

Improving diabetes Management strategies in family medicine practice: Review

Authors:

Mereehan Faisal Saud Alqurashi
Badeah Ayesah Ahmad Alsofyani
Nawal Swailem Rasheed Alotaibi
Faizah Abdullah Saleh Alghamdi
Badeah Ayesah Ahmad Alsofyani

Abstract: This narrative review was conducted to evaluate the strategies that could have improved the family physician's roles in management of diabetic patients, we intended to discuss the most efficient strategies in management of diabetes in primary care from different studies of different population from the world. Narrative review was conducted using electronic database such as; PubMed/Medline, Embase, Google scholar, for relevant articles related to our concerned topic which is about the management of diabetes in primary care and methods to improve those strategies. Poor diabetic patient's management usually because of Family physicians in primary care are not adhered to guidelines. Much evidence supports quality-improvement interventions for diabetes management to increase physicians' adherence to guidelines and to improve patient outcomes, as well as the education and social support of these patients might help family doctors to improve their management strategies toward diabetic patients. Also the introduction of a multicomponent methods as telemedicine intervention in community primary care practices significantly improves the management approaches of diabetes.

Introduction:

Diabetic issues are a complicated health problem that results in significant morbidity and mortality and healthcare source usage ^(1, 2, 3). With projected boosts in the occurrence of diabetes mellitus worldwide, wellness systems continue to concentrate on improving as well as optimizing diabetes mellitus treatment by affecting patient behavior and boosting effectiveness of care ^(1, 2, 3).

In 2002, browse through to medical care physicians accounted for 62.7% of all workplace browse through in the United States, and also diabetes mellitus ranked 3rd, accounting for 3.1% of illness-related medical diagnoses ⁽⁴⁾. Patients with type 2 diabetic issues typically have intense or persistent comorbid health problems that force the clinician to focus on as well as resolve the most pressing or symptomatic problems first ^(5,6). The achievement of evidence-based professional goals substantially minimizes the danger of morbidity as well as death in type 2 diabetic issues, the delivery of care in community techniques and reference centers frequently drops brief of these objectives ^(7,8). The demand to boost diabetic issues services in the U.S. is well documented, couple of scientific treatments have been shown to successfully boost person outcomes in diverse primary care settings ⁽⁹⁾. Due to the fact that > 80% of grownups with diabetes mellitus receive their treatment from medical care physicians, the neighborhood primary care method is a logical focal point for executing approaches that boost care shipment. Practical treatment strategies are needed to ensure

that the most recent and also most reliable scientific referrals for diabetic issues care are rapidly meant the area ^(10,11).

Effective management of people with diabetes could reduce the problems connected with the disease ^(12,13). Current standards for ideal management of these individuals need a multi-disciplinary technique in which family physicians are the major team members in charge of coordinating correct, timely care ^(12,13). In active health care techniques, it is usually challenging to abide by these standards, however this may be because there is no orderly technique to care ^(14,15).

Lots of treatments have actually been made use of in initiatives to improve physicians' adherence to suggestions for diabetes treatment as well as, as a result, to enhance individual outcomes. These treatments have actually consisted of steering committees; devoted diabetic person clinics; education and learning for care providers; client education and learning as well as self-management methods; nutrition counseling; use nurses adhering to methods; digital surveillance and preparation; revamped workplace systems; cluster visits including

situation supervisors, psycho therapists, nutritional experts, pharmacologists, and doctor experts; doctor audits; performance motivations; as well as use flow sheets ^(16,17,18). Such treatments have often improved the process of treatment, client outcomes, or both ^(19,20).

Many diabetes treatment research studies are limited by insufficient sample size, nonrandomized individuals as well as facilities, lack of control subjects, or minimal scope of application within a single clinical group or health and wellness system ^(21,22). Although some tests of top quality improvement techniques have actually shown small renovations while treatment distribution.

This narrative review was conducted to evaluate the strategies that could have improved the family physician's roles in management of diabetic patients, we intended to discuss the most efficient strategies in management of diabetes in primary care from different studies of different population from the world.

Methodology:

Narrative review was conducted using electronic database such as; PubMed/Medline, Embase, Google scholar, for relevant articles related to our concerned topic which is about the management of diabetes in primary care and methods to improve those strategies.

