concerns pertaining to diabetes are ill focused. With acknowledgment of the fact that psychosocial play an important role in the treatment of patients with diabetes; several guidelines have been endorsed by national and international bodies which now include the psychosocial concerns as an integral part of the existing clinical practice.

The American Association of Clinical Endocrinologists, The Scottish Intercollegiate Guideline Network, American Diabetes Association and International Society for Pediatric and Adolescent Diabetes and European countries has incorporated specific guidelines and made recommendations for the treatment of psychological disorders and directing therapy so as to preserve the psychosocial well-being in patients with diabetes.[7-11]

Over the last few years, the focus of underlying mechanism of suboptimal blood sugar control has moved from the medical aspects to the psychosocial aspects and effects.[12]

The most comprehensive study of psychosocial issues in diabetes is the Diabetes Attitudes, Needs and Wishes study (DAWN). The DAWN study was a global psychosocial diabetes study which addressed the perceptions and attitudes of >5,000 adults with diabetes and over 3,000 healthcare professionals involved in the provision of diabetes care in 13 different countries.[13] While original DAWN study revealed association of number of psychological problems associated with diabetes affecting the glycemic control and quality of life, DAWN2 highlighted that the healthcare professionals lack adequate training and resources to provide the psychological support which is the key aspect in the management of the disease.[14,15] Psychological issues hamper the adequate control of the disease and subsequently increase the incidence of late complications of diabetes.[16-18] All the complications lead to physical restriction to a certain extent, thereby affecting the quality of life negatively and initiating a vicious cycle of chronic stress with negative influence on the treatment compliance and the outcomes of the disease.

Children and adolescents

The incidence of both insulin-dependent diabetes mellitus (IDDM) and noninsulin dependent diabetes mellitus has increased manifold over the last few years. Diabetes imposes considerable demands on the children and their families. In addition to coping up with the developmental challenges of childhood and adolescence, the additional intensive management of optimal blood sugar control may put more burdens on children. Evidence indicates that IDDM is a risk factor for the development of psychiatric disorder in children. Diabetes can affect both psychological and neurocognitive functioning, thus affecting the quality of life of the child. Most of the children have adjustment problems with the diagnosis of diabetes that usually resolve over a period of 1-year. One-third of the adolescents diagnosed with diabetes have a psychiatric disorder, most of them involving the internalizing symptoms. Diabetic children also have a higher incidence of depression that further leads to poor glycemic controls.[19-21] Adolescent girls are particularly at risk of developing eating disorders which is further associated with poor metabolic control.

Children developing diabetes before 5 years with frequent hypoglycemic episodes are at higher risk of developing the neurocognitive deficits particularly in visual spatial functioning. Also, these children have a higher tendency to miss the school and have lower reading achievement as compared to their peer group and are likely to have more learning problems. They also have poor attention span and lower verbal intelligence which is more so in children experiencing frequent hypoglycemic episodes. They may also exhibit neuropsychological deficits including reduced speed of information processing and decrease in the conceptual reasoning and acquisition of new knowledge that is prevalent with both hypoglycemic and hyperglycemic episodes.[22]

Adults

Diabetes is a progressive metabolic disorder involving multiple organ systems. Diabetes is a psychologically and behaviorally demanding disease, and the psychosocial impact has been recognized as a strong predictor of mortality in diabetic patients than many other clinical

and physiological variables. The prevalence of psychiatric disorders, particularly, the affective and anxiety disorders in adults has been well documented. Depression in diabetics is at least three times more common than in the general population and is associated with higher mortality as compared to diabetics with no depressive symptoms.[23-25] The association of depression with diabetes with association of 10 fold increases in suicidal tendencies.[26] While some studies show the correlation of increasing age with depression in patients with diabetes, many other fail to support the same.[27-31] Depression is also more common in females than men and may be due to influence of estrogen hormones.[31-35] Patients receiving antidepressants may exhibit side effects such as weight gain, sedation and effects on the cardiovascular system. Atypical antipsychotics can worsen the glycemic control even in patients without a preexisting diagnosis of diabetes.[36,37] Selective serotonin re uptake inhibitors (SSRI's) are most commonly employed for depressive symptoms owing to their safety profile but may be associated with weight loss and hypoglycemia. Therefore, the omission of the dose before surgery or any procedure that requires fasting, may be necessary.[38,39]

