Stanford University

20 Years of Research
On Phone Coaching for Physical Activity

"Research on telephone-assisted counseling for physical activity has established a convincing body of evidence supporting its effectiveness in promoting long-term physical activity change in adult populations," according to the Stanford University review article, Telephone-Assisted Counseling for Physical Activity, by Abby King, Ph.D. and Cynthia Castro, Ph.D.

Proof Phone Coaching Works...

(1) for patients with uncomplicated, postmyocardial infarction
(2) for healthy adults
(3) for special populations
(4) for seniors
(5) for high exercise adherence rates of 75%-90% (unheard of in the fitness industry)
(6) more sustainable on a long-term basis
(7) more positive impact on percieved levels of stress
(8) for cardiovascular, flexibility AND strength training
(9) for higher-intensity exercise and resulting higher VO2max
(10) for lower-intensity exercise and resulting increase in VO2max
(11) more advantageous for busy, fast-paced lifestyles and those who travel
(12) the opportunity in telephone-based exercise counseling now and in the future

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Telephone-Assisted Counseling for Physical Activity

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Different methods of intervention have been tested to promote physical activity at the individual level. The telephone is an excellent form of media for delivering exercise counseling and advice. This review highlights important clinical trials that have

documented the success of telephone-assisted exercise counseling for promoting physical activity in a variety of populations.

Introduction

It is established that regular physical activity helps to control or to reduce the risk for some chronic diseases and improves physical and psychological functioning. Despite well-known benefits, the majority of adults do not achieve recommended levels of physical activity. Thus, many methods have been explored to promote physical activity, with varying degrees of success.

Physical activity programs that intervene at the individual level are popular in health promotion. Different communication channels have been tested to promote physical activity on an individual basis, the most traditional channel being face-to-face counseling conducted either individually or in groups. In light of the staff- and time-intensiveness of face-to-face approaches, mediated forms of interventions (i.e., print- or telephone-based approaches) have been increasingly evaluated. The relative advantages and disadvantages of different communication channels are outlined in Table 1.

Table 1

Factors associated with three common exercise counseling communication channels

	Face to Face	Telephone	Print
Physical cues	+		
Verbal cues	+	+	
Multiple, simultaneous cues	+	+	
Immediate feedback	+	+	
Natural language	+	+	
Interpersonal, social connection	+	+	
Individually-tailored information	+	+	+
Nonverbal cues	+	+	+
Density of information	+	+	+
Independent of geographical distance	+	+	
Least staff time burden	+		
Low cost	+		
Largest volume of recipients	+		

Face-to-face contact is considered the "richest" form of communication, followed closely by the telephone. Though telephone contact can be more time consuming and dependent on staff resources than mail, the telephone is typically more readily available, convenient, and less burdensome with respect to travel and time constraints) than face-to-face contact for staff and participants alike. Thus, the telephone is an ideal alternative

to face-to-face contact as a medium for physical activity promotion.

The Telephone as a Delivery Channel for Exercise Counseling

In the past two decades, a programmatic line of research has been used to develop an intervention model that uses the telephone as the main communication channel to deliver advice and support to adults attempting to increase physical activity participation. The dynamic of this intervention model is illustrated in Figure 1.

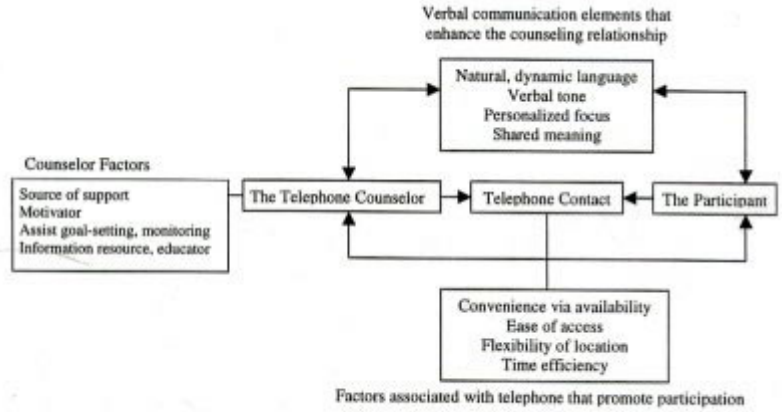

Figure 1. A model of telephone-assisted exercise counseling.

