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# Walking for our health: couple-focused interventions to promote physical activity in older adults

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# Walking for Our Health:

# Couple-Focused Interventions to Promote Physical Activity in Older Adults

## Abstract

More than 50 percent of U.S. adults do not engage in sufficient physical activity to meet current recommendations, making physical activity change and maintenance a priority for health promotion throughout adulthood. Among married partners, change in physical activity of one partner often is concordant with change of activity of the other. The primary purpose of this study was to examine two couple-focused interventions that capitalize on the co-occurrence of health behavior change within couples to promote physical activity in older adults. In this study, partners (N = 31 couples) participated together in assessment and intervention activities, and were randomized together into one of two couple-focused conditions. In one condition (concurrent), standard goal-setting techniques were extended to a couple-focused design with each partner setting daily step goals and monitoring her or his own progress. In the other condition (combined), partners collaborated to set and monitor shared daily step goals. Physical activity was assessed with accelerometers pre- and post-intervention. Post-intervention, average weekly physical activity increased by 58 minutes ($p < 0.001$), and average body mass index (BMI) decreased by 0.50 kg/m$^2$ ($p = 0.001$), from pre-intervention measures. Similar levels of change in weekly physical activity and in BMI were detected in both intervention groups. Furthermore, participants demonstrated high adherence to the intervention protocol. Results suggest that couple-focused physical activity interventions can be effective in eliciting increases in physical activity among older adults. Further research is needed to uncover interpersonal mechanisms that maximize physical activity promotion and maintenance within couples over time.


Keywords: couple-focused intervention, physical activity, aging, walking

# Walking for Our Health:

## Couple-Focused Interventions to Promote Physical Activity in Older Adults

The established benefits of physical activity, including sustained physical health, improved disease management, and enhanced quality of life, are not being realized by many midlife and older adults (Carlson et al. 2010). More than 50 percent of U.S. adults do not engage in sufficient physical activity to meet current recommendations (Carlson et al. 2010, Hall et al. 2017), making physical activity change and maintenance a priority throughout adulthood. Among those who are married, a behavior change by one partner, including increasing physical activity, is associated with a corresponding change by the spouse (Arden-Close and McGrath 2017, Jackson, Steptoe, and Wardle 2015). Increasingly, interventions to promote physical activity acknowledge couple concordance in health behavior change and incorporate involvement of spouses in the behavior change process (Richards et al. 2018). Capitalizing on recognized health behavior concordance between married partners, two couple-focused interventions designed to promote physical activity change among older couples were examined in this investigation.

Correspondence in health behaviors of married partners may result from selection of spouses with similar health beliefs and habits, partners' shared decision-making and collaboration to reduce health risk behaviors, and efforts of one partner to influence or exert control over the health choices of the other (Arden-Close and McGrath 2017, Lewis et al. 2006, Martire and Helgeson 2017). In their integrated conceptual framework based on Interdependence theory and communal coping approaches, Lewis and colleagues (2006) posit that couple correspondence in health behavior may be due, in part, to each partner incorporating the health needs of the other into her or his own motivation to adopt a healthier lifestyle. Further, partners'

can benefit from one another's efforts to make healthier lifestyle choices (Jackson et al. 2015). For instance, one partner's confidence to make a desired health behavior change, i.e., be more active, is linked with the spouse's readiness to make a similar change (Franks et al. 2012). Additionally, making plans with a family member or friend for being active together (i.e., collaborative implementation intentions; Prestwich et al. 2012) is associated with increased physical activity.

In the current study, goal-setting strategies (i.e., setting specific goals and monitoring goal progress; McEwan et al. 2016, Shilts, Horowitz, and Townsend 2004) were a key component of two couple-focused interventions designed to promote physical activity change in older adults. In one couple-focused goal-setting intervention (i.e., concurrent), each partner set and monitored her or his daily step goals concurrent with the partner's independent engagement in identical goal-setting activities. In the other couple-focused goal-setting intervention (i.e., combined), partners collaborated to set and monitor shared daily step goals. It was expected that couples in both couple-focused goal-setting interventions would increase their physical activity (assessed objectively with accelerometry). Drawing from theoretical work on behavior change of couples (Lewis et al. 2006), it was anticipated that partners working together toward a common goal would show a greater increase in weekly physical activity than partners who set and monitored daily step goals independently.