Apart from depression several psychiatric disorders may be associated with diabetes. Schizophrenia, generalized anxiety disorders, phobias, personality disorders and cognitive dysfunction may be encountered in diabetes.[3]

Clinical features of anxiety disorders such as sweating, tremors, anxiety, tachycardia and confusion may be present in the patient with diabetes that needs to be differentiated from hypoglycemia or other co morbid conditions.[40] The phobias of needles and pin pricks may further worsen the anxiety disorders and need psychological reassurance. The patients may be receiving benzodiazepines (BDP's), beta blockers or SSRI's for the anxiety disorders. Sedating agents should be used cautiously in case patient is receiving BDP's and dosage of the induction agents need to be titrated accordingly.

Anorexia nervosa and bulimia is predominant in type I diabetes and usually occurs in young women and onset of diabetes usually precedes the onset of the eating disorders.[41] Both the conditions have harmful sequel with patients usually omitting or intentionally decreasing the insulin dosages to reduce the weight resulting in acute hyperglycemic states and ketoacidosis with resultant increased risk of complications. Young patients with diabetes with frequent episodes of diabetic ketoacidosis over a short span of time (brittle diabetes) should undergo a detailed emotional and psychological well-being assessment.[42] Sexual problems, visual impairment, peripheral vascular disease, neuropathy, coronary artery disease, and renal insufficiency are more common among people with diabetes; and all the factors are likely to contribute to the development of the psychological problems.[43] Referral to a mental health specialist is indicated in the presence of gross inability to treatment adherence, self-harm, eating disorder or cognitive impairment that affects the judgment of the patient. Psychological interventions may improve glycosylated A1 and mental outcomes significantly.

Tobacco and alcohol abuse are also associated with poor glycemic control as well as increased complications. Consumption of alcohol may be associated with fasting hyperglycemia or reactive hypoglycemia, potentiation of drug induced hypoglycemia, synergistic effects on the peripheral neuropathy.[3]

Quality of life

The World Health Organization defines quality of life as "the individual's perception of their position of life, in the context of the cultural and value systems in which they live in relation to their goals, expectations, standards and concerns.[44] This broad definition incorporates the multi-dimensional concepts of the person's physical health, psychological state, level of independence, social relationships, personal beliefs and their environment. Quality of life was rated poor or very poor by 13.9% of participants in DAWN2 study with wide variations between the countries (7.6% in Denmark to 29.3% in Japan). Diabetes had a negative impact on all domains investigated, including physical health (62.2%), emotional well-being (46.2%), finances (44.0%), leisure and work activities (38.2% and 35.4% respectively) and relationships with family or friends (20.5%). A high proportion of people affected with diabetes also reported poor quality of life (12.2%). In India, patients with diabetes have the lowest level of psychological well-being on World Health Organization-5 (WHO-5) well-being index. The patients also demonstrated significantly higher perception of burden of social and personal distress related to diabetes.[11,45]

Patients with diabetes often need a complex set of services and support ranging from glucose monitoring, insulin and other medication management, psychotherapy and social support to physical activity promotion, nutrition counseling and many other aspects. All the factors have considerable influence on attitude and thinking of the patient when they are scheduled to undergo a surgical or interventional procedure.

Role of family

Family members and dynamics play an important role in assisting a person with diabetes to manage their own care.[46-48] Psychosocial problems of family members are barriers to their effective involvement in self-management, but current healthcare systems are poorly equipped to provide support or education to the families of people with diabetes.[11] DAWN2 provides benchmarking indicators of family members' psychosocial needs that help identify the support required for, and from, and to improve the lives of people with diabetes and their families.[49]

Since family members are concerned about the long-term complications of diabetes in their near and dear ones, the current evidence is in favor of improved psychosocial support and informed involvement of the family members which in turn is an important aspect in overall management and care of the patient. Family involvement has a key role in the management of diabetes, with little or support from the family being associated with lack of medication adherence and diabetic care behavior.[50] DAWN2 revealed that although family support is available in most of the cases in all the countries, support from broader community care is scarce. Low levels of family conflict and stress, high levels of cohesion and organization, good communication skills and involvement of both the parents in the management of diabetes have been associated with better metabolic control and regimen adherence.

