How Best to Sustain Improvements in Glycemic Control Achieved in Diabetes Self-Management Training Programs? A Randomized Controlled Trial Comparing Peer Mentoring with Community Health Worker (CHW) Outreach

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Background: Multiple studies suggest that without sustained follow-up support, diabetes self-management training programs only lead to short-term improvements (less than 6 months) in glycemic control. This is especially the case among low-income ethnic and racial minorities in resource-poor settings such as inner-city communities in which adults with diabetes face multiple challenges to diabetes self-management. Federally qualified health centers serving these communities often lack the resources to maintain intensive care management programs staffed by health care professionals to provide between-clinic visit outreach to adults with diabetes who have completed short-term diabetes self-management programs. Accordingly, we sought to compare a peer mentor program with periodic community health worker (CHW) telephone outreach as two possible means to maintain any gains achieved through an evidence-based diabetes self-management program that we have found in prior RCTs to improve glycemic control compared to usual care.

Methods: The study was conducted at a federally qualified health center in the very low-income, predominantly Latino Southwest of Detroit. In a parallel randomized controlled trial, we randomized adults with poorly controlled diabetes (A1c>7.5%) to one of two groups: 1) a six-month CHW-led diabetes self-management program and then 12 months of weekly drop-in group sessions or telephone outreach from an adult with diabetes (“peer mentor”) who had completed the diabetes self-management program and 24 hours of training in empowerment-based facilitation approaches; or 2) a six-month CHW-led diabetes self-management program and then 12 months of monthly CHW telephone outreach. We conducted intention-to-treat repeated measures assessments of changes in A1c between baseline, six-months (immediately after the diabetes self-management training program), 12-months, and 18-months follow-up. We also examined differences between the two groups.

Results: 116 Latino adults with diabetes were randomized to one of the two arms. There were no significant differences in baseline characteristics between groups. Mean age was 49 years. 77% had less than a high school education, and 94% had an annual household income of less than $20,000. 95% were on oral diabetes medications and/or insulin. In intention to treat analyses, mean A1c in the group randomized to the peer mentoring arm improved from 8.0% to 7.3% by the conclusion of the six-month diabetes self-management training, with mean A1cs of 7.5% at 18-months follow-up, still a clinically significant 0.5% less than at baseline. In the group receiving monthly CHW follow-up, baseline mean A1cs of 7.7% decreased to 7.2% at six-month follow-up and increased slightly to 7.3% at 18-months, 0.4% lower than at baseline. The differences between groups were not statistically or clinically significant.

Conclusions: Among these low-income inner-city Latino adults with diabetes, both peer mentoring in weekly group support sessions or fortnightly telephone outreach from volunteer trained diabetes patients and monthly community health worker telephone outreach led to maintenance of gains achieved in an evidence-based diabetes self-management training program. The sustained improvements in glycemic control we observed are equivalent to those achieved in more resource-intensive health professional-led care management programs. Both of the low-cost strategies evaluated in this RCT appear to be effective in sustaining achieved improvements.
Trends in the Quality of Care and Racial/Ethnic Disparities in US Hospitals, 2005-2010

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Background: In 2004, the Centers for Medicare and Medicaid Services (CMS) initiated public reporting on the quality of care in US hospitals for 3 common conditions: acute myocardial infarction (AMI), congestive heart failure (CHF), and community-acquired pneumonia (CAP). Hospitals report performance without stratifying results for vulnerable subgroups; therefore, it is unclear whether potential secular changes in performance are accompanied by corresponding changes in racial and ethnic differences. We examined trends in the quality of care for white, black, and Hispanic patients during the 6 years following the public reporting initiative.