Restriction were applying to only English language articles with human subject.

Discussion:

o **Telecommunication systems as an improving method for diabetic patient management in primary care:**

These interventions contained the transmission of blood glucose values by individuals by means of mobile phone and computer system, to doctor for testimonial, with comments to clients by phone, videoconference, or other electronic methods. 2 reviews addressed treatments targeted just to children and also young people ^(23,24). 3 reviews described a system user interface where information were transferred to a remote web server for analysis, after which appropriate automatic messages or suggestions were sent to clients or their carriers ^(25,26,27).

The treatments focused on boosting diabetes take care of patients with Type 1 diabetes mellitus focused on using a telecommunication system to help in outpatient administration of these clients. Among the two research studies ⁽²⁸⁾ where this treatment was examined was mediocre. The other study was the only research study in the evaluation that just included paediatric

patients⁽²⁹⁾. Therefore, it is still difficult to reason concerning the effectiveness of this treatment technique.

This specifically crucial because loss to follow-up carries an enhanced danger of diabetes issues. Central computerized systems can be of added value as they could provide responses to providers as well as can likewise produce reminders to service providers for management of their individuals. In a simple reputable method data could be obtained to determine enhancements in the performance of care providers as well as individual outcomes^(28,29).

All posts we included in this review, reported on the medical performance of the interventions on glycaemic control in clients. Telemedicine interventions improved HbA1c levels in eight evaluations^(23,24,25,30,31,32,33,34), as well as 3 reviews had blended outcomes^(26,33,35). Where assesses checked out different settings of information transmission, it was found that short message system (SMS), when made use of alone or in conjunction with the Internet to supply house glucose documents and assistance, were usually connected with enhanced glycaemic control in clients⁽²⁴⁾. Net as a main ways of transmission of blood sugar information and also support likewise had a favorable result on glycaemic control⁽²⁴⁾.

o **Quality Improvement (QI) Intervention to Improve Diabetes Care in Primary Care Settings:**

The void between advised diabetes mellitus care as well as care actually obtained by patients is significant^(36,37). In a recent study, even large clinical teams commonly did not have sensible resources, such as exterior motivations and info systems, to start or sustain

top quality renovation (QI) strategies ⁽³⁸⁾. Proof recommends that multicomponent QI interventions that tailor high quality renovation services to specific centers are a lot more effective compared to "one-size-fits-all" strategies ^(39,40). A QI adjustment process that is personalized to centers, implemented by facility leaders, as well as involves a broad cross-section of facility staff appears encouraging, particularly in tiny independent methods ⁽⁴¹⁾.

QI has been extensively used in various other industries to enhance operational procedures in a customized means and is typically used as a strategy to execute required changes in healthcare, including diabetic issues care. There have actually been no randomized tests of QI interventions in various other markets as well as only a couple of in the health care area.

Released research studies ^(42,43) reveal blended outcomes, yet excitement for the application of QI in healthcare continues, as techniques are modified and also instance records of improvement proceed. Clearly, more studies of this strategy are needed.

The advancement of quality efficiency measures, not new care standards, was the objective of the QI. Although the distinction between efficiency measures as well as standards could be

viewed as small, there are very important differences ⁽⁴⁴⁾. Performance determines retrospectively assess the degree of care delivered across the entire populace with diabetic issues, in contrast to guidelines that suggest the wanted level of take care of any single patient. Required requirements for an efficiency action include A) a strong evidence base; B) usefulness, integrity, and suitability for uniform application across healthcare systems; as well as C) irregularity throughout populations to make sure that improvement can be monitored (Figure 1)⁽⁴⁴⁾. By comparison, care guidelines define a high or perhaps excellent standard of care individualized to each patient that is based on evidence however additionally incorporates consensus that could be much less strenuous compared to that required for creating efficiency actions. Guidelines could guide care across subgroups of populations with diabetes, yet as opposed to performance steps, they will certainly not apply to all clinical scenarios. Performance steps are applied throughout whole populaces.

