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The gap between expectations and reality of exercise-induced weight loss is associated with discouragement

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Abstract

Background.—Exercise interventions result in modest weight loss, yet exercise is frequently prescribed for weight loss.

Purpose.—To identify individuals who become discouraged when exercise fails to achieve weight loss.

Methods.—Representative samples of U.S. adults were recruited using Google Consumer Surveys in August–October 2014. Respondents were asked about beliefs and potential discouragement regarding the role of exercise and weight loss. An analysis of variance was performed to predict individuals that become discouraged if exercise does not lead to weight loss.

Results.—The belief that exercise is a very effective way to lose weight was common (71% of respondents). Stronger belief that exercise is an effective way to lose weight ($p < 0.001$) in individuals with higher weight status ($p = 0.04$) positively predicted discouragement with exercise. Higher weight status combined with the belief that exercise reduces weight was a significant positive predictor of discouragement ($p = 0.01$).

Conclusions.—Individuals with higher weight status that believe that exercise is an effective way to lose weight are more likely to become discouraged when exercise does not lead to weight loss. Prescribing exercise for weight loss might contribute to discouragement. Future studies should evaluate ways to encourage exercise without promoting the belief that exercise will yield weight loss.

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Conflict of interest

DMT was a consultant for Jenny Craig from 2011 to 2013 and has a patent pending for “System and method for predicting fetal and maternal health risks.” TKK reports personal fees from Novo Nordisk, personal fees from 3D Communications, personal fees from EnteroMedics, and personal fees from Eisai, outside the submitted work. FCS is on the Speaker’s Bureau for the American Academy of Nutrition and Dietetics and serves as a content editor for Ebsco/Dynamed.

Keywords

Exercise; Weight loss; Obesity; Weight status; Overweight

Introduction

With the tremendous toll of overweight and obesity in the United States and current estimates which indicate that over one-third of adults (~78 million adults) struggle with obesity, we seek to find strategies which can produce meaningful weight loss (Ogden et al., 2014). The most commonly used strategies to address excess weight are behavior interventions with diet modification and the addition of physical activity. Despite the fact that increased physical activity is often prescribed for weight loss, exercise interventions for weight loss have been found to yield smaller changes in weight than predicted by simplistic energy balance calculations (Thomas et al., 2012). This is because the relationship between energy intake and expenditure is complex, and it includes interactions between energy intake, physical activity, thermic effect of food, and basal energy expenditure (Bray, 2008). Factors such as age, gender, ethnic background, body mass index (BMI), and genetics also play a role in an individual's weight change response to exercise (Luke et al., 2007; Poirier and Despres, 2001; Rankinen et al., 2010). In fact, Thomas and colleagues determined that the discrepancy between expected weight loss and actual weight loss was mostly attributed to modest increases in exercise energy expenditure and compensatory increases in caloric intake (Thomas et al., 2012). Other studies suggest that the lower-than-expected weight loss that is often attributed to incomplete adherence to prescribed exercise interventions may be secondary to baseline calculation errors and metabolic down regulation (Byrne et al., 2012).

While there is strong evidence that exercise does not lead to weight loss, often persons pursue an exercise regimen for aesthetics and/or weight loss. In fact, women who exercise for appearance or weight-related reasons have been observed to be less persistent with exercise and have a poorer body image when compared with their peers (Prichard and Tiggemann, 2008). Jones et al. (2005) found that unrealistic expectations of exercise benefits may lead to disappointment and attrition. Taken together, these studies suggest that expectations involving the role of exercise in weight loss may negatively influence initiation and maintenance of an exercise program. This is of particular concern since sustained exercise forms an essential part of any healthy lifestyle (Haskell et al., 2007). Therefore, it is important to identify individuals who may become discouraged from maintaining exercise as part of their routine lifestyle. This study was designed to determine characteristics of individuals more likely to be discouraged when exercise does not result in weight loss. This knowledge can influence effective treatment interventions and public health strategies to redirect the perception of exercise to improve health rather than achieve weight loss.

Methods

Survey methodology

Google Consumer Surveys (McDonald et al., 2012) were employed to administer three separate questionnaires. The three waves of questions were administered in the survey in

distinct order to eliminate the potential for responses from one set of questions influencing responses to the next set. Google Consumer Surveys infers respondent age and gender based on the website users browsing history and location determined from the Internet provider address. In order to reduce bias in aggregate statistical reporting, Google Consumer Survey also provides post-stratification weighting based on age, gender, and region. The effect yields a more accurate result with lower root mean square error and reflects a better representation of national responses.

