Improving Physical Activity Levels Through an Automated Telephone Counseling System

Pinto BM, Friedman R, Marcus BH, et al. Effects of a computer-based, telephone-counseling system on physical activity. Am J Prev Med 2002;23:113–20.

Study Overview

Objective. To develop and evaluate a fully automated, telephone delivered, physical activity (PA) counseling system

Design. Randomized controlled trial with an intention-to-treat analysis.

Setting and participants. The study was conducted in a single large multisite, multispecialty group practice in Massachusetts. Out of 4364 patients seen at the practice, a random sample of 2884 were contacted. Of these 2884 patients, 1738 (60%) completed the screening, 609 were eligible, and 298 enrolled (49% of those screened). Exclusion criteria included age less than 25 years, engaging in any regular exercise, consuming a healthy diet, and any medical condition that might interfere with a participant's ability to complete the intervention or make the advice offered by the intervention inappropriate.

Intervention. Counseling was delivered through a telephone-linked communication system over a 6-month period. The intervention was automated and interfaced with study participants through computer technology and digitized human speech. The computer program asked questions, recorded the response, commented on this response, and educated the users based upon their responses. Participants responded to these questions via their telephone keypad. Participants initiated all calls. They were expected to call in once a week for the first 3 months, followed by at least bi-monthly calls afterwards. The intervention group received automated counseling targeted at increasing moderate intensity physical activity. The control group received nutrition counseling through the same technology. There was no overlap of content between the 2 groups.

Main outcome measures. The main outcomes included total energy expenditures, percentage of participants meeting appropriate recommendations for moderate-intensity physical activity, and motivational readiness for PA. Energy expenditures were calculated using metabolic equivalents derived from a 7-day physical activity recall questionnaire. Motivational readiness was assessed by a 5-item survey. Data were collected at baseline, 3 months, and 6 months.

Main results. 150 participants were randomized to the intervention group and 148 to the control group. There were no statistically significant differences between the 2 groups with respect to age, sex, mean body mass index, or education. Over the 6-month study period, 50 (33%) participants in the PA counseling group did not call the system at all; 49 (33%) made only 1 to 5 calls; 19 (13%) made 6 to 10 calls; 26 (17%) made 11 to 20 calls; and only 6 (4%) made more than 20 calls. In the intention-to-treat analysis, individuals assigned to the PA counseling intervention were more likely to meet the recommended levels of physical activity at 3 months (26% compared with 19.6%; $P = 0.04$) than those assigned to the dietary counseling intervention. All other outcomes were nonsignificant between the 2 groups at 3 and 6 months.

The authors performed a secondary analysis including only the individuals who had completed the study. At 3 months, the PA counseling intervention group had a greater caloric expenditure than the dietary counseling group (mean, 2.3 kcal/kg/day compared with 2.0 kcal/kg/day; $P = 0.02$). This effect was not significant at 6 months. With respect to patients meeting recommended PA levels, 27.1% of individuals receiving PA counseling met the recommended levels versus 18.1% in the dietary group ($P = 0.03$) at 3 months. Again, this effect was not significant at 6 months. Finally, while the PA counseling group had a more advanced level of motivational readiness than the dietary counseling group (52.5% versus 42.2%; $P = 0.04$), these results were not significant at 6 months.

Conclusion. This fully automated, telephone-counseling system seemed to have improved PA behavior in sedentary individuals at 3 months, but the effect was not sustained. The lack of benefits might have resulted from a drop off in the usage of the system.

Commentary

Good evidence supports the benefits of physical activity on health outcomes, yet most adults either do not exercise or

exercise below recommended intensity levels [1]. While personalized patient-physician counseling is considered a useful intervention for increasing physical activity levels, this level of counseling requires substantial time commitments and may be impractical in a busy practice. However, recent technological advances might offer a potential solution to these problems. Pinto et al have evaluated a fully automated, telephone-linked counseling system that attempts to promote physical activity. The system is driven by user responses, allowing it to deliver information specifically targeted for the individual user.

While the potential benefits of the system are large, unfortunately no sustained response was seen. Use of the system dropped off significantly during the final months, which might have contributed to the lack of effect. However, as the authors point out in a subanalysis, no "dose effect" was seen. This result would suggest the people who called in to the system multiple times were no more likely to increase their physical activity levels than those who rarely called in. While this lack of dose effect calls into question the utility of the intervention, it might have resulted from a lack of statistical power.

Applications for Clinical Practice

Automated, telephone-linked counseling strategies may have potential to influence patient behavior, but the effect is short-lived. More research is necessary to understand the barriers to sustained usage if these strategies are to be implemented in clinical practice.

–Review by Harvey J. Murff, MD, MPH

References

1. From the Centers for Disease Control and Prevention. Physical activity trends—United States, 1990–1998. JAMA 2001; 285:1835.