## Methods

### Participant Recruitment

Participants (31 couples) were recruited through flyers, newsletters, and a newspaper advertisement to reach community-dwelling older adults near a Midwest University in the United States (see Figure 1). Potential participants were screened for eligibility: 1) at least one partner

50 years of age or older, 2) partners living together in a committed relationship, and 3) at least one partner was encouraged by a healthcare provider to increase physical activity in the past year. The following exclusion criteria were also employed: 1) unable to speak/understand English, 2) partner unwilling to participate, and 3) failed the screening to identify contraindications to participating in physical activity or did not receive physician clearance to participate. This study was approved by the University Institutional Review Board.

**Intervention Procedures**

Partners participated together in all intervention procedures. At a baseline meeting, participants provided written informed consent and completed self-report questionnaires, BMI measures, and were fitted with an accelerometer to wear for one week to establish baseline physical activity. Partners were then randomized together into one of two treatment conditions, a concurrent individual (n = 14 couples) or a combined couple (n = 17) goal-setting condition. Briefly, in the concurrent individual goal-setting group, standard goal-setting techniques were applied to a couple-focused design with each partner setting daily step count goals and monitoring her or his own progress. In the combined couple goal-setting group, each partner recorded her or his daily steps that were then summed to form a shared daily step goal and progress was monitored jointly.

One week after the baseline assessment, participants attended a 60-minute group education session (delivered separately to groups of couples in each condition). Topics included: benefits of walking, national physical activity guidelines, walking safety, pedometers and tracking steps, goal setting, and tips to prevent setbacks. Each participant was provided a pedometer to self-monitor daily step counts over the next eight weeks (retained at the end of the study).

Participants received a weekly phone call from trained research staff to report daily step counts and to facilitate goal setting for the upcoming week. Partners in the concurrent individual group were contacted separately from one another each week, and partners in the combined couple condition were contacted together. Individuals (or couples) who met their daily step goal on 5 or more days were encouraged to increase their step goal by up to 10 percent. Those who did not meet their daily step goal were encouraged to pursue the same goal for another week. After the eight-week intervention period, participants (28 of the initial 31 couples) returned to complete follow-up assessments and were asked to wear an accelerometer for the next seven days to assess physical activity at follow up.

**Measures**

**Physical Activity.** To assess weekly minutes of moderate-to-vigorous physical activity (MVPA), participants were asked to wear an Actigraph™ GT3X accelerometer for one week at baseline and again for another week at follow-up. Accelerometer data were screened for valid wear time using ActiLife6® software. Nearly all participants had the minimum four days of valid accelerometer wear time (with a minimum of 10 hours a day) at baseline (98.4%) and post-intervention (92.8 %) (Troiano et al. 2008). Activity intensity was established using cut-points derived specifically for older adults (Copeland and Esliger 2009).

**Body Mass Index (BMI).** Height and weight were measured at baseline and weight was measured again post-intervention. BMI was calculated using the following formula: weight (kg)/height ($m^2$).

**Covariates**. Assessment of demographic information included age, sex, race/ethnicity, highest level of education, annual household income, and current employment status. Number of chronic conditions (e.g., diabetes, hypertension, myocardial infarction, stroke) was assessed by

self-report. Relationship satisfaction was assessed using five items modified from the Quality of Marriage Index (0=strongly disagree; 6=strongly agree) (Norton 1983).

**Analyses**

Descriptive statistics were used to summarize participant characteristics and intervention adherence. To assess change in MVPA, a mixed-effects (3-level) model with covariates was estimated with a couple level random intercept and an individual level random intercept to adjust for nesting of individuals within couple and time within individual, respectively. The change slope was also allowed to vary randomly across individual and/or couples when this random slope had statistically significant variance. A test of intervention group difference in the change over time was assessed using a group-by-time interaction. Although the focus of this study was change in physical activity, change in BMI also was examined. For these analyses assessing change over time, participant observations were used at each time point (pre-intervention and post-intervention) if they had no missing values on any of the model variables. Power analyses for this study indicate that with 31 couples and two time points using a mixed effects model with 8 covariates and alpha = 0.05, we could detect a small to medium standardized beta coefficient of 0.12 for the BMI models and 0.20 for the MVPA models with power $\geq$ 0.80.

## Results

Sample characteristics are provided in Table 1. No significant differences (at $p < .05$) in baseline physical activity level or demographic characteristics were detected between groups. A significant difference in the number of chronic conditions was detected between groups, however. On average, participants in the combined couple group reported fewer chronic conditions than did participants in the concurrent individual group ($p = .03$).