The intervention has been shaped by several theoretical perspectives, most notably Social Influence theory, Social Cognitive theory, and the Transtheoretical model. Although each theory has some unique factors, there is also overlap between the three (e.g., the counselor's role as an influential role model and source of support, the use of goal-setting and self-regulatory techniques to achieve the desired behavior change), resulting in a complement of theoretical components that influence the counseling process.

The counselor qualities are not unique to telephone-assisted interventions; rather, they should transcend any communication modality. Likewise, elements of spoken language enhance the process (but are not limited to the medium of telephone), and include the preexisting, "natural" elements of verbal communication, particularly the dynamic flow of spoken language, the use of tone and verbal cues to convey meaning, the ability to develop a personalized focus in a one-on-one discussion, and the mutual creation of a shared meaning between the counselor and participant.

As displayed in Figure 1, **(11)** the unique, advantageous aspects of telephone-assisted counseling include the increased convenience of availability and access (i.e., participant and counselor are not limited by geographic distance, transportation, or access to facilities), increased opportunities for contact anywhere a telephone is accessible, and increased time efficiency (e.g., no need for travel time). Thus, the most attractive elements of telephone communication are combined with the counselor's skill and resources to promote physical activity participation among individuals who may not be receptive to face-to-face or print media.

Telephone-Assisted Physical Activity Intervention Trials—A

Review

Research on telephone-assisted counseling for physical activity has established a convincing body of evidence supporting its effectiveness in promoting long-term physical activity change in adult populations. The following review highlights key exemplars of telephone-assisted physical activity interventions. All of the studies reviewed implemented the telephone-based exercise counseling in a similar manner that is briefly summarized here.

Although telephone calls composed the vast majority of contact between participant and staff, an important caveat is that the intervention was not entirely implemented via the telephone. Every participant began the intervention with an initial, introductory, face-to-face session with a health educator to receive an individualized exercise prescription based on current physical status and functioning. Initial short- and long-term goals and expectations were structured, and the participant was given written information (e.g., tips on stretching, activity tracking logs, resources for exercise opportunities in the local area) to supplement the discussion. The initial session was then followed by regular telephone contact initiated by the health educator throughout the remainder of the intervention. Although the frequency and duration of the telephone calls varied slightly, the typical schedule of calls progressed from weekly to biweekly then monthly contacts for the duration of the intervention.

Research on telephone-assisted exercise counseling began with the Stanford Cardiac Rehabilitation Program under the direction of Robert DeBusk, M.D. **(1)** In this landmark study, 127 male patients with uncomplicated, postmyocardial infarction (postMI) were randomly assigned to one of four conditions: 1) a structured, home-based exercise program supervised via regular telephone contact with a nurse, 2) a traditional treatment of medically supervised group exercise classes, 3) early exercise treadmill testing only (3 wk postMI), or 4) delayed treadmill testing only (26 wk postMI).

The home-based, telephone-supervised program consisted of one face-to-face visit whereby the patient received an exercise training prescription and initial instructions, with telephone follow-up initiated by the project nurse twice weekly for the length of the intervention. Participants also returned written exercise logs, which were reviewed with the nurse during the telephone contacts. At the end of the trial, patients in both the home- and group-based training conditions achieved similar increases in functional capacity and exercise adherence in their respective conditions, and experienced similarly low rates of reinfarction and dropout. This trial was the first to document that home-based, telephone-supervised exercise programs could successfully and safely rehabilitate low-risk cardiac patients, while also increasing availability to a wider patient population and decreasing program-related costs associated with supervised, group-based, or facility-based exercise.

(2) Telephone-assisted counseling for exercise was subsequently tested in healthy adults. In the Stanford/Lockheed Exercise Study, the home-based, telephone-supervised physical activity model program was tested among a sample of 120 healthy middle-aged and older men and women who were randomized to either a 24-wk home-based, telephone-supervised exercise condition or a control condition.