The QI intervention dramatically transformed the approach these facilities required to diabetes mellitus care improvement as well as substantially improved either composite

measures of the diabetes care procedure. Nevertheless, the intervention did not enhance various other actions of procedure or intermediate end results of care. Positive effect on high quality of care was limited, this information are amongst the first from a randomized test to show any kind of clear advantage to diabetes mellitus care from utilizing a QI intervention

(44,45)

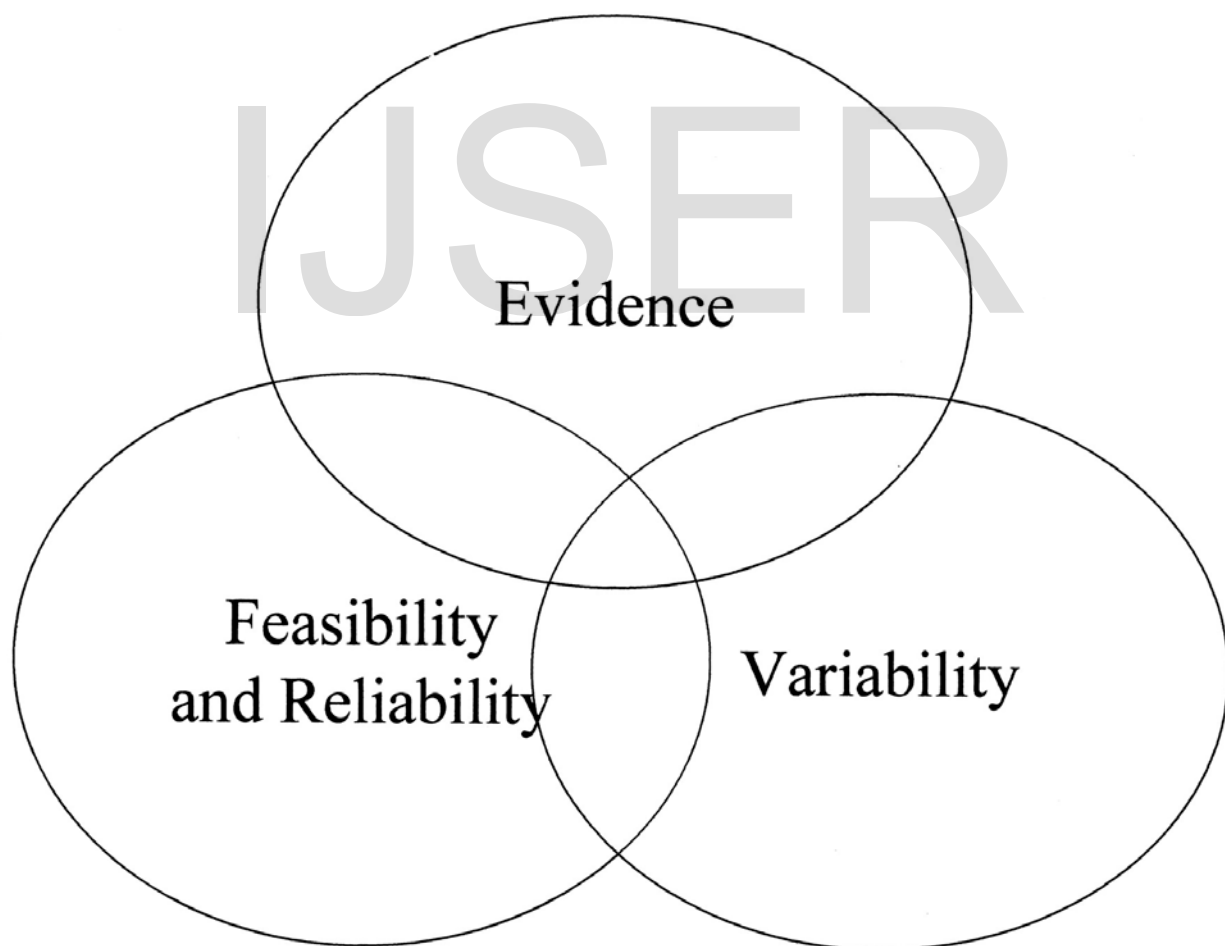


Figure 1: Relationship between evidence, feasibility, and variability for accountability in QI⁽⁴⁴⁾

