

## **Self-Management of Type 2 Diabetes: A Synthesis of the Evidence**

**Nancy K. DalPezzo, RN, MSN**

**Cedar Crest College**

**Problem:** The National Institutes of Health estimates that 20.8 million Americans are afflicted with diabetes. Due to the prevalence of the disease, The Institute of Medicine has identified diabetes as one of its twenty priority areas for national action.

**Evidence:** Diabetes is a significant health problem in southeastern PA. In Lehigh County, PA, the death rate from diabetes is 69.9 per 100,000 people, as compared to the Healthy People 2010 goal of 45 per 100,000. 26% of patients admitted to the local Visiting Nurses Association suffer from complications of the disease. These complications are often the result of poor self-management of the condition.

**Strategy:** An extensive literature search was conducted to locate evidence regarding strategies and interventions to enhance diabetic self-management. Analysis was performed on evidence summaries, randomized control trials, evidence-based clinical practice guidelines, and primary research conducted between 2000 and 2006.

**Practice Change:** The evidence supports the use of the following seven strategies to improve diabetic self-management: a) Nursing assessments should include assessment of the patient's health beliefs and attitudes toward the disease; b) Patients should be actively involved in setting goals for their care; c) Diabetic education programs should incorporate active teaching strategies; d) Use of technology should be incorporated into diabetic education programs; e) Diabetic education should be repeated and reinforced over time; f) Diabetic care and education must be culturally appropriate; g) Patients should be enrolled in case management and/or disease management programs when available.

**Evaluation:** The seven strategies have recently been incorporated into the VNA Diabetes Education Program. Results will be available in December 2007. Preliminary feedback from patients and staff has been positive.

**Recommendations:** Providers of diabetic care and education should review and revise their programs and protocols to incorporate the seven supported strategies.

### **Bibliography**

- Adams, C. (2003). Lessons learned from urban Latinas with type 2 diabetes mellitus. *Journal of Transcultural Nursing, 14*(3), 255-265.
- Anderson-Loftin, W., Barnett, S., Bunn, P., Sullivan, P., Hussey, J., & Tavakoli, A. (2005). Soul food light: Culturally competent diabetes education. *The Diabetes Educator, 31*(4), 555-563.
- Anderson, R. M., Funnell, M. M., Nwankwo, R., Gillard, M. L., Oh, M., & Fitzgerald, J. T. (2005). Evaluating a problem-based empowerment program for African Americans with diabetes: results of a randomized controlled trial. *Ethnicity & Disease, 15*(4), 671-678.
- Balamurugan, A., Rivera, M., Jack, L., Jr., Allen, K., & Morris, S. (2006). Barriers to diabetes self-management education programs in underserved rural Arkansas: Implications for program evaluation. *Preventing Chronic Disease, 3*(1), A15.

