Impact of an exercise program on adherence and fitness indicators

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ABSTRACT

Adherence to exercise is one of the most problematic health behaviors. This pilot study describes the impact of an exercise program on adherence to exercise and fitness indicators for overweight and obese adults enrolled in an insurance reimbursed exercise plan. Chart reviews were conducted retrospectively in a convenience sample of 77 subjects from a human performance lab (HPL) at a large southern university. Charts from 2004 to 2009 were reviewed for health history, fitness indicators (fitness level, weight, BMI, hip/waist ratio, % body fat, BP, HR, cholesterol), and adherence (number of exercise sessions/month). Exercise supervision was operationalized in two phases over 12 months: Phase I (3 months supervised exercise) and Phase II (9 months unsupervised exercise). Fifty-eight participants completed Phase I, and 8 completed Phase II. Six-nine percent of those completing Phase I visited the gym at least 8 times/month with significant ($\alpha = .05$) improvement in all fitness indicators. Those visiting <8 times/month had improvement in fitness level, weight, BMI, and % body fat. Twenty-four subjects continued into Phase II, with only eight completing Phase II. Of those eight, only one subject visited the HPL at least 8 times/month. Health history data including co-morbidities, symptoms, habits, perceived tension, job stress, and fitness level were not associated with adherence. Symptoms of swollen, stiff, painful joints, and swollen ankles and legs were associated with decreased adherence to exercise. Supervised exercise was positively related to adherence and improved fitness indicators. Adults with joint symptoms may require more support. Based on these pilot data, designing a study with a larger sample and the inclusion of barriers and facilitators for adherence to self-directed exercise would allow additional analysis. Innovative interventions are needed that mimic the supervised environment, shifting responsibility for the exercise plan from the supervisor to those exercising.

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1. Introduction

Adherence to exercise is one of the most problematic health behaviors (Linke, Gallo, & Norman, 2011). The majority of U.S. adults are not physically active at levels that promote health (CDC, 2014). Furthermore, physical activity levels show a significant decrease over the last two decades (King, Mainous, Carnemolla, & Everett, 2009). More than half of those who begin exercise programs to increase physical activity quit within six months (Allen & Morey, 2010). The benefits of exercise include the reduction in incidence of cardiovascular disease, improved blood pressure and lipid levels (Gilleland et al., 2006; Moore et al., 2006a; Moore, Seo, & Rosenthal, 2006b), and weight control (Abildso, Zizzi, & Reger-Nash, 2010).

Supervision has been shown to be effective in helping adults adhere to an exercise plan (Gilleland et al., 2006). However, dropout rates range from 25% to 80% within months after transitioning from a supervised exercise program (Moore et al., 2006b; Smart, Haluska, Jeffriess, & Marwick, 2005). Understanding how supervised exercise programs longitudinally influence adherence to exercise, and the factors that may influence success or failure to exercise, is necessary to assist persons meet the challenges of exercise self-management that promotes health.

The research question guiding this pilot study was: What is the impact of an exercise program on adherence to exercise and fitness indicators for overweight and obese individuals enrolled in an insurance reimbursed exercise plan? In addition, factors that affect success or failure in exercise self-management were identified.

2. Methods

2.1. Design/sample/procedures

Chart reviews were conducted retrospectively from a convenience sample of 77 adult participants (age 18–70) from a Human Performance Lab (HPL) at a large southern university health sciences center. Inclusion criteria included being a member of an insurance reimbursed exercise plan, and having a body mass index of ≥25 with a comorbid condition such as metabolic syndrome, hypertension, diabetes, heart disease, or sleep apnea. Charts from 2004 to 2009 were reviewed for demographic data (age, gender, occupational status, marital status, educational level), health history (past medical history, comorbidities, self-reported symptoms, medications taken, perceived stress, smoking,

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diet, alcohol consumption, perceived tension, perceived job stress and perceived physical fitness), fitness indicators (self-reported fitness level, weight, BMI, hip/waist ratio, percent body fat, blood pressure, heart rate, and blood cholesterol level), and adherence to exercise plan (number of exercise sessions per month attended).

Exercise supervision was operationalized in two phases over twelve months: Phase I (months one through three of supervised exercise), and Phase II (months four through twelve of unsupervised exercise). During Phase I, participants worked one-on-one with an exercise physiologist on an individualized exercise program during each visit to the gym. For Phase II, participants were expected to self-manage their exercise program, with gym staff available for consultation. To be adherent to the exercise plan, the participant visited the gym at least eight times per month. For each gym visit, the participant would sign in, be weighed, and have pre and post exercise vital sign (blood pressure and heart rate) measurement performed by gym staff. Exercise program expenses were reimbursed by the participant's insurance plan provided they remained adherent.