Role of health care provider

As far as the health care providers are concerned, most of them are not able to identify and evaluate the psychological problems and provide the psychological support much required at the time of presentation in the PAC checkup clinics or pain clinics.

Symptoms related to anxiety disorders must be observed in the PAC evaluation. History of frequent hypoglycemia or hyperglycemia episodes must be sought. If present, neurocognitive dysfunction must be ruled out in association with hypoglycemia. Frequent hyperglycemia or diabetic ketoacidosis warrants detailed psychological assessment. Especially in terms of anxiety, they experience higher levels of posttraumatic stress disorder[51] and health anxiety. In all the patients, preoperative fasting should be discussed in detail and frequent monitoring should be planned especially where hypoglycemia is frequent and associated with neurocognitive effects.

Most of these patients have fear or needles, and special attention should be paid to adults with Type I diabetes with visual or psychological needs. An effort should be made to provide injection devices or needle free systems that can be utilized for optimal glycemic control.[42]

In addition, patients with underlying psychiatric disturbances may have to under electroconvulsive therapy as a part of their medical treatment. The possibility of worsening/amelioration of the hyperglycemic state should be kept in mind.[52]

As earlier mentioned, patients with diabetes need to be evaluated for the medications prescribed for psychological disorders and preemptive treatment plan ought to be discussed and formulated before undertaking any procedure.

Painful diabetic neuropathy is the most common cause of neuropathic pain (72%) which may be moderate to severe and adversely affects the quality of life of patients with diabetes. It is often associated with mood disorders and the patients' needs to be counseled for any intervention.[53] The fear of inadvertent complications and repeated visits needs to be addressed. The underlying pathogenesis of transition of acute pain to chronic pain is still an enigma. Therefore, all behavioral problems may be related with the acute or chronic conditions or both. Patients with neuropathic pain and psychological co morbidities often cause a diagnostic dilemma and require additional treatments to optimize the outcomes.[54] The psychological problems can exacerbate the intensity and severity of pain, course of the disease, patient's adaptation and response to the treatment. Improved collaboration within a multi-disciplinary team of healthcare professionals is, therefore, an important factor in improving outcomes for these patients.[55,56] These patients should be managed with a multimodal approach rather than individual therapies.

A "patient-centered" approach to diabetes care, which emphasizes the individual's role as part of the treatment team, is essential for achieving optimal outcomes and patient satisfaction while a multi-disciplinary healthcare professional approach from the beginning encourages healthcare professionals to improve the delivery of care.[57,58]

With the development of sophisticated diabetic protocols and devices available for the same, information technology can also help improve outcomes for patients. The best internet self-management education and support programs are rich in pertinent content, provide engaging interactive elements, and offer a tailored, personalized learning experience. Web-based learning and support technology benefits both clinician and patient; patients learn to overcome barriers and to self-document activities and interactions, permitting clinician review and feedback

at any time. In addition, the clinician can communicate frequently and efficiently, offering personalized E-mail support to each patient without requiring in-person meetings, as well as monitor "virtual support groups" where patients interact with others online via informational chat rooms and blogs. By incorporating web-based patient self-management and support into traditional treatment methods, one clinician can effectively support many patients.[59]

Integrated health care

Psychosocial concerns during the PAC evaluation and in pain clinics have not been discussed in details in literature. DAWN revealed that insufficient care and support was available to meet the psychological and educational needs of people with diabetes and their healthcare professionals in both developed and developing countries.[60] There is a difference in the perception of the care between people having diabetes and the health care professionals and poor co-ordination amongst the health care professionals and the organizations remains an impediment to the optimal management of diabetes and its associated psychological sequel.[61]

The DAWN study has confirmed the importance of several factors aimed at improving the health and life quality for people living with diabetes as in Table 1.