○ *Improving management through Patient education and family support*

Diabetes self-management interventions may have to position greater focus on targeting family members' interaction abilities and also showing them positive means to affect patient wellness habits ⁽⁴⁶⁾. Member of the family can feel distressed by their loved one's diabetes as a result of restricted expertise regarding diabetes or otherwise knowing how you can sustain their loved one ^(47,48). Family members could additionally have misunderstandings, such as thinking the patient knows more concerning diabetes mellitus compared to the patient in fact reports or otherwise understanding their loved one's requirements in diabetic issues monitoring (49,50). Expertise about the condition, strategies to change family members regimens, and also ideal methods to cope with the emotional elements of the disease are several of the aspects of diabetes mellitus self-management that member of the family need ⁽⁵¹⁾. Enlightening member of the family regarding diabetes-care requirements could help relieve this strain by discussing why these adjustments are needed, how these adjustments could best be applied, and also where to discover added details, such as healthy dishes or exercise routines ⁽⁵¹⁾. Reliable household administration could additionally decrease the stress that family members may experience when dealing with transformed way of livings and condition progression ⁽⁵¹⁾. It is essential to provide member of the family with information about the ailment and also possible therapy options, validate their experiences as suppliers of support, show them numerous stress and anxiety administration skills, as well as help them plan for the future ⁽⁴⁶⁾.

Recognition of the vital duty that relative play has actually led increasingly to incorporating the index patient's member of the family into diabetes self-management treatments ⁽⁵²⁾. Relative play an especially substantial function in handling diabetic issues for kids and also teenagers; hence,

most family-based treatments to date have targeted kids with diabetic issues ^(53,54). A testimonial of family-based treatments for patients with diabetes mellitus carried out in 2005 located that most family member's interventions for diabetes mellitus in the previous 15 years were amongst youth as well as teenagers with type 1 diabetic issues, yet couple of researches had concentrated on adult patients and also their member of the family ⁽⁵⁵⁾.

Among adults, addition of a close family member in psychosocial interventions for persistent problems might likewise be more effective than focusing solely on the patient.⁴⁰ For example, including member of the family in instructional interventions has actually been shown to boost prices of smoking cessation and also fat burning ^(56,57). In an evaluation of treatments for households as well as pairs handling persistent health issue, including common neurological illness, heart diseases, cancer cells, and also diabetes, household interventions revealed guarantee in assisting patients as well as member of the family handle chronic ailments ⁽⁵⁸⁾. Among adults with diabetes, treatments including household or home participants of individuals with diabetes could be much more reliable than normal care in improving diabetes-related expertise as well as glycemic control ^(47,48,54). Family members support has actually also been connected with enhanced drug adherence and blood sugar level control in research studies of adults with diabetes.

Conclusion:

Poor diabetic patient's management usually because of Family physicians in primary care are not adhered to guidelines. Much evidence supports quality-improvement interventions for

diabetes management to increase physicians' adherence to guidelines and to improve patient outcomes, as well as the education and social support of these patients might help family doctors to improve their management strategies toward diabetic patients. Also the introduction of a multicomponent methods as telemedicine intervention in community primary care practices significantly improves the management approaches of diabetes.

References:

1. Unwin N, Whiting D, Guariguata L, Ghayour G: Gan De: IDF Diabetes Atlas. 2009, Brussels: International Diabetes Federation
2. Saydah SH, Eberhardt MS, Loria CM, Brancati FL: Age and the burden of death attributable to diabetes in the United States. *Am J Epidemiol.* 2002, 156: 714-719. 10.1093/aje/kwf111.
3. Haffner SM: Coronary heart disease in patients with diabetes. *N Engl J Med.* 2000, 342: 1040-1042. 10.1056/NEJM200004063421408.]
4. Woodwell DA, Cherry DK. National Ambulatory Medical Care Survey: 2002 Summary. Advance data from vital health statistics. Hyattsville, Md: National Center for Health Statistics; 2004. No. 346.
5. Jaen CR, Stange KC, Nutting PA. Competing demands of primary care: a model for the delivery of clinical preventive services. *J Fam Pract.* 1994;38:166-171.
6. Jaen CR, Stange KC, Tumiel LM, Nutting P. Missed opportunities for prevention: smoking cessation counseling and the competing demands of practice. *J Fam Pract.* 1997;45:348-354.