- Barrera, M., Jr., Glasgow, R. E., McKay, H. G., Boles, S. M., & Feil, E. G. (2002). Do Internet-based support interventions change perceptions of social support?: An experimental trial of approaches for supporting diabetes self-management. *American Journal of Community Psychology, 30*(5), 637-654.
- Brown, S. A., Garcia, A. A., Kouzekanani, K., & Hanis, C. L. (2002). Culturally competent diabetes self-management education for Mexican Americans: The Starr County border health initiative. *Diabetes Care, 25*(2), 259-268.
- Chima, C. S., Farmer-Dziak, N., Cardwell, P., & Snow, S. (2005). Use of technology to track program outcomes in a diabetes self-management program. *J Am Diet Assoc, 105*(12), 1933-1938.
- Choe, H. M., Mitrovich, S., Dubay, D., Hayward, R. A., Krein, S. L., & Vijan, S. (2005). Proactive case management of high-risk patients with type 2 diabetes mellitus by a clinical pharmacist: a randomized controlled trial. *The American journal of managed care, 11*(4), 253-260.
- Chumbler, N. R., Neugaard, B., Kobb, R., Ryan, P., Haijing, Q., & Yongsung, J. (2005). Evaluation of a care coordination/home-telehealth program for veterans with diabetes. *Evaluation and the Health Professions, 28*(4), 464-478.
- Clark, M., Hampson, S. E., Avery, L., & Simpson, R. (2004). Effects of a tailored lifestyle self-management intervention in patients with type 2 diabetes. *British journal of health psychology, 9*(Pt 3), 365-379.
- Deakin, T., McShane, C. E., Cade, J. E., & Williams, R. (2006). Group based training for self-management strategies in people with type 2 diabetes mellitus [Systematic Review]. *Cochrane Database of Systematic Reviews, 4*, 4.
- Egede, L. E., & Bonadonna, R. J. (2003). Diabetes self-management in African Americans: An exploration of the role of fatalism. *Diabetes Educator, 29*(1), 105-115.
- Estabrooks, P. A., Nelson, C. C., Xu, S., King, D., Bayliss, E. A., Gaglio, B., et al. (2005). The frequency and behavioral outcomes of goal choices in the self-management of diabetes. *Diabetes Educator, 31*(3), 391-400.
- Gabbay, R. A., Lendel, I., Saleem, T. M., Shaeffer, G., Adelman, A. M., Mauger, D. T., Collins, M., Polomano, R. C. (2006). Nurse case management improves blood pressure, emotional distress and diabetes complication screening. *Diabetes Research and Clinical Practice, 71*(1), 28-35.
- Garrett, N., Hageman, C. M., Sibley, S. D., Davern, M., Berger, M., Brunzell, C., et al. (2005). The effectiveness of an interactive small group diabetes intervention in improving knowledge, feeling of control, and behavior. *Health Promotion Practice, 6*(3), 320-328.
- Gary, T. I., Batts-Turner, M., Bone, L. R., Yeh, H. C., Wang, N. Y., Hill-Briggs, F., et al. (2004). A randomized controlled trial of the effects of nurse case manager and community health worker team interventions in urban African-Americans with type 2 diabetes. *Controlled Clinical Trials, 25*(1), 53-66.
- Gerber, B. S., Brodsky, I. G., A., L. K., Smolin, L. I., Arozullah, A. M., Smith, E. V., et al. (2005). Implementation and evaluation of a low-literacy diabetes education computer multimedia application. *Diabetes Care, 28*(7), 1574-1580.
- Glasgow, R. E., Boles, S. M., McKay, H. G., Feil, E. G., & Barrera, M., Jr. (2003). The D-Net diabetes self-management program: Long-term implementation, outcomes, and generalization results. *Preventive Medicine, 36*(4), 410-419.

- Glasgow, R. E., Nutting, P. A., Toobert, D. J., King, D. K., Strycker, L. A., Jex, M., et al. (2006). Effects of a brief computer-assisted diabetes self-management intervention on dietary, biological and quality-of-life outcomes. *Chronic Illness*, 2(1), 27-38.
- Glasgow, R. E., Strycker, L. A., King, D. K., Toobert, D. J., Rahm, A. K., Jex, M., et al. (2006). Robustness of a computer-assisted diabetes self-management intervention across patient characteristics, healthcare settings, and intervention staff. *American Journal of Managed Care*, 12(3), 137-145.
- Glazier, R. H., Bajcar, J., Kennie, N. R., & Willson, K. (2006). A systematic review of interventions to improve diabetes care in socially disadvantaged populations. *Diabetes Care*, 29(7), 1675-1679.
- Gleeson-Kreig, J., Bernal, H., & Woolley, S. (2002). The role of social support in the self-management of diabetes mellitus among a Hispanic population. *Public Health Nursing*, 19(3), 215-222.
- Goudswaard, A. N., Stolk, R. P., Zuithoff, N. P., de Valk, H. W., & Rutten, G. E. (2004). Long-term effects of self-management education for patients with Type 2 diabetes taking maximal oral hypoglycaemic therapy: A randomized trial in primary care. *Diabetes Medicine*, 21(5), 491-496.
- Gucciardi, E., Smith, P. L., & Demelo, M. (2006). Use of diabetes resources in adults attending a self-management education program. *Patient Education and Counseling*, 64(1-3), 322-330.
- Hendricks, L. E., & Hendricks, R. T. (2000). The effect of diabetes self-management education with frequent follow-up on the health outcomes of African American men. *Diabetes Educator*, 26(6), 995-1002.
- Ingram, M., Gallegos, M. S., & Elenes, J. (2005 Jan). Diabetes is a community issue: The critical elements of a successful outreach and education model on the U.S.-Mexico border. *Preventing Chronic Disease [serial on-line]*, 2(1), retrieved on January 3, 2007 from [http://www.cdc.gov/pcd/issues/2005/jan/2004\\_0078.htm](http://www.cdc.gov/pcd/issues/2005/jan/2004_0078.htm).
- Institute of Medicine. (2003). *Priority areas for national action: Transforming health care quality*. National Academies Press. Retrieved December 31, 2006, from [http://orsted.nap.edu/openbook.php?record\\_id=10593&page=60](http://orsted.nap.edu/openbook.php?record_id=10593&page=60)
- Involving patients with type 2 diabetes, hypertension, and hyperlipidemia in disease management improved outcomes [Therapeutics]. (2003). *ACP Journal Club January/February*, 138(1), 13.
- Jackson, C. L., Bolen, S., Brancati, F. L., Batts-Turner, M. L., & Gary, T. L. (2006). A systematic review of interactive computer-assisted technology in diabetes care. Interactive information technology in diabetes care. *Journal of General Internal Medicine*, 21(2), 201-202.
- Keers, J. C., Bouma, J., Links, T. P., ter Maaten, J. C., Gans, R. O., Wolffenbuttel, B. H., et al. (2006). One-year follow-up effects of diabetes rehabilitation for patients with prolonged self-management difficulties. *Patient Education and Counseling*, 60(1), 16-23.
- Kim, H. S., & Oh, J. A. (2003). Adherence to diabetes control recommendations: Impact of nurse telephone calls. *Journal of Advanced Nursing*, 44(3), 256-261.
- Kirchbaum, K., Aarestad, V., & Buethe, M. (2003). Exploring the connection between self-efficacy and effective diabetes self-management. *Diabetes Educator*, 29(4), 653-662.