Survey questions

The first survey asked participants, “How strongly do you agree or disagree? Exercise is a very effective way to lose weight?” The response choices ranged from (1) strongly disagree to (5) strongly agree. The second survey (Survey 2a, Table 1) asked participants, “Which of the following statements do you believe is more true? Exercise is effective to lose weight. Exercise is effective to prevent weight gain.” Participants had to select one or the other choice. The second survey was re-administered with the survey questions in reverse order to test whether the order of questions influenced the response (Survey 2b, Table 1). Finally, the third survey wave asked a two-tier set of questions. First, participants were asked, “What is your perception of your weight status?” Participants were provided the responses underweight, healthy weight, overweight, very overweight, or obesity, from which they had to select one. The group that responded overweight, very overweight, or obesity was asked follow-up questions (Survey 3 Follow up, Table 1), “How strongly do you agree or disagree? Exercise is a very effective way to lose weight” and “How strongly do you agree or disagree? Because it’s hard to lose weight with exercise, sometimes I get discouraged from exercising” with responses selected from (1) strongly disagree to (5) strongly agree.

Statistical analysis

The basic aggregate reporting of percent responses along with weighting to reduce sampling bias and root square mean error are supplied by Google Consumer Survey (McDonald et al., 2012). Raw data of the responses were also provided as downloads in Microsoft Excel. From the raw data for the respondents in Survey 3 Follow up, an analysis of variance (ANOVA) was performed in JMP® Pro 11.0.0 (2013, Cary, NC) considering input variables of age, gender, income, perceived weight status (WS), belief that exercise is a very effective way to lose weight (BE), and response time. A second ANOVA tested for the significance of interaction terms between WS, BE, age, and gender.

Results

Survey results

In the first wave, there were 1505 total respondents. Of these, 941 had inferred demographic data. The second wave had 753 total respondents with 503 with inferred demographic data. Finally, the third wave had 2410 respondents with 1443 respondents with simultaneous inferred demographic data. Of the 2410 respondents, 1029 answered the follow-up questions, and 337 of these respondents had corresponding inferred demographic data. Survey characteristics are provided in Table 1.

Most respondents (71% weighted for age, gender, and region) agreed that exercise is a very effective way to lose weight (Fig. 1). Younger respondents were significantly more likely ($p < 0.05$) to agree with this. Respondents were evenly divided between believing that exercise is more effective for losing weight or for preventing weight gain. When respondents were asked which of the following statements do they believe to be truer, (1) exercise is effective to prevent weight gain or (2) exercise is effective to lose weight, 32% believed that exercise was effective to prevent weight gain while a much higher percentage of respondents (43.2%) believed that exercise is effective to lose weight. Similarly, when respondents were asked which of the following statements do they believe to be truer, (1) exercise is effective to lose weight or (2) exercise is effective to prevent weight gain, 32.1% believed in the former while 40.7% agreed with the latter. Approximately half of respondents agreed that the difficulty of losing weight with exercise sometimes discouraged them from exercising (Fig. 2).

Predictors of characteristics identified with exercise discouragement

The linear model adjusted R^2 was 0.06. Stronger BE ($p < 0.001$) and higher WS ($p = 0.04$) positively predicted discouragement with exercise. Longer response time was also a significant predictor ($p = 0.05$). Being female had borderline significance for higher discouragement ($p = 0.06$). The second model resulted in an adjusted R^2 of 0.11, and the WS-BE interaction term was a significant positive predictor of discouragement ($p = 0.01$).

Discussion

A widely consistent finding is that exercise leads to little or no weight loss. Despite this, exercise is often prescribed for weight loss. By surveying a nationally representative sample, we sought to determine whether belief that exercise leads to weight loss may discourage individuals from sustaining an exercise program. We also wanted to identify characteristics of individuals who are most at risk for this discouragement. The findings from our survey suggest that many people with obesity believe that exercise is an effective way to lose weight. They further suggest that people with such beliefs are more likely to become discouraged when they discover weight loss from exercise alone is modest. These findings are broadly consistent with earlier findings that linked unrealistic expectations for exercise to disappointment and attrition (Jones et al., 2005).

Our study consists of several strengths and limitations. To administer the survey, we utilized the new survey tool, Google Consumer Surveys (McDonald et al., 2012). Google Consumer Surveys provide a survey tool that has a wide reach and higher response rates than other surveys (McDonald et al., 2012). This is because of the small number of questions in each survey which can be attained since demographics can be inferred. All surveys are not without limitations. Google Consumer Surveys rely on Internet users, and respondents tend more often to be younger and higher educated than national averages. In recognition of this limitation, Google Consumer Surveys weigh results by inferred gender, age, and region to make the sample as representative as possible of the Internet population (McDonald et al., 2012). An interesting result of our analysis was that individuals increased response time when reporting higher weight status. This may be due to hesitation to respond because of the

social stigma associated to high weight status (Wee et al., 2015) or because respondents may have taken more care to accurately classify their weight status (Tourangeau et al., 2000).

The American College of Sports Medicine recommends physical activity for prevention of weight gain, weight loss, and weight loss maintenance. Specifically, the 2009 American College of Sports Medicine recommends 200–300 min per week for long-term weight loss, which is higher than the 150 min per week of moderately intense physical activity for overweight and obese adults (Donnelly et al., 2009). Unfortunately, frequent dropout has been observed in overweight and obese BMI classes exercise interventions prescribing higher doses of activity (Westerterp et al., 1992). Additionally, individuals have been observed to “compensate” to higher doses of exercise through increased energy intake resulting in modest weight loss (Thomas et al., 2012; Church et al., 2009). The reasons for compensation are not well understood but may contribute even further for discouraging long-term sustained exercise.