7. Testa MA, Simonson DC: Health economic benefits and quality of life during improved glycemic control in patients with type 2 diabetes mellitus. JAMA 280:1490–1496, 1998
8. UKPDS Study Group: Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 38. BMJ 317:703–713, 1998
9. Shojania KG, Ranji SR, McDonald KM: Effects of quality improvement strategies for type 2 diabetes on glycemic control: a meta-regression analysis. JAMA 296:427–440, 2006 [PubMed]
10. Institute of Medicine. Primary Care: America's Health in a New Era. Washington, DC, National Academies Press, 1996
11. Casalino LP: Disease management and the organization of physician practice. JAMA 293:485–488, 2005
12. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2003 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Can J Diabetes. 2003;27(Suppl 2):S1–151.
13. Mensing C, Boucher J, Cypress M, Weinger K, Mulcahey K, Barta P, et al. National standards for diabetes self-management education. American Diabetes Association: clinical practice recommendations 2001. Diabetes Care. 2001;24(Suppl 1):S1–133.
14. Ho M, Marger M, Beart J, Yip I, Shekelle P. Is the quality of diabetes care better in a diabetes clinic or in a general medicine clinic? Diabetes Care. 1997;20(4):472–5.
15. Leinung MC, Gianoukakis AG, Lee DW, Jeronis SL, Desemone J. Comparison of diabetes care provided by an endocrinology clinic and a primary-care clinic. Endocrinol Pract. 2000;6(5):361–6.
16. Grey N, Maljanian R, Staff I, Cruzmarino de Aponte M. Improving care of diabetic patients through a collaborative care model. Conn Med. 2002;66(1):7–11.
17. Montori VM, Dinneen SF, Gorman CA, Zimmerman BR, Rizza RA, Bjornsen SS, et al. The impact of planned care and a diabetes electronic management system on community-based diabetes care: the Mayo Health System Diabetes Translation Project. Diabetes Care. 2002;25(11):1952–7.

18. De Grauw WJ, van Gerwen WH, van de Lisdonk EH, van den Hoogen HJ, van den Bosch WJ, van Weel C. Outcomes of audit-enhanced monitoring of patients with type 2 diabetes. *J Fam Pract.* 2002;51(5):459–64.
19. Renders CM, Valk GD, Griffin S, Wagner EH, Eijk JT, Assendelft WJ. Interventions to improve the management of diabetes mellitus in primary care, outpatient and community settings. *Cochrane Database Syst Rev.* 2001;1:CD001481.
20. Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness. The chronic care model, part 2. *JAMA.* 2002;288(15):1909–14
21. Stroebe RJ, Scheitel SM, Fitz JS, Herman RA, Naessens JM, Scott CG, Zill DA, Muller L: A randomized trial of three diabetes registry implementation strategies in a community internal medicine practice. *Jt Comm J Qual Improv* 28:441–450, 2002
22. Wang A, Wolf M, Carlyle R, Wilkerson J, Porterfield D, Reaves J: The North Carolina experience with the diabetes health disparities collaboratives. *Jt Comm J Qual Saf* 30:396–404, 2004
23. Shulman RM, O'Gorman CS, Palmert MR: The impact of telemedicine interventions involving routine transmission of blood glucose data with clinician feedback on metabolic control in youth with type 1 diabetes: a systematic review and meta-analysis. *Int J Pediatr Endocrinol.* 2010, 2010: pii536957
24. Sutcliffe P, Martin S, Sturt J, Powell J, Griffiths F, Adams A, Dale J: Systematic review of communication technologies to promote access and engagement of young people with diabetes into healthcare. *BMC Endocr Disord.* 2011, 11: 1-10.1186/1472-6823-11-1.
25. Balas EA, Krishna S, Kretschmer RA, Cheek TR, Lobach DF, Boren SA: Computerized knowledge management in diabetes care. *Med Care.* 2004, 42: 610-621. 10.1097/01.mlr.0000128008.12117.f8.
26. Farmer A, Gibson OJ, Tarassenko L, Neil A: A systematic review of telemedicine interventions to support blood glucose self-monitoring in diabetes. *Diabet Med.* 2005, 22: 1372-1378. 10.1111/j.1464-5491.2005.01627.x.