(10) As in the first study, the intervention began with a face-to-face instructional session in which exercise was prescribed for 5 d-wk-', performed at 65-75% of peak

treadmill heart rate. The initial session was followed by biweekly, staff-initiated telephone contact to review progress and track activity.

(5) At the 24-wk evaluation, the intervention group showed significant improvements in functional capacity relative to the control group (15% net VO2max increase in men, 9% in women), high exercise adherence rates (90% for men, 75% for women), and 1.5-kg body weight decreases in men. This study replicated the cardiac rehabilitation results and demonstrated functional improvements from telephone-supervised, moderate-intensity exercise in healthy, community-dwelling individuals. This study also indicated that home-based, telephone-mediated programs were viable alternatives for the large percentage of adults who cannot or choose not to engage in group-based exercise.

Whereas these two early studies were important for establishing the short-term physiological benefits gained from telephone-supervised physical activity, the long-term effects of telephone-based exercise counseling were documented in the 2-yr Stanford/Sunnyvale Health Improvement Project I (SSHIP-I,). Men and women aged 50-65 yrs were randomized to either 1) supervised, higher-intensity i.e., 70-85% of peak heart rate) group exercise classes 3 d-wk-', 40 min per session, 2) home-based, higher intensity exercise 3 d-wk-', 40 min per session, 3) home-based, moderate-intensity (i.e., 60-75% of peak heart rate) exercise prescribed 5 d-wk-', 30 min per session, or 4) a wait list control condition. In the home-based conditions, participants were encouraged to exercise on their own, and received weekly, biweekly, then monthly telephone-counseling contacts from a health educator to assist with exercise tracking, building self-regulatory skills, and preventing relapse. After year 1, participants in all three exercise conditions significantly improved Vo2max and treadmill duration compared with those in the control condition.

(9) At the end of year 2, participants in all exercise conditions maintained improvements in functional capacity, but the home-based, higher-intensity condition participants demonstrated a greater increase in Vo2max relative to the participants in other conditions. Lipoproteins were unaffected by exercise after year 1, but participants in both home-based exercise conditions showed significant increases in high density lipoprotein (HDL) from baseline to year 2, whereas HDL in participants in the group-based condition did not change.

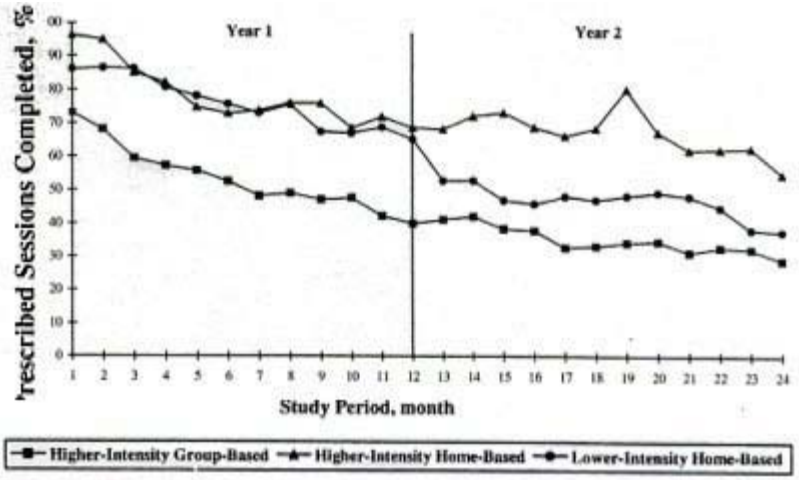

Figure 2.
SSHIP-I. Line plot shows monthly adherence rates (percent of prescribed exercise ses-sions completed) across the 2-yr period by exercise training condition assignment. Note: During year 1, group-based training condition differed from the other two conditions at P < 0.0005. During year 2, higher-intensity, home-based training con-dition differed from the other two conditions at P

As shown in Figure 2, **(6)** participants in both home-based exercise conditions achieved substantially better exercise adherence rates than did those in the group-based condition in year 1 (with the higher-intensity home-based program, in particular, showing high adherence rates through year 2), suggesting that home-based exercise with telephone-assisted supervision is more sustainable on a long-term basis than traditional, class-based exercise. **(7)** In addition, the telephone-supervised, home-based regimens had a significant, positive impact on ratings of perceived stress and other psychological outcomes.

