

Diabetes Disease Management Program Is More Effective for Patients with Low Literacy

Rothman RL, DeWalt DA, Malone R, et al. Influence of patient literacy on the effectiveness of a primary care-based diabetes disease management program. *JAMA* 2004;292:1711–6.

Study Overview

Objective. To examine the impact of a diabetes disease management program on patients with and without low literacy.

Design. Post hoc subgroup analysis of a randomized controlled trial of a diabetes disease management program.

Setting and participants. Adults with type 2 diabetes cared for in a general internal medicine clinic affiliated with an academic medical center in the United States were eligible if they had a glycosylated hemoglobin of $\geq 8.0\%$, spoke English, and were referred for participation by their primary care physician. Literacy was evaluated using the Rapid Estimate of Adult Literacy in Medicine screening test. Patients reading below the 7th grade level were classified as having low literacy.

Intervention. Intervention group patients received one-on-one patient education by a pharmacist diabetes educator who could initiate and titrate glucose and blood pressure-lowering medications. They also received interventions to address other barriers including telephone reminders and help with transportation, communication, and insurance problems. Patient contact with pharmacists occurred in person or by phone at least every 2 to 4 weeks. Pharmacists were aware of patients' literacy test results. Communication was tailored to patients' level of literacy and included simplified explanations, teach-back techniques, and educational materials with pictures for patients with low literacy. Control patients received a 1-hour educational session and routine primary care.

Main outcome measures. Glycosylated hemoglobin and systolic blood pressure at 6 and 12 months of follow-up.

Main results. 217 patients were randomized, and 83 had low literacy. Glycosylated hemoglobin decreased 1.4% (95% confidence interval [CI], -2.3 to -0.6%) among intervention patients in the low literacy subgroup compared with low literacy controls. However, glycosylated hemoglobin fell only 0.5% (95% CI, -1.4 to 0.3%) in the subgroup without low liter-

acy. Systolic blood pressure decreased more in the intervention group than in controls (-7.6 mm Hg [95% CI, -13.0 to -2.2]) but was not significantly different for patients with and without low literacy.

Conclusion. A diabetes disease management program may be useful to reduce glycosylated hemoglobin in patients with low literacy.

Commentary

Unfortunately, poor control of blood sugar and cardiovascular risk factors is a common and frustrating problem for persons with diabetes and their health care providers [1]. Because diabetes control depends heavily on patients' self-management behaviors as well as frequent contact with health care providers, diabetes disease management programs have been developed to improve patients' comprehension of their disease, support self-management skills, and coordinate the provision of care from the health care system. Many such programs have effectively reduced glycosylated hemoglobin to a modest extent [2].

This study by Rothman et al is notable because even though the low literacy subgroup was small, their intervention resulted in a clinically relevant and statistically robust decline in glycosylated hemoglobin for this vulnerable group. The techniques used by the participating disease management clinicians—avoiding jargon, use of simple explanations, encouraging the teaching back of important content to demonstrate understanding, and the use of educational materials that contain pictures—may be worth emulating by other programs for diabetes patients with low literacy. Rothman et al's results raise important questions that will be of interest to planners of comprehensive diabetes programs. Do barriers to glycemic control faced by patients with normal literacy differ from those of low literacy patients? If so, are these barriers more formidable, since a program with considerable one-on-one contact time could not overcome them? The authors report that neither the time spent with patients nor the number of medications added or titrated in the intervention group differed by literacy status. It is possible that improving glycemic control for patients of higher literacy

may require more intensive adjustments to medical regimens since there may be less room to improve control through improving patients' self-management skills and disease understanding. The reason that blood pressure control improved for both literacy groups may be due to the fact that, for most patients, hypertension self-management is less complex than hyperglycemia self-management (eg, complex medication regimens, diet and exercise habits). For blood pressure, frequent medication titration may have been what was needed to improve control. Since this study was a post hoc analysis, future studies are needed to confirm these results.

Applications for Clinical Practice

For providers caring for low literacy patients, a disease

management approach that uses one-on-one contact and is tailored a patient's literacy level may produce clinically relevant reductions in glycosylated hemoglobin.

—Review by Stephen D. Persell, MD, MPH

References

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