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Nurse case management improves blood pressure, emotional distress and diabetes complication screening

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Abstract

We studied the impact of nurse case management (NCM) on blood pressure (BP), hemoglobin A1C, lipids, and diabetes complication screening.

A 1-year randomized-controlled trial was conducted in two primary care clinics of the Penn State Hershey Medical Center. Diabetes patients were randomized to control group (CG) ($n = 182$) who received usual care by their primary care provider and intervention group (IG) ($n = 150$) who received additional NCM care, including self-management education, and implementation of diabetes guidelines. Primary outcomes included BP, A1C, lipid, process measures, and secondary outcome was diabetes-related emotional distress as assessed by Problem Areas in Diabetes (PAID).

BP significantly decreased from 137/77 to 129/72 in IG as compared to an increase from 136/77 to 138/79 in CG after 1 year. PAID scores improved significantly in IG (from 23 to 10) due to reduced emotional stress. A1C (7.4) and LDL (105) were unaffected. Complications screening significantly improved in IG compared to CG: opthalmologic exam 26 to 68%, foot exam 47 to 64%, and nephropathy screening 34 to 72%.

NCM improved BP, diabetes-related emotional distress, and process measures in primary care. Unchanged A1C and lipids might be due to a threshold effect. Intervention based upon initial risk assessment may prove more cost-effective.

Keywords: Hypertension; Nurse case management; Emotional distress; Disease management

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1. Introduction

Diabetes mellitus affects nearly 20 million people in the U.S. and is the leading cause of kidney failure, blindness and non-traumatic amputations and leads to a higher incidence of cardiovascular disease [1]. In 2002, the health care cost associated with diabetes was estimated at $132 billion, most of which was attributed to potentially preventable chronic complications of diabetes [1]. Interventions by nurse case managers can improve health outcomes by promoting self-management behaviors and adherence to healthy life style changes [2]. Coordination of care, patient education, patient and family counseling, and close monitoring of health outcomes are all integral part of nurse case management (NCM) and have significant potential advantages over physician-based care alone.

Achievement of certain intermediate outcome goals including A1c level less than 7.0 [3], LDL less than 100 [4] and blood pressure (BP) less than 130/80 [5] can significantly reduce morbidity and mortality in patients with type 2 diabetes. Complication screening recommendations include yearly screening for neuropathy by monofilament testing, for retinopathy by opthalmologic exam, for nephropathy with microalbumin/creatinine ratio, vaccination against pneumonia, smoking cessation counseling, and visits with a dietitian and a certified diabetes nurse educator [7].

Unfortunately, these evidence-based standards have not always translated into practice for patients with type 2 diabetes. National population-based cross sectional surveys found that 18.0% of patients had poor glycemic control (A1C $>$ 9.5), 65.7% had a BP less than 140/90 mmHg (likely fewer patients are reaching the current goal of 130/80), and only 42% had LDL cholesterol level below 130 [8]. According to the National Healthcare Quality Report, only 20.7% of patients with diabetes had screening for all five major complications done in the year 2000 [9].

Barriers to comprehensive patient-centered care, which include insufficient time for physicians to monitor and treat multiple clinical issues (visit time has been decreasing as patient complexity has increased) [10], unfamiliarity with behavioral modification techniques to improve patients outcomes, and patients' lack of knowledge of therapeutic goals, self-management skills and life style changes still remain the most significant obstacles to diabetes management. NCM offers opportunities to implement effective interventions for patients to overcome these obstacles that hamper diabetes management. Care delivery models that utilize NCM incorporate three primary components: (a) resource utilization and management; (b) care coordination that establishes a point of service for improving communication and mobilization of resources and support among the primary care physicians, physician specialists, diabetes educators and community-based services; and (c) clinical management that involves close monitoring of patients and implementation of diabetes and co-morbidity guidelines, offering education and counseling to promote self-management and adherence [2,11,12]. Attention to individualized patient-centered care through empowerment of patients to make the necessary changes in life style is an important contribution of NCM-based diabetes care. Regardless of the disease-focused care, this type of management can result in measurable improvements in patient outcomes [2].

Both efficacy and effectiveness of NCM in improving glycemic control in diabetes were demonstrated in a recent systematic review by Norris et al. [13]. However few studies have utilized a randomized trial to examine the efficacy of NCM on some of the most important goals of diabetes care,—BP and cholesterol control, complication screening, and alleviating emotional distress with diabetes that can hamper adherence.

While many patients with type 2 diabetes experience emotional distress, which can lead to deterioration in health-related quality of life (HrQOL), decreased motivation for life style changes, and inability to cope, only one study of NCM in adult diabetic patients assessed HrQOL and reported an improvement [14]. The Problem Areas in Diabetes (PAID) questionnaire is a population-specific instrument with established reliability and validity for measuring changes in psychosocial and emotional states associated with diabetes [15].

To address the shortcoming of prior research on the advantages of implementing NCM-based care for diabetes patients, we conducted a randomized-controlled trial of NCM to measure the impact of a patient-oriented structured approach to care coordination and patient education and counseling on improvements in BP, glycemic control, lipids, complication screening, and diabetes-related distress.