- Kubiak, T., Hermanns, S., Schreckling, H. J., Kulzer, B., & Haak, T. (2006). Evaluation of a self-management-based patient education program for the treatment and prevention of hypoglycemia-related problems. *Patient Education and Counseling*, 60(2), 228-234.
- Leu, M. G., Norris, T. E., Hummel, J., Isaac, M., & Brogan, M. W. (2005). A randomized, controlled trial of an automated wireless messaging system for diabetes. *Diabetes Technology & Therapeutics*, discussion 719-720.
- Loveman, E., Royle, P., & Waugh, N. (2006). Specialist nurses in diabetes mellitus. *Cochrane Database of Systematic Reviews*, 4.
- Maljanian, R., Grey, N., Staff, I., & Conroy, L. (2005). Intensive telephone follow-up to a hospital-based disease management model for patients with diabetes mellitus. *Disease Management : Diabetes Mellitus*, 8(1), 15-25.
- Naeem, A. G. (2003). The role of culture and religion in the management of diabetes: A study of Kashmiri men in Leeds. *The Journal of The Royal Society for the Promotion of Health*, 123(2), 110-116.
- Nagelkerk, J., Reick, K., & Meengs, L. (2006). Perceived barriers and effective strategies to diabetes self-management. *Journal of Advanced Nursing*, 54(2), 151-158.
- National Diabetes Clearinghouse. (2005). National diabetes statistics. Retrieved on December 12, 2006, from <http://diabetes.niddk.nih.gov/dm/pubs/statistics/index.htm>
- National Guideline Clearinghouse. (2001). Recommendations for healthcare system and self-management education interventions to reduce morbidity and mortality from diabetes. Retrieved on December 12, 2006, from [http://www.guideline.gov/summary/summary.aspx?ss%20=15&doc\\_id=3178&string=diabetes+AND+disease+AND+management](http://www.guideline.gov/summary/summary.aspx?ss%20=15&doc_id=3178&string=diabetes+AND+disease+AND+management)
- Norris, S. L., Lau, J., Smith, S. J., Schmid, C. H., & Engelgau, M. M. (2002). Self-management education for adults with type 2 diabetes: A meta-analysis of the effect on glycemic control. *Diabetes Care*, 25(7), 1159-1171.
- Norris, S. L., Engelgau, M., & Narayan, V. (2001). Effectiveness of self-management training in type 2 diabetes: A systematic review of randomized controlled trials. *Diabetes Care*, 24, 561-587.
- Norris, S. L., Chowdhury, F. M., Van Le, K., Horsley, T., Brownstein, J. N., Zhang, X., Jack, L., & Satterfield, D. W. (2006). Effectiveness of community health workers in the care of persons with diabetes. *Diabetic Medicine*, 23(5), 544-556.
- Oh, J., Kim, H. S., Yoon, K. H., & Choi, E. S. (2003). A telephone-delivered intervention to improve glycemic control in type 2 diabetic patients. *Yonsei Medical Journal*, 44(1), 1-8.
- Parchman, M., Arambula-Solomon, T. G., Noel, P. H., Larme, A. C., & Pugh, J. A. (2003). Stage of change advancement for diabetes self-management behaviors and glucose control. *The Diabetes Educator*, 29(1), 128-134.
- Paterson, B., & Thorne, S. (2000). Developmental evolution of expertise in diabetes self-management. *Clinical Nursing Research*, 9(4), 402-419.
- Pennsylvania Department of Health. (2006). *Healthy people 2010: Diabetes in pennsylvania counties*. Retrieved on January 13, 2007, from [http://www.dsf.health.state.pa.us/health/lib/health/HP2010/hp2010-all\\_counties.pdf](http://www.dsf.health.state.pa.us/health/lib/health/HP2010/hp2010-all_counties.pdf)
- Polonsky, W. H., Earles, J., Smith, S., Pease, D. J., Macmillan, M., Christensen, R., et al. (2003). Integrating medical management with diabetes self-management training: a randomized control trial of the Diabetes Outpatient Intensive Treatment Program. *Diabetes Care*, 26(11), 3048-3053.