The DAWN findings support a paradigm shift from acute care model to the person centered, integrated chronic care model as WHO Innovative care for chronic care framework to Diabetes.[38] It is recommended that the therapeutic education should be patient-centered continuous process. It should enable the person and its families to achieve the optimal blood sugar control and maintain the abilities on the day to day basis.

The organized educational sessions should be well structured and include modules on self-care learning and psychosocial support, regarding the course of the disease, treatment and organizational information on health and illness behavior. The aim of the education is to assist the patients and their families to understand the disease and cooperate amongst themselves and with the health care providers to achieve maximal therapeutic benefit and cost effectiveness. Since psychological factors remain barriers to the outcome of the disease, there is a need to design the health care services that integrate and provide the essential psychosocial services as well. Screening the patients in outpatient department seems to be a good option but evidence has shown that imparting training to the providers does not help in detecting underlying depression. Integration of the psychologists, mental health physicians and psychiatric consultations into the diabetic health care team may also provide tremendous help.

It is important to remember that treating diabetes is often time consuming and has significant financial impact on the health care system.[62,63] Optimal diabetic care is best achieved with the collaboration of persons having diabetes, family members, community partners and health care providers and teams that are informed, motivated and ready to work together for good outcomes.

Various strategies that have been put forward to improve the diabetic care include:

1. Raising awareness of the diabetic patients perspective.
2. Imparting information and education to the diabetic patients for optimal control of the disease.
3. Training of health care providers.
4. Improvement of policies and guidelines for a person centered care.

In addition to the educational programs, people with diabetes should receive diabetes self-management education (DSME) and diabetes self-management support (DSMS) according to National Standards for Diabetes self-management Education and Support when their diabetes is diagnosed and as needed thereafter. DSME is associated with improved knowledge and self-care behavior, improved clinical outcomes such as lower A1C, lower self-reported weight, improved quality of life, healthy coping and lower costs. Both individual and group approaches were found to be effective, and it was associated with more use of primary and preventive health care services.[64]

Collaborative, multi-disciplinary teams are the need of an hour to provide care for people with chronic conditions such as diabetes and to facilitate patient performance of appropriate self-management.

Health care providers should prioritize timely and appropriate intensification of lifestyle and therapy of the patients who fail to achieve desired levels of control

Table 1: Important factors to improve the health and quality of life in people with diabetes

Enhancement of communications between people with diabetes and healthcare providers
Promotion of team-based diabetes care
Promotion of active self-management
Overcoming emotional barriers to effective therapy to enable better psychological care for people with diabetes

with the self-management strategies. Health care provider should follow the evidence based practices and integrate it with the clinical tools available at their centers. The care management teams should incorporate nurses, pharmacists and physiotherapists to effectively manage the course and complications of the disease itself. In addition, successful management of the psychosocial elements of the disease requires a systematic approach to supporting the patient's behavior that includes addressing the emotional concerns, incorporating healthy lifestyle, self-management of the disease and its complications and thus incorporating a quick referral system whenever required. It is also important to engage community resources and form public policies to support the people with diabetes.

Conclusion

Psychosocial problems though common in diabetic individuals, are often overlooked or missed at the health care settings. Evidence shows that behavioral sciences development is making an insight to these factors in both children and adult forms an integral role in the perioperative management of diabetes. Therefore improved professional communication along with strengthening of the education and training programs at the community as well as health care systems and implementation of the same in day to day care is mandatory for the successful outcome of the disease.