Methods: We used 2005-2010 data from the Quality Improvement Organization Clinical Data Warehouse, a CMS-maintained all-payer patient-level repository to which approximately 95% of US hospitals report. We included patients age 18 and older sampled for at least 1 quality indicator. The outcomes were adherence to 18 quality indicators for AMI, CHF and CAP. The primary independent variable was race/ethnicity (non-Hispanic white, black, Hispanic). Covariates included age, sex, comorbidities and the following hospital characteristics: volume, bed size, teaching status, and rural location. We employed hierarchical regression to model within-hospital disparities (quality gaps between whites and minority patients at the same hospital) and between-hospital disparities (quality gaps arising from disproportionate concentration of black or Hispanic patients in low-quality hospitals). We examined change over time in all measures and change in racial/ethnic disparities for measures that had at least a 3 point white-black or white-Hispanic difference in 2005.

Results: The sample included 13,297,043 hospitalizations in 5013 acute care hospitals. From 2005 to 2010, performance rates improved on all 18 measures, ranging from 3.2% for receipt of aspirin at discharge (from 95.4% to 98.6%; p<0.001) to 49.1% for receipt of PCI within 90 minutes (from 42.0% to 91.1%; p<0.001). The white-black difference (higher quality for whites) exceeded 3% for 8 measures in 2005. The white-black gap significantly narrowed over time for 7, ranging from a 2% decrease in disparity in blood culture prior to antibiotic administration to an 11.9% decrease in disparities for influenza vaccination (p<0.001 for each change). The white-Hispanic disparity exceeded 3% for 12 measures in 2005. We observed significant narrowing of this disparity over time for all of these measures. The reductions ranged from a 1.4% decrease in disparity for guideline-consistent antibiotic selection to a 12.9% decrease in disparity for pneumococcal vaccination (p<0.001 for each change). In analyses of the 3 measures with the largest racial-ethnic gaps in 2005, changes in within-hospital disparity accounted for 51%-55% of the decline in white-black disparity and 23%-48% of the decline in white-Hispanic disparity. Changes in between-hospital disparity accounted for 49%-55% of the decline in white-black disparity and 52%-77% of the decline in white-Hispanic disparity.

Conclusions: From 2005 to 2010, we observed overall improvements and significantly narrowed racial and ethnic disparities in the quality of hospital care for AMI, CHF, and CAP. Reductions in racial/ethnic disparities were driven both by more equal care for whites and minorities receiving care in the same hospital and improved quality of care among hospitals serving disproportionately higher proportions of minority patients.
Impact of Work Conditions on Errors and Quality: A Comparison of Primary Care Clinics Serving Large Proportions of Minority Patients to Those That Do Not

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Background: Racial disparities in care may be partly due to differences in work characteristics. We have reported that primary care clinics serving larger proportions of minority patients have less access to supplies, specialists and exam rooms. Also physicians in these clinics report more chaos, more time pressure, and less work control. Whether these work differences mediate quality of care in clinics with large minority populations is unknown. We compared chart audit data from clinics with larger versus smaller proportions of minority patients to assess associations between the work environment, medical errors and care quality.

Methods: MEMO (Minimizing Error, Maximizing Outcome) is a 4-year longitudinal investigation involving primary care physicians and their adult patients with hypertension and/or diabetes. Chart audit data were contrasted between clinics with ≥30% minority patients (Minority Clinics=MCs) versus <30% (Non-Minority Clinics=NMCs). Work conditions considered as potential mediators of care quality included chaos, time pressure, work control, access to clinical resources, specialty referrals and exam rooms. In a series of two-level hierarchical (patient-physician) models, each work condition was tested as a potential mediator between minority clinic status and each error or quality outcome. Outcomes of interest included errors, quality, hypertension control, and diabetes control. An error score assigned a point for each missing care process (e.g., missed diagnosis, medication error, lack of cancer screening). A quality score assigned a point for each element of disease control according to national guidelines: hypertension control was defined as BP<140/90 for ≥50% of recorded measurements and diabetes control was defined as a hemoglobin A1c ≤7.5% for ≥50% of recorded measurements in the 18-month audit period. Scores were normalized to a range of 0-100 by dividing the number of error/quality points by the number of applicable items and multiplying by 100. Models were adjusted for patient age, gender, and comorbidity, and physician age, gender, and specialty.