27. Verhoeven F, van Gemert-Pijnen L, Dijkstra K, Nijland N, Seydel E, Steehouder M: The contribution of teleconsultation and videoconferencing to diabetes care: a systematic literature review. *J Med Internet Res*. 2007, 9: e37-10.2196/jmir.9.5.e37.
28. Shultz EK, Bauman A, Hayward M, Holzman R. Improved care of patients with diabetes through telecommunications. *Ann of the New York Academy of Sciences* 1992;670:141–5.
29. Marrero DG, Vandagriff JL, Kronz K, Fineberg NS, Golden MP, Gray D. Using telecommunication technology to manage children with diabetes: the Computer-Linked Outpatient Clinic (CLOC) Study. *Diabetes Educator* 1995; 21(4):313–9
30. Liang X, Wang Q, Yang X, Cao J, Chen J, Mo X, Huang J, Wang L, Gu D: Effect of mobile phone intervention for diabetes on glycaemic control: a meta-analysis. *Diabet Med*. 2011, 28: 455-463.
31. Montori VM, Helgemoe PK, Guyatt GH, Dean DS, Leung TW, Smith SA, Kudva YC: Telecare for patients with type 1 diabetes and inadequate glycemic control: a randomized controlled trial and meta-analysis. *Diabetes Care*. 2004, 27: 1088-1094. 10.2337/diacare.27.5.1088.
32. Russell-Minda E, Jutai J, Speechley M, Bradley K, Chudyk A, Petrella R: Health technologies for monitoring and managing diabetes: a systematic review. *J Diabetes Sci Technol*. 2009, 3: 1460-1471.
33. Verhoeven F, van Gemert-Pijnen L, Dijkstra K, Nijland N, Seydel E, Steehouder M: The contribution of teleconsultation and videoconferencing to diabetes care: a systematic literature review. *J Med Internet Res*. 2007, 9: e37-10.2196/jmir.9.5.e37.
34. Wu L, Forbes A, Griffiths P, Milligan P, While A: Telephone follow-up to improve glycaemic control in patients with type 2 diabetes: systematic review and meta-analysis of controlled trials. *Diabet Med*. 2010, 27: 1217-1225. 10.1111/j.1464-5491.2010.03113.x.
35. Polisena J, Tran K, Cimon K, Hutton B, McGill S, Palmer K: Home telehealth for diabetes management: a systematic review and meta-analysis. *Diabetes Obes Metab*. 2009, 11: 913-930. 10.1111/j.1463-1326.2009.01057.x.
36. Saaddine JB, Engelgau MM, Beckles GL, Gregg EW, Thompson TJ, Narayan KM: A diabetes report card for the United States: quality of care in the 1990s. *Ann Intern Med* 136: 565–574, 2002