References

1. International Diabetes Federation. Diabetes Atlas. 5th ed. 2012. Available from: http://www.idf.org/diabetesatlas/. [Last accessed on 2014, May 8].
2. Bajwa SS, Sehgal V. Psycho-social and clinical aspects of diabeto-criticare. J Soc Health Diabetes 2013;1:70-4.
3. Kota SK, Meher LK, Jammula S, Krishna SV, Kota SK, Modi KD. Neuropsychiatric screening in type 2 diabetes mellitus. Indian J Endocrinol Metab 2012;16 Suppl 1:S37-40.
4. Moghissi ES, Korytkowski MT, Dinardo MM, Hellman R, Hirsch IB, Inzucchi S, *et al*. American Association of Clinical Endocrinologists and American Diabetes Association consensus statement on inpatient glycemic control. Diabetes Care 2009;32:1119-31.
5. Rubin RR, Peyrot M. Was Willis right? Thoughts on the interaction of depression and diabetes. Diabetes Metab Res Rev 2002;18:173-5.
6. Gordois A, Scuffham P, Shearer A, Oglesby A, Tobian JA. The health care costs of diabetic peripheral neuropathy in the US. Diabetes Care 2003;26:1790-5.
7. Handelsman Y, Mechanick JI, Blonde L, Grunberger G, Bloomgarden ZT, Bray GA, *et al.* American Association of Clinical Endocrinologists Medical Guidelines for Clinical Practice for developing a diabetes mellitus comprehensive care plan. Endocr Pract 2011;17 Suppl 2:1-53.
8. Scottish intercollegiate guidelines network. Sign 55. Management of diabetes, 2001. Available from: http://www.sign.ac.uk. [Last accessed on 2014, May 8].
9. American Diabetes Association. Standards of medical care in diabetes. Diabetes Care 2005;28:S4.
10. ISPAD. Consensus guidelines for the management of type 1 diabetes mellitus in children and adolescents, 2000. Available from: http://www.diabetesguidelines.com/health/dkw/pro/guidelines/ispad/ispad/asp. [Last accessed on 2014, May 8].
11. 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. Diabet Med 2005;22:1379-85.
12. Serrano-Gil M, Jacob S. Engaging and empowering patients to manage their type 2 diabetes, Part I: A knowledge, attitude, and practice gap? Adv Ther 2010;27:321-33.
13. Skovlund S. Diabetes attitudes, wishes and needs. Diabetes Voice 2004;49:4-11.
14. Holt RI, Kalra S. A new DAWN: Improving the psychosocial management of diabetes. Indian J Endocrinol Metab 2013;17:S95-9.
15. Holt RI, Niccolucci A, Burns KK, Escalante M, Forbes A, Herman M, *et al*. Research: educational and psychological issues diabetes attitudes, wishes and needs second study (DAWN2TM): Cross-national comparisons on barriers and resources for optimal care-healthcare professional perspective. Diabet Med 2013;30:789-98.
16. Leppävuori A. Depression and diabetes. Duodecim 2010;126:521-7.
17. Bajwa SJ, Jindal R, Kaur J, Singh A. Psychiatric diseases: Need for an increased awareness among the anesthesiologists. J Anaesthesiol Clin Pharmacol 2011;27:440-6.
18. Pyatak EA, Sequeira P, Peters AL, Montoya L, Weigensberg MJ. Disclosure of psychosocial stressors affecting diabetes care among uninsured young adults with Type 1 diabetes. Diabet Med 2013;30:1140-4.
19. Grey M, Whittemore R, Tamborlane W. Depression in type 1 diabetes in children: Natural history and correlates. J Psychosom Res 2002;53:907-11.
20. Stewart SM, Rao U, White P. Depression and diabetes in children and adolescents. Curr Opin Pediatr 2005;17:626-31.
21. Corathers SD, Kichler J, Jones NH, Houchen A, Jolly M, Morwessel N, *et al.* Improving depression screening for adolescents with type 1 diabetes. Pediatrics 2013;132:e1395-402.
22. Hannonen R, Tupola S, Ahonen T, Riikonen R. Neurocognitive functioning in children with type-1 diabetes with and without episodes of severe hypoglycaemia. Dev Med Child Neurol 2003;45:262-8.
23. Lustman PJ, Anderson RJ, Freedland KE, de Groot M, Carney RM, Clouse RE. Depression and poor glycemic control: A meta-analytic review of the literature. Diabetes Care 2000;23:934-42.
24. de Groot M, Anderson R, Freedland KE, Clouse RE, Lustman PJ. Association of depression and diabetes complications: A meta-analysis. Psychosom Med 2001;63:619-30.
25. Lin EH, Katon W, Von Korff M, Rutter C, Simon GE, Oliver M, *et al.* Relationship of depression and diabetes self-care, medication adherence, and preventive care. Diabetes Care 2004;27:2154-60.
26. Sotiropoulos A, Papazafiropoulou A, Apostolou O, Kokolaki A, Gikas A, Pappas S. Prevalence of depressive symptoms among non insulin treated Greek type 2 diabetic subjects. BMC Res Notes 2008;1:101.
27. Nasser J, Habib F, Hasan M, Khalil N. Prevalence of depression among people with diabetes attending diabetes clinics at primary health settings. Bahrain Med Bull 2009;31:1-7.
28. Rahman M, Rahman MA, Flora MS, Rakibuz-Zaman M. Depression and associated factors in diabetic patients attending