(3) Additional trials have tested the efficacy of telephone-assisted exercise counseling in special populations. Recently, telephone-based exercise counseling was implemented for older women caring for relatives with dementia. The chronic physical and psychological burdens experienced by this rapidly growing segment of women can often impair their health and limit their ability to take advantage of exercise classes or facilities. In the Teaching Healthy Lifestyles for Caregivers (TLC) trial, 100 women were randomized to either 12 months of home-based, telephone-supervised exercise counseling or 12 months of an attention-control condition focused on nutrition education.

At the end of the trial, women in the exercise condition significantly increased total energy expenditure by 2.1 kcal-kg-'-d-', translating into approximately an additional 5 hr-wk spent in physical activity, with at least half of that time spent in moderate or greater intensity exercise. After 1 yr, women in the exercise condition also showed significant reductions in stress-induced blood pressure reactivity in response to caregiving, and showed significantly improved sleep quality relative to women in the comparison condition. These results demonstrate that a telephone-assisted exercise

program can be successfully implemented for a high-risk, burdened population, and can produce beneficial effects within 1 yr.

(4) Finally, telephone-supervised physical activity was tested as part of a public health outreach model in the Community Healthy Activities Model Program for Seniors II (CHAMPS II). Adults aged 65 yrs and older who were enrolled in two Medicare health maintenance organizations were randomized to either a 1-yr physical activity promotion condition or a wait list condition. Those in the intervention were encouraged to increase physical activity by increasing home-based exercise and participating in pre-existing community exercise classes and programs. Participants completed one face-to-face session to receive initial, individualized exercise prescriptions followed by regular, staff-initiated telephone contact, monthly newsletters, and offers to participate in monthly group workshops.

After 1 yr, the intervention group significantly increased both total energy expenditure from all activities, and from activities of at least moderate or greater intensity (an increase analogous to five 20-min brisk walks per wk) than the comparison group. The intervention was especially successful for the older age groups (75+ yrs), women, and overweight individuals, further adding to the evidence that interventions involving telephone-assisted exercise counseling can be useful for specialized populations.

With the efficacy of telephone-assisted exercise counseling established, additional research has examined the importance of the timing of telephone contact during the adoption versus maintenance phases of physical activity. For example, in SSHIP-I, participants in both home-based exercise conditions were re-randomized at the start of year 2 to receive additional telephone contact or predominantly mail contact for year 2 of the trial.

All participants maintained approximately two-three weekly exercise sessions in year 2; those who received telephone contact in the maintenance phase did not demonstrate significantly better exercise adherence than those who received predominantly mail contact. Results from both the earlier-described Lockheed study and SSHIP-I suggest that telephone contact appears most effective at the critical, early stages of exercise adoption. If participants successfully adopt a more active lifestyle with early telephone-assisted counseling, it appears that they may be able to maintain activity through less-intensive mediated programs (e.g., print).

In the Fitness and Arthritis in Seniors Trial (FAST), telephone-based exercise counseling was used as a "transitional" intervention for older adults with knee osteoarthritis randomized to either 1) aerobic exercise, or 2) resistance exercise. Both interventions consisted of 3 months of supervised, facility-based instruction, followed by 15 months of home-based, telephone-assisted exercise. Participants in both exercise conditions demonstrated adherence rates of 68-70% over the course of the intervention, and reported improvements in disability, physical functioning, and pain at 18 months.

(8) Telephone-supervised, home-based strategies have been used as effective adjuncts to group-based exercise in other older adult samples, resulting in significantly greater sustained adherence rates for home-based versus group-based exercise. As shown in Figure 3, better home-based exercise adherence rates were found for both a home-based endurance and strength training program and a home-based stretching/flexibility

program.