- Renders, C. M., Valk, G. D., Griffin, S., Wagner, E. H., van Joth, E., & Assendelft, W. J. J. (2006). Interventions to improve the management of diabetes mellitus in primary care, outpatient and community settings. *Cochrane Database of Systematic Reviews*, 4.
- Review: Self-management training in type 2 diabetes mellitus is effective in the short term [Therapeutics]. (2001). *ACP Journal Club September/October*, 135(2), 45.
- Review: Involving patients with type 2 diabetes, hypertension, and hyperlipidemia in disease management improved outcomes. (2003). *ACP Journal Club January/February*, 138(1), 13.
- Rickheim, P., Weaver, T. W., Flader, J. L., & Kendall, D. M. (2002). Assessment of group versus individual diabetes education: A randomized study. *Diabetes Care*, 25(2), 269-274.
- Rosal, M. C., Olendzki, B., Reed, G. W., Gumieniak, O., Scavron, J., & Ockene, I. (2005). Diabetes self-management among low-income Spanish-speaking patients: A pilot study. *Annals of Behavioral Medicine* 29(3), 225-235.
- Samuel-Hodge, C. D., Keyserling, T. C., France, R., Ingram, A. F., Johnston, L. F., Pullen Davis, L., et al. (2006). A church-based diabetes self-management education program for African Americans with type 2 diabetes. *Preventing Chronic Disease*, 3(3), A93.
- Sarkar, U., Fisher, L., & Schillinger, D. (2006). Is self-efficacy associated with diabetes self-management across race/ethnicity and health literacy? *Diabetes Care*, 29(4), 823-829.
- Satterfield, D., Burd, C., Valdez, L., Hosey, G., & Shield, J. (2002). The "In-Between People": Participation of community health representatives in diabetes prevention and care in American Indian and Alaska Native communities. *Health Promotion Practice*, 3(2), 166-175.
- Siminerio, L. M. (2006). Implementing diabetes self-management training programs: Breaking through the barriers in primary care. *Endocrinology Practice*, 12 Suppl 1, 124-130.
- Sprague, M. A., Shultz, J. A., & Branen, L. J. (2006). Understanding patient experiences with goal setting for diabetes self-management after diabetes education. *Family and Community Health*, 29(4), 245-255.
- Van Dam, H. A., Van Der Horst, F., Knoops, L., Ryckman, R. M., Crebolder, H. F., Van Den Borne, B. H. (2005). Social support in diabetes: A systematic review of controlled intervention studies. *Patient Education and Counseling*, 59(1), 1-12.
- Vermeire, E., Wens, J., Van P, R., Biot, Y., Hearnshaw, H., & Lindenmeyer, A. (2006). Interventions for improving adherence to treatment recommendations in people with type 2 diabetes mellitus [Systematic Review]. *Cochrane Database of Systematic Reviews*, 4, 4.
- Weijman, I., Ros, W. J., Rutten, G. E., Schaufeli, W. B., Schabracq, M. J., & Winnubst, J. A. (2005). The role of work-related and personal factors in diabetes self-management. *Patient Education and Counseling*, 59(1), 87-96.
- Whittemore, R., D'Eramo Melkus, G., & Grey, M. (2005). Metabolic control, self-management and psychosocial adjustment in women with type 2 diabetes. *Journal of Clinical Nursing*, 14(2), 195-203.
- Whittemore, R., Melkus, G. D., Sullivan, A., & Grey, M. (2004). A nurse-coaching intervention for women with type 2 diabetes. *The Diabetes Educator*, 30(5), 795-804.

- Williams, G. C., McGregor, H., Zeldman, A., Freedman, Z. R., Deci, E. L., & Elder, D. (2005). Promoting glycemic control through diabetes self-management: Evaluating a patient activation intervention. *Patient Education and Counseling*, 56(1), 28-34.
- Williams, G. C., McGregor, H. A., Zeldman, A., Freedman, Z. R., & Deci, E. L. (2004). Testing a self-determination theory process model for promoting glycemic control through diabetes self-management. *Health Psychology*, 23(1), 58-66.
- Wolf, J. (2006). The benefits of diabetes self-management education of the elderly veteran in the home care setting. *Home Healthcare Nurse*, 24(10), 645-651.