an urban hospital of Bangladesh. Int J Collab Res Intern Med Public Health 2011;3:65-76.
29. Lloyd CE, Dyer PH, Barnett AH. Prevalence of symptoms of depression and anxiety in a diabetes clinic population. Diabet Med 2000;17:198-202.
30. Larijani B, Bayat MK, Gorgani MK, Bandarian F, Akhondzadeh S, Sadjadi SA. Association between depression and diabetes. Ger J Psychiatry 2004;7:62-5.
31. Anderson RJ, Freedland KE, Clouse RE, Lustman PJ. The prevalence of comorbid depression in adults with diabetes: A meta-analysis. Diabetes Care 2001;24:1069-78.
32. Roupa Z, Koulouri A, Sotiropoulou P, Makrinika E, Marneras X, Lahana I, *et al.* Anxiety and depression in patients with type 2 diabetes mellitus, depending on sex and body mass index. Health Sci J 2009;3:32-40.
33. Culbertson FM. Depression and gender. An international review. Am Psychol 1997;52:25-31.
34. Lee HJ, Chapa D, Kao CW, Jones D, Kapustin J, Smith J, *et al.* Depression, quality of life, and glycemic control in individuals with type 2 diabetes. J Am Acad Nurse Pract 2009;21:214-24.
35. Shobhana R, Rama Rao P, Lavanya A, Padma C, Vijay V, Ramachandran A. Quality of life and diabetes integration among subjects with type 2 diabetes. J Assoc Physicians India 2003;51:363-5.
36. Philip NS, Carpenter LL, Tyrka AR, Price LH. Augmentation of antidepressants with atypical antipsychotics: A review of the current literature. J Psychiatr Pract 2008;14:34-44.
37. Haddad PM, Sharma SG. Adverse effects of atypical antipsychotics: Differential risk and clinical implications. CNS Drugs 2007;21:911-36.
38. MacGillivray S, Arroll B, Hatcher S, Ogston S, Reid I, Sullivan F, *et al.* Efficacy and tolerability of selective serotonin reuptake inhibitors compared with tricyclic antidepressants in depression treated in primary care: Systematic review and meta-analysis. BMJ 2003;326:1014.
39. Markowitz SM, Gonzalez JS, Wilkinson JL, Safren SA. A review of treating depression in diabetes: Emerging findings. Psychosomatics 2011;52:1-18.
40. Balhara YP. Diabetes and psychiatric disorders. Indian J Endocrinol Metab 2011;15:274-83.
41. Mannucci E, Rotella F, Ricca V, Moretti S, Placidi GF, Rotella CM. Eating disorders in patients with type 1 diabetes: A meta-analysis. J Endocrinol Invest 2005;28:417-9.
42. National Institute of Clinical Excellence (NICE) guidelines. Diabetes; 2004. Available from: http://www.guidance.nice.org.uk/cg15. [Last accessed on 2014, May 8].
43. Bajwa SJ, Kalra S. Diabeto-anaesthesia: A subspecialty needing endocrine introspection. Indian J Anaesth 2012;56:513-7.
44. Study protocol for the World Health Organization project to develop a Quality of Life assessment instrument (WHOQOL). Qual Life Res 1993;2:153-9.
45. Kalra S, Sridhar GR, Balhara YP, Sahay RK, Bantwal G, Baruah MP, *et al.* National recommendations: Psychosocial management of diabetes in India. Indian J Endocrinol Metab 2013;17:376-95.
46. Rintala TM, Jaatinen P, Paavilainen E, Astedt-Kurki P. Interrelation between adult persons with diabetes and their family: A systematic review of the literature. J Fam Nurs 2013;19:3-28.
47. Barnard KD, Peyrot M, Holt RI. Psychosocial support for people with diabetes: Past, present and future. Diabet Med 2012;29:1358-60.