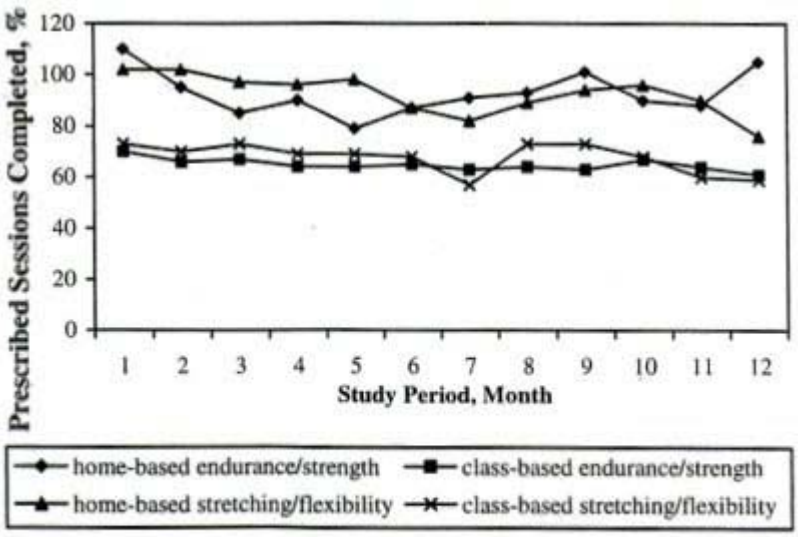

Figure 3. SSHIP-II. Line plot shows monthly ad-herence rates (percent of prescribed exercise ses-sions completed) across a 1-yr period by exercise training condition assignment.

Future Directions

Although research has clearly documented telephone assisted exercise counseling as effective and beneficial, more work is needed to better understand how or why the interventions work, and what factors may moderate their effectiveness in different population segments. It appears that the greater convenience and flexibility afforded by telephone as opposed to face-to-face channels may be important factors for many individuals. It is less clear, however, which segments of the population may require even less intensive counseling (as can be delivered via print) or, conversely, which may require the additional interactive support that face-to-face channels can provide. In addition, as with other interventions that have been developed in this field, relatively little data are currently available documenting specific psychological, behavioral, and environmental factors serving as potential mediators for such interventions.

As we begin to understand more about how mediated interventions work, future research can explore different permutations of telephone-mediated exercise counseling, such as interventions that rely solely on the telephone with no face-to-face interaction, or interventions that test different combinations or dosages of telephone, print, or face-to-face contact. Additionally, as cellular telephone technology, teleconferencing, and web-based broadcast technologies are expanded and refined, multiple opportunities will become available to explore how newer forms of mediated exercise counseling perform against the older standards.

Some research has already begun to test variations of telephone-assisted exercise programs, including the use of technologically advanced delivery vehicles. Currently, a clinical trial (the CHAT Project) is under way at Stanford University, in collaboration with the Boston and Brown University Schools of Medicine, in which health educator-initiated, telephone-based exercise counseling is being tested against an automated telephone

system. This automated system delivers exercise advice and stores keypad-entered data on participants' exercise goals and progress for future automated counseling. At Brown University, another clinical trial (Project STRIDE) is directly comparing the relative effectiveness of print-mediated versus telephone mediated programs to promote adoption and maintenance of physical activity.

As research on telephone-mediated exercise programs continue to grow, both in the United States and in other countries, efforts are moving toward outreach and dissemination. The California Department of Health Services (DHS) has made initial attempts to translate the current research into public health practice. In the early 1990s, the DHS distributed a training manual to assist local agencies in developing physical activity promotion programs. Much of the content of the "Get Going.1" manual was based on the clinical trials at Stanford, and it provides practical and technical guidelines for programs that use telephone-mediated exercise counseling. In addition, the DHS has recently awarded grants to over 15 communities to develop local, telephone-based physical activity programs under the state-wide Physical Activity & Health Initiative. Termed the Active Aging Projects, these communities are currently implementing telephone-supervised exercise programs in areas throughout the state of California.

(12) It is expected that telephone-based exercise counseling will continue to be a sustainable, accessible, and cost-effective method for physical activity promotion in both research and public health settings. Given the need to increase rates of physical activity, telephone-based exercise counseling and similarly mediated approaches will likely continue to gain in acceptance and use.

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