In regard to intervention adherence, all couples completed baseline assessments and attended the education session. Adherence to physical activity assessment with the accelerometer also was very high as noted earlier. Average wear time was 838.1 minutes/day at baseline and 839.3 minutes/day at follow-up.

**Physical Activity and BMI**

Across the 10-week intervention period, average weekly MVPA increased by 58 minutes (95% CI: [25, 90]; $p < 0.001$) overall (See Figure 2). Average weekly MVPA increased by 66 minutes (95% CI: [21, 111]; $p < 0.01$) for those in the concurrent individual group and by 49 minutes (95% CI: [3, 96]; $p < 0.05$) for those in the combined couple group. Contrary to anticipated group differences, the level of increase in weekly MVPA did not differ between the two intervention groups (b = -16; 95% CI: [-81, 49]; $p = 0.62$).

On average, participants' BMI decreased by 0.50 (95% CI: [-0.80, -0.21]; $p < 0.01$) across the intervention period. BMI decreased by 0.57 on average (95% CI: [-0.99, -0.16]; $p < 0.01$) for those in the concurrent individual group and by 0.43 (95% CI: [-0.86, 0.01]; $p = 0.06$; $\beta = -0.032$) for those in the combined couple group. Detected decreases in BMI were not significantly different between the two intervention groups (b = 0.14; 95% CI: [-0.45, 0.75]; $p = 0.63$; $\beta = 0.007$).

## Discussion

Findings revealed improvement in physical activity in both intervention groups and suggest that couple-focused interventions designed to engage both partners in health behavior change have potential to be effective in increasing physical activity. Notably, although physical activity change was expected to be greater in the combined couple intervention group than in the concurrent individual intervention group, no significant difference in change over time in

physical activity was detected between the two intervention groups. Likewise, detected decreases in BMI also did not differ between the two intervention groups.

It was anticipated that, for partners in the combined couple group, working together toward a common goal would facilitate greater improvement in physical activity compared to partners pursuing behavior change independently in the concurrent individual group. Despite this expectation, a comparable level of improvement in MVPA was detected across the two groups. The detected increase in physical activity of both groups may be due to comparability in participants' motivation to be more active. Given that study eligibility required that at least one partner had been encouraged by a healthcare provider to increase physical activity, it is likely that couples in both groups shared the overarching goal of increasing physical activity to better adhere to treatment recommendations. It also is possible that the goal-setting activities in each intervention condition, whether concurrent or combined, generated similar supportive interactions that enhanced physical activity behavior change in both groups of couples. For instance, partners in the concurrent group may have shared their individual goals with each other and worked together toward their goals in a similar manner as the combined couple group contributing to a comparable increase in physical activity between the two groups.

To the extent that interpersonal interactions facilitate the behavior change process, it is important to consider that some couples may benefit from engaging in a collaborative couple-focused approach more than other couples (Arden-Close and McGrath 2017, Martire and Helgeson 2017). For instance, partners who are similar in their readiness to be more active or those who desire similar levels of physical activity may be more responsive to a collaborative couple-focused approach and may be more effective in providing support for increased physical activity to one another than those who are less similar (Hong et al. 2005, Lewis et al. 2006).

Additional research is needed to determine when, and for whom, a collaborative approach to behavior change shared with one's partner may be more beneficial than a concurrent approach focused on each partner independently.

This investigation had several strengths including high adherence to study procedures, objective assessment of physical activity, and appropriate analyses for data with a hierarchical structure. First, attendance rates were high at all sessions (baseline, group education, and follow-up), as was adherence to monitoring physical activity with accelerometers. Second, objective measures of phyiscal activity were used which provides more precise estimates of both intensity and duration of physical activity compared to self-report measures (Sallis and Saelens 2000). Finally, analyses were conducted using mixed-effects models adjusted for interdependence of repeated assessments and dyadic data. Nonetheless, study limitations also merit mention. The small sample of couples in long-term unions who were highly satisfied in their relationships limits generalizability of findings. It warrants mention that partners in this sample who elected to participate in a study of couples and behavior change may be more effective in working together than partners in the general population. Second, the small sample of couples recruited to this study precluded an opportunity to add a comparison condition that did not involve goal setting. Such a comparison condition would help to isolate features of these couple-focused interventions that were effective in promoting physical activity behavior change.