Results: The sample included 287 physicians and 1207 patients in 73 clinics (26 MCs, 47 NMCs). Fewer rooms were available to physicians in MCs (2.1 vs 2.7 in NMCs, p<0.001). Overall adjusted error rates were almost 5% higher in MCs than NMCs (29.6% vs 24.8%, p<0.05). While MC status predicted all mediators in the error models, only poor access to clinical resources (e.g. supplies and equipment) completely mediated the relationship between MC status and total errors (p<0.05). Adjusted quality scores were not significantly different between MCs and NMCs (65.9% vs 68.6%, p=0.38). Exam room availability, however, was related to care quality in all clinics with each additional room increasing quality scores by almost 6%. While hypertension control was similar between MCs and NMCs, BP control was lower in MCs with less specialist access (OR=0.33, 95% CI 0.24, 0.46) and less room availability (OR=0.22, 95% CI 0.16, 0.29). Diabetes control was worse for patients in MCs than in NMCs (OR=0.51, 95% CI 0.35, 0.73); with 24% of this difference explained by less access to clinical resources.

Conclusions: Primary care work conditions, including lack of access to supplies, rooms, and referrals, was significantly associated with errors and quality, especially for MCs. Future work should assess if changes in work conditions can improve care quality and decrease medical errors for minority patients.
“Friending” Physical Activity: Results from the Social Networking for Activity Promotion with Cell Phones (SNAP-C) Study

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Background: Programs designed to help sedentary adults increase their physical activity (PA) are often effective in the short-term, but these effects are rarely maintained. Technology-based physical activity programs, such as those using cell phones, may help expand social networks that could support maintenance of PA. However, little research has explored how to engineer social networks to increase opportunities for PA. This study aims to explore the efficacy of using cell phones to engineer social networks using Facebook to provide long-term support for active lifestyles.

Methods: Study Design - We conducted a randomized controlled trial to evaluate the effectiveness of a cell-phone based intervention to promote PA relative to an attention control group (emphasizing good nutrition).

Study Participants - 87 participants were age and gender-matched prior to randomization to either an 8-week physical activity group or the control group. Inclusion criteria were: ages 25-64, sedentary, English-speaking, able to participate in moderate-intensity physical activity, ownership of a smart phone, and home computer with Internet access. Exclusion criteria were: body mass index greater than 39.9, consumption of 5 or more drinks of alcohol/day, current pregnancy, and living outside of the preselected study neighborhoods.

Intervention - The physical activity intervention consisted of cell phone-based messaging and access to a cell phone-based Facebook private group site focused on PA. The attention control group consisted of similar procedures focused on good nutrition. Following randomization, participants attended a single introductory face-to-face meeting for their respective group to obtain an orientation to the program activities and meet fellow participants.

Assessments - In-person assessments of outcomes were conducted at baseline and post-program (8 weeks). Objective measures included body mass index, waist circumference and blood pressure. Participants self-reported physical activity and nutrition using validated measures.

Statistical Analysis - ANCOVA was used to compare study groups, adjusted for baseline values on outcome measures.

Results: Most participants were women, white, middle-aged, and obese. No significant differences were observed between groups at baseline, suggesting successful random assignment. 88% of participants completed the post-program assessment. PA group participants had a significant increase in PA when compared to control participants, including 85.2 MET (Metabolic Equivalent of Task)-minutes/week more of leisure-time activity (P<0.03). Participants in the PA group also had a statistically significant (P<0.006) decrease in waist circumference of 2.1 cm (3.62, 0.62) from baseline. Further, participants were actively engaged in the study’s website. Almost two-thirds of participants engaged in discussion on the study’s Facebook page at least every other week. The program received excellent reviews, with almost all participants (92%) stating that they would recommend the program to other people.

Conclusions: We demonstrated the feasibility and initial efficacy of a cell phone-based intervention using Facebook to engineer social networks to improve engagement in PA. Future studies are necessary to determine the longer-term effects of this intervention on PA and objective measures of health.