2.2. Statistical analysis

Analysis of data was done using SPSS, and included descriptive statistics (frequencies, means), correlations, and tests of difference.

3. Results

The sample characteristics included a mean age of 46.5 years, 71.4% female, 77.9% employed, 63.6% married, and 54.6% having graduated college. In terms of the impact of an exercise program on adherence, 58 (75.3%) completed Phase I of supervised exercise, with 40 (69%) adhering to exercise as defined by visiting the gym at least eight times per month. Twenty four (41.4%) of those who completed Phase I continued into Phase II of unsupervised exercise. Only eight participants (33.3%) completed Phase II, with only one adhering to exercise self-management by visiting the gym at least eight times per month.

In terms of the impact on fitness indicators, those who adhered to exercise in Phase I had significant improvements ($p = .05$) in all eight fitness indicators. Those in Phase I visiting the gym less than eight times per month (thus not adherent to exercise as defined in this pilot study) showed improvements in four of eight fitness indicators, including self-reported fitness level, weight, BMI, and percent body fat.

In terms of factors that affect success or failure in exercise self-management, self-reported symptoms of swollen, stiff, painful joints ($p = .01$), and swollen ankles and legs ($p = .02$) were associated with decreased adherence to exercise. Health history data including comorbidities, symptoms, habits, perceived tension, job stress, and fitness level were not significantly associated with adherence.

4. Discussion

In this pilot study, supervised exercise positively contributed to adherence to exercise self-management. The role of social support, whether in the form of a group program, friend, family, or interactions with a personal trainer, has been associated with enhanced physical activity and adherence to exercise (Allen & Morey, 2010). Three quarters of initial participants completed an exercise plan when supervised. However, when transitioned to the unsupervised environment, less than half continued participation. These results are similar to other studies of supervised and unsupervised exercise (Abildso et al., 2010). The participants in this study transitioned from a highly supervised environment that included health teaching about general health, exercise, and diet, to an unsupervised self-managed exercise plan with no additional intervention. Research suggests that exercise plans that involve minimal intervention and of longer duration contribute to high attrition from exercise plans (Linke et al., 2011).

Supervised exercise positively contributes to improvement in fitness indicators. These results are based on an adherence definition of a least eight gym visits/month. It is important to note that those participants who completed phase I but did not adhere to eight visits/month still had improvement in half of the fitness indicators addressing weight. Research suggests that multiple short episodes of exercise (10–15 min, two to three times per day), can be just as effective as traditional sustained exercise programs (30 min per day, three to five days per week) in terms of fitness measures (Murphy, Blair, & Murtagh, 2009). And while this pilot study did not analyze the adherence behaviors of those who attended less than eight times month, results suggest that some exercise makes a significant difference in some fitness indicators, specifically weight indicators.

Participants in this study had gym membership fees reimbursed if adherent to the exercise plan, evidenced by eight visits to the gym per month. However, the results suggest that insurance reimbursement was not enough of a motivator for self-management of exercise, even though the literature cites cost of gym membership as a barrier to exercise (Wycherley, Mohr, Noakes, Clifton, & Brinkworth, 2011).

Swollen, stiff, painful joints and swollen ankles and legs were the only self-reported health history data associated with decreased adherence to exercise plan. Health status and clinical condition factors have been shown to limit participation in physical activity and exercise (Allen & Morey, 2010; Santaularia & Jaarsma, 2013). For this study sample, adults with joint symptoms may require tailored interventions to facilitate self-management of exercise.

4.1. Implications for future research

This pilot study offers several areas for future research. To improve adherence to self-management of exercise, it is critical to identify factors that contribute to diminished adherence when transitioning to unsupervised settings. Based on these pilot data, designing a study with a larger sample and the inclusion of barriers and facilitators for adherence to self-directed exercise would allow additional analysis. The transition period marks a significant point in maintaining exercise for adults in supervised settings. Further exploration of this transition period is needed, including research exploring more gradual transitions from supervised to unsupervised exercise. Interventions to sustain exercise in the unsupervised period are needed. Innovative interventions are needed that mimic the supervised environment, and target shifting responsibility for the exercise plan from the supervisor to those exercising, with the long-term goal of sustainable behavior change. Studies that explore the impact of personalized exercise plans, and that facilitate social support may positively contribute to self-management of exercise in the unsupervised period. In addition, incorporating strategies to reduce physical symptoms that impact exercise is needed as part of personalized exercise plans.

5. Conclusion

Supervised exercise is positively related to adherence and improved fitness indicators. Clinicians should emphasize that improved health and fitness indicators may be attained for those who persist over time, regardless of frequency. Adults with joint symptoms may require more support. Innovative interventions are needed that mimic the supervised environment, and target shifting responsibility for the exercise plan from the supervisor to those exercising, with the long-term goal of sustainable behavior change.

References

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