In conclusion, this study provides initial support that couple-focused goal-setting interventions can be effective in increasing physical activity among older adults, which is an important step toward promoting healthy aging. Further research is needed to identify couples who are likely to benefit more from a highly collaborative approach to behavior change together with their partner versus those likely to benefit more from an individualized approach to

behavior change that is synchronized with their partner. Understanding key interpersonal factors that contribute to engagement in regular physical activity not only can promote individual health, but also can reduce healthcare costs for older adults, their families, and society.

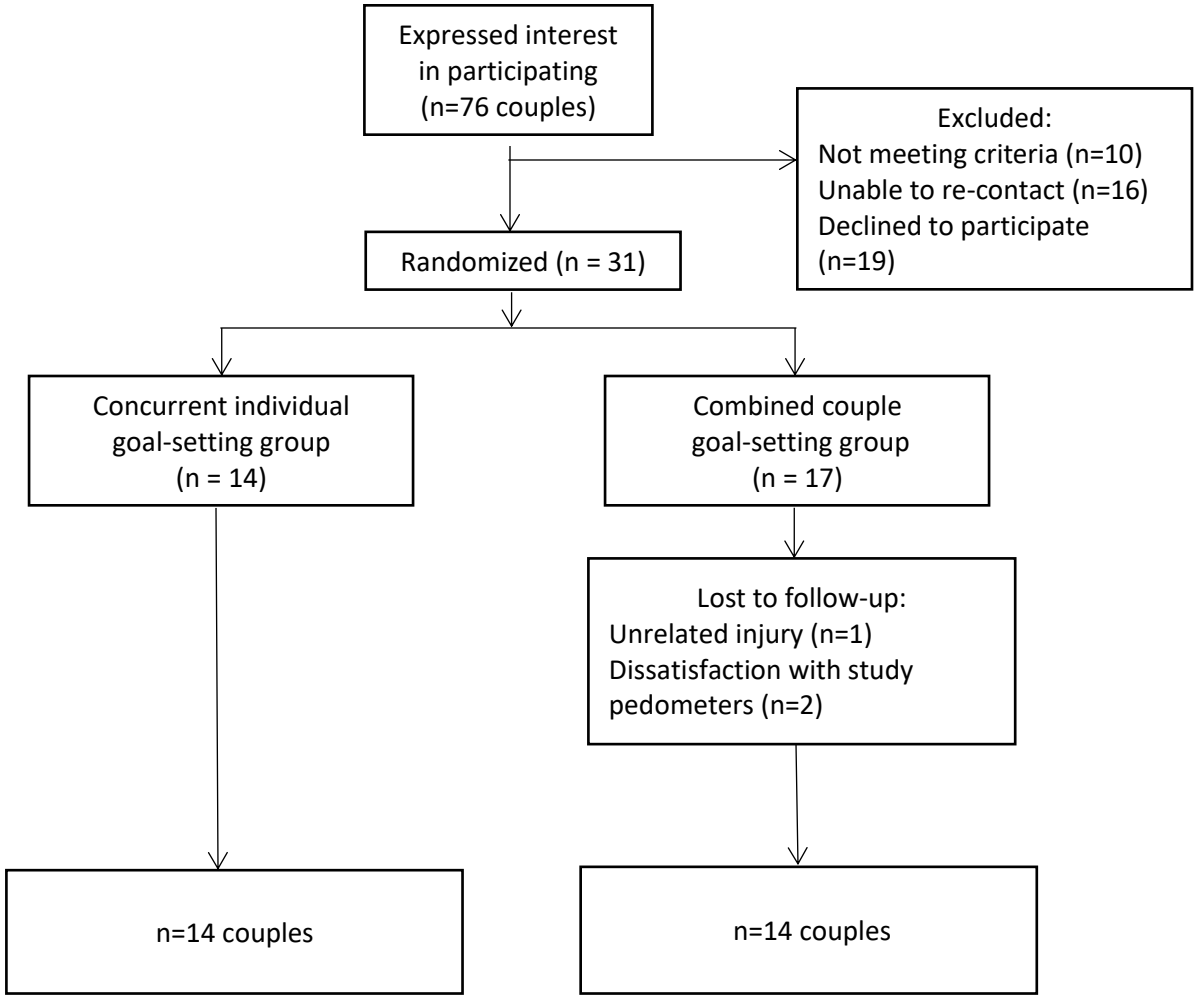


*Figure 1*. Participant flow chart.