37. Greenfield S, Kaplan SH, Kahn R, Ninomiya J, Griffith JL: Profiling care provided by different groups of physicians: effects of patient case-mix (bias) and physician-level clustering on quality assessment results. *Ann Intern Med* 136:111–121, 2002
38. Casalino L, Gillies RR, Shortell SM, Schmittdiel JA, Bodenheimer T, Robinson JC, Rundall T, Oswald N, Schauffler H, Wang MC: External incentives, information technology, organized processes to improve health care quality for patients with chronic diseases. *JAMA* 289: 434–441, 2003
39. Crabtree BF, Miller WL, Aita VA, Flocke SA, Stange KC: Primary care practice organization and preventive services delivery: a qualitative analysis. *J Fam Pract* 46: 403–409, 1998
40. Johnson PE, Veazie PJ, Kochevar L, O'Connor PJ, Potthoff SJ, Verma D, Dutta P: Understanding variation in chronic disease outcomes. *Health Care Manag Sci* 5: 175–189, 2002
41. Solberg LI, Brekke ML, Fazio CJ, Fowles J, Jacobsen DN, Kottke TE, Mosser G, O'Connor PJ, Ohnsorg KA, Rolnick SJ: Lessons from experienced guideline implementers: attend to many factors and use multiple strategies. *Jt Comm J Qual Improv* 26: 171–188, 2000
42. Solberg LI, Kottke TE, Brekke ML, Magnan S, Davidson G, Calomeni CA, Conn SA, Amundson GM, Nelson AF: Failure of a continuous quality improvement intervention to increase the delivery of preventive services: a randomized trial. *Eff Clin Pract* 3: 105–115, 2000
43. Berwick DM: Developing and testing changes in delivery of care. *Ann Intern Med* 128: 651–656, 1998
44. McClellan WM, Millman L, Presley R, Couzins J, Flanders WD: Improved diabetes care by primary care physicians: results of a group-randomized evaluation of the Medicare Health Care Quality Improvement Program (HCQIP). *J Clin Epidemiol* 56: 1210–1217, 2003
45. Chin MH, Cook S, Drum ML, Jin L, Guillen M, Humikowski CA, Koppert J, Harrison JF, Lippold S, Schaefer CT, the Midwest cluster health disparities collaborative: Improving diabetes care in midwest community health centers with the health disparities collaborative. *Diabetes Care* 27: 2–8, 2004

46. Martire LM, Schulz R, Helgeson VS, Small BJ, Saghafi EM. Review and Meta-analysis of Couple-Oriented Interventions for Chronic Illness. *Annals of behavioral medicine : a publication of the Society of Behavioral Medicine*. 2010;40:325–42.
47. Fisher L, Chesla CA, Skaff MM, Mullan JT, Kanter RA. Depression and anxiety among partners of European-American and Latino patients with type 2 diabetes. *Diabetes Care*. 2002;25:1564–70.
48. Gleeson-Kreig J, Bernal H, Woolley S. The role of social support in the self-management of diabetes mellitus among a Hispanic population. *Public Health Nurs*. 2002;19:215–22.
49. Carter-Edwards L, Skelly AH, Cagle CS, Appel SJ. “They Care But Don’t Understand”: Family Support of African American Women With Type 2 Diabetes. *The Diabetes Educator*. 2004;30:493–501.
50. White P, Smith SM, Hevey D, O’Dowd T. Understanding Type 2 Diabetes: Including the Family Member’s Perspective. *The Diabetes Educator*. 2009;35:810–7.
51. Trief PM, Morin PC, Izquierdo R, et al. Marital quality and diabetes outcomes: The IDEATel Project. *Families, Systems, & Health*. 2006;24:318.
52. Brown SA, Hanis CL. A community-based, culturally sensitive education and group-support intervention for Mexican Americans with NIDDM: a pilot study of efficacy. *Diabetes Educ*. 1995;21:203–10.
53. Hood KK, Rohan JM, Peterson CM, Drotar D. Interventions with adherence-promoting components in pediatric type 1 diabetes meta-analysis of their impact on glycemic control. *Diabetes Care*. 2010;33:1658–64.
54. Chesla CA. Do family interventions improve health? *Journal of family nursing*. 2010;16:355–77.
55. Armour TA, Norris SL, Jack L, Jr, Zhang X, Fisher L. The effectiveness of family interventions in people with diabetes mellitus: a systematic review. *Diabetic medicine : a journal of the British Diabetic Association*. 2005;22:1295–305.
56. Roski J, Schmid LA, Lando HA. Long-term associations of helpful and harmful spousal behaviors with smoking cessation. *Addictive behaviors*. 1996;21:173–85.
57. 54. Shiffman S, Brockwell SE, Pillitteri JL, Gitchell JG. Use of smoking-cessation treatments in the United States. *American journal of preventive medicine*. 2008;34:102–11.

58. Brownell KD. The central role of lifestyle change in long-term weight management. *Clinical cornerstone*. 1999;2:43–51.
59. Marrero DG. Time to Get Moving: Helping Patients With Diabetes Adopt Exercise as Part of a Healthy Lifestyle. *Clinical Diabetes*. 2005;23:154–9.
60. Shields CG, Finley MA, Chawla N. Couple and family interventions in health problems. *Journal of marital and family therapy*. 2012;38:265–80.

IJSER