48. Rosland AM, Heisler M, Choi HJ, Silveira MJ, Piette JD. Family influences on self-management among functionally independent adults with diabetes or heart failure: Do family members hinder as much as they help? Chronic Illn 2010;6:22-33.
49. Burns KK, Nicolucci A, Holt RI, Willaing I, Hermanns N, Kalra S, *et al*. Research: Educational and psychological issues diabetes attitudes, wishes and needs second study (DAWN2TM): Cross-national benchmarking indicators for family members living with people with diabetes. Diabet Med 2013;30:778-88.
50. Mayberry LS, Osborn CY. Family support, medication adherence, and glycemic control among adults with type 2 diabetes. Diabetes Care 2012;35:1239-45.
51. Lukaschek K, Baumert J, Kruse J, Emeny RT, Lacruz ME, Huth C, *et al.* Relationship between posttraumatic stress disorder and type 2 diabetes in a population-based cross-sectional study with 2970 participants. J Psychosom Res 2013;74:340-5.
52. Netzel PJ, Mueller PS, Rummans TA, Rasmussen KG, Pankratz VS, Lohse CM. Safety, efficacy, and effects on glycemic control of electroconvulsive therapy in insulin-requiring type 2 diabetic patients. J ECT 2002;18:16-21.
53. IndINeP Study Group. Burden of neuropathic pain in Indian patients attending urban, specialty clinics: Results from a cross sectional study. Pain Pract 2008;8:362-78.
54. Turk DC, Audette J, Levy RM, Mackey SC, Stanos S. Assessment and treatment of psychosocial comorbidities in patients with neuropathic pain. Mayo Clin Proc 2010;85:S42-50.
55. Murphy K, Casey D, Dinneen S, Lawton J, Brown F. Participants' perceptions of the factors that influence diabetes self-management following a structured education (DAFNE) programme. J Clin Nurs 2011;20:1282-92.
56. Bajwa SJ, Kalra S. Endocrine anesthesia: A rapidly evolving anesthesia specialty. Saudi J Anaesth 2014;8:1-3.
57. Rasekaba TM, Graco M, Risteski C, Jasper A, Berlowitz DJ, Hawthorne G, *et al.* Impact of a diabetes disease management program on diabetes control and patient quality of life. Popul Health Manag 2012;15:12-9.
58. American Association of Clinical Endocrinologists (AACE). Diabetes care plan guidelines. Endocr Pract 2011;17:1-53.
59. Kaufman N. Internet and information technology use in treatment of diabetes. Int J Clin Pract Suppl 2010;41-6.
60. Skovlund SE, Peyrot M. The diabetes attitudes, wishes, and needs (DAWN) program: A new approach to improving outcomes in diabetes care. Diabetes Spectr 2005;18:136-42.
61. Beaser RS, Okeke E, Neighbours J, Brown J, Ronk K, Wolyniec WW. Coordinated primary and specialty care for type 2 diabetes mellitus, guidelines, and systems: An educational needs assessment. Endocr Pract 2011;17:880-90.
62. Bajwa SJ, Kalra S. A deeper understanding of anesthesiology practice: The biopsychosocial perspective. Saudi J Anaesth 2014;8:4-5.
63. Beverly EA, Hultgren BA, Brooks KM, Ritholz MD, Abrahamson MJ, Weinger K. Understanding physicians' challenges when treating type 2 diabetic patients' social and emotional difficulties: A qualitative study. Diabetes Care 2011;34:1086-8.
64. American Diabetes Association. Standards of medical care in diabetes-2013. Diabetes Care 2013;6:S11-66.

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