Table 1

*Sample Characterisitcs*

| | Combined Couple (n =17 couples) | | Concurrent Individual (n = 14 couples) | |
|---|---|---|---|---|
| Characteristic | Husbands M (SD) | Wives M (SD) | Husbands M (SD) | Wives M (SD) |
| Age (in years) | 64.2 (10.2) | 61.5 (8.9) | 68.6 (7.7) | 65.6 (8.1) |
| Number of Chronic Conditions | 0.65 (0.86) | 0.82 (0.81) | 2.1 (1.3) | 1.3 (1.2) |
| Weekly Minutes Moderate-Vigorous Physical Activity at Baseline | 78.2 (96.1) | 59.9 (94.5) | 89.9 (122.1) | 79.2 (88.6) |
| Relationship Satisfaction* | 26.9 (4.2) | 23.1 (9.7) | 25.1 (8.1) | 27.7 (3.4) |
| Marital Status (Married) | 100% | | 93% | |
| Mean Years in Relationship | 32 years (range 3.5-62 years) | | 37.5 years (range 1.5-57 years) | |
| Median Household Income | $80,000 or above | | $60,000-79,999 | |
| Race/Ethnicity (non-Hispanic white)+ | 94.1% | 82.4% | 100% | 92.9% |
| Education | | | | |
| High school/ Some college | 35.3% | 41.2% | 42.9% | 57.2% |
| College graduate or higher | 64.7% | 58.8% | 57.1% | 42.8% |
| Currently Working for Pay | 47.1% | 58.8% | 35.7% | 35.7% |

* Scale range= 0-30; +n=31 for husbands; n=30 for wives

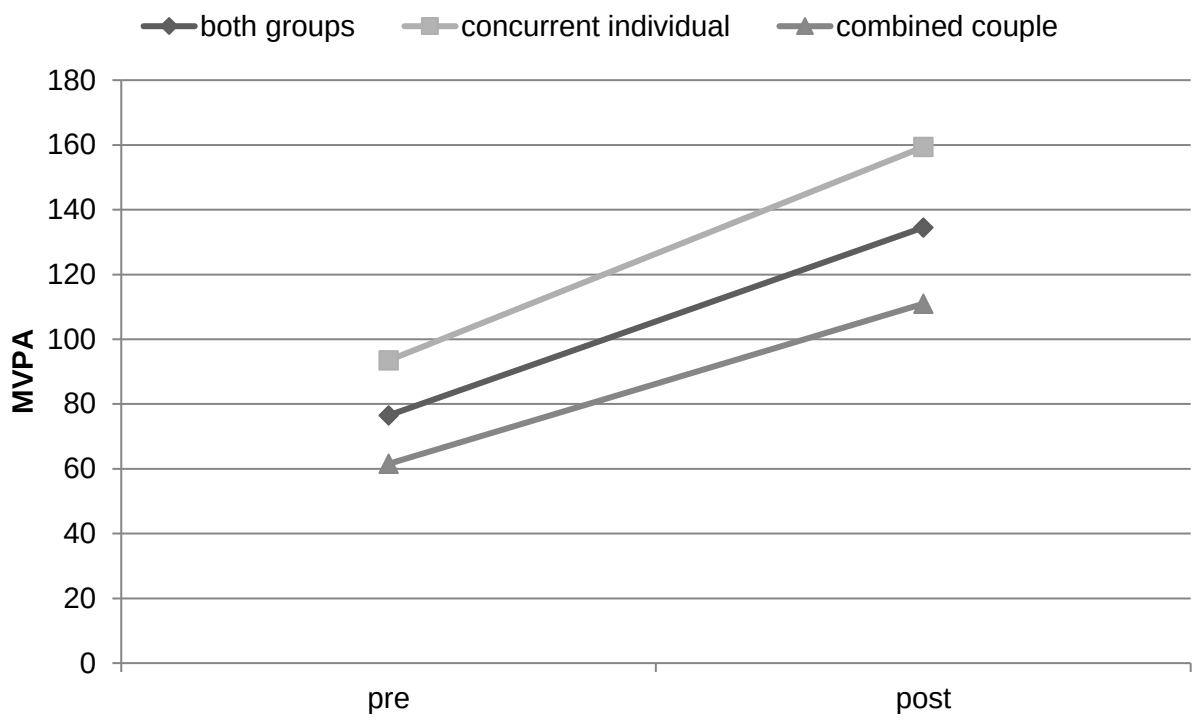


*Figure 2*. Change in weekly minutes of MVPA between baseline and post-intervention.

Note: MVPA= moderate-to-vigorous physical activity

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