The public appears to be open to the view that exercise is more useful for preventing weight gain than for causing weight loss. This insight suggests an opportunity for fostering more realistic expectations and better adherence to exercise. Physicians and other health care providers can personalize exercise prescriptions to fit their patients while acknowledging that a patient's response to exercise will vary widely from one individual to the next (Andersen, 1999).

Conclusion

A large majority of survey respondents believed that exercise was a very effective way to lose weight. Persons with higher perceived weight status and belief that exercise was an effective way to lose weight were more likely to become discouraged when exercise did not produce substantial weight loss results. It is important to educate persons on the potential modest response to exercise for weight loss and focus on the important role that exercise plays in weight maintenance and reduction of chronic disease risk factors.

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Results for respondents with demographics. Weighted by Age, Gender, Region. (941 responses)

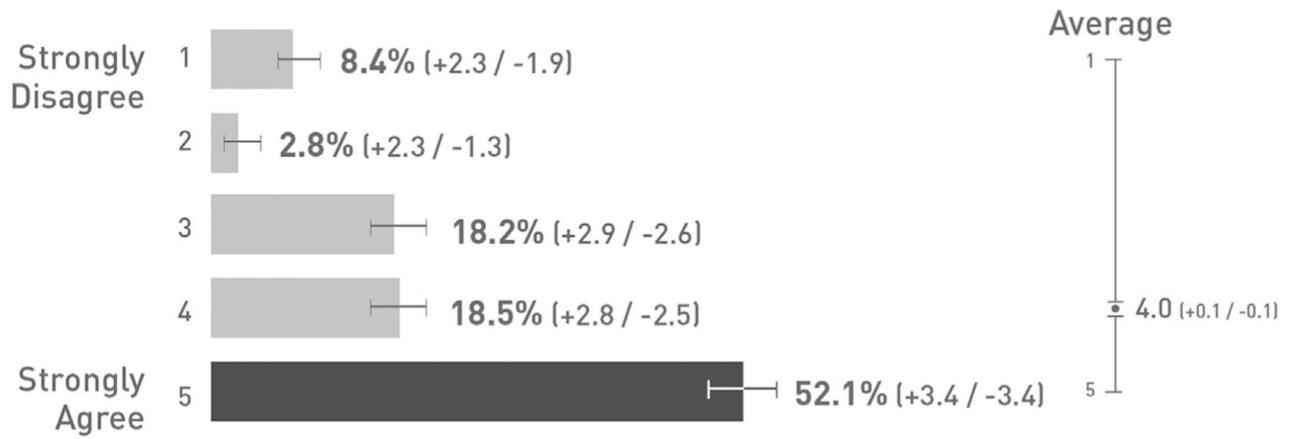


Fig. 1. How strongly do you agree or disagree? Exercise is a very effective way to lose weight. Results for respondents with demographics. Weighted by age, gender, and region (941 responses).

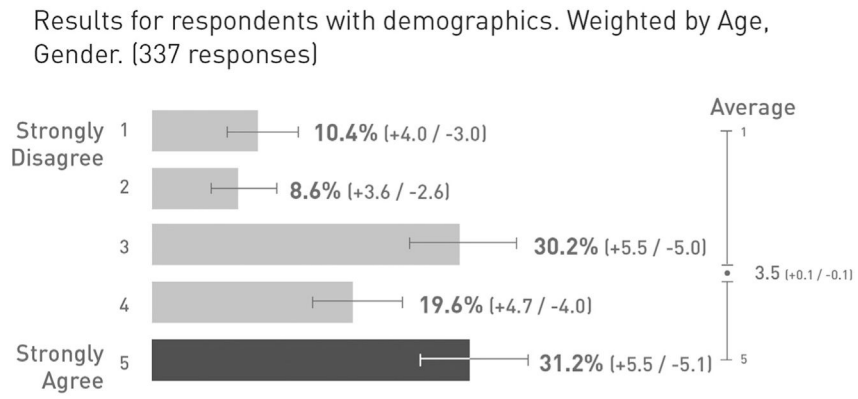


Fig. 2. How strongly do you agree or disagree? Because it's hard to lose weight with exercise, sometimes I get discouraged from exercising. Results for respondents with demographics. Weighted by age and gender (337 responses).

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Table 1

Summary of each survey wave. Survey 2a represents the first survey performed with the second wave questions, and Survey 2b represents the second survey performed with the same questions. Survey 3 Follow up contains follow-up questions asked of respondents classifying their weight status as overweight, very overweight, or obesity.

Survey wave	N*	Age,* % in each range	Gender*
1	941	18–24 years: 6.0 25–34 years: 14.0 35–44 years: 9.2 45–54 years: 19.3 55–64 years: 24.0 over 64 years: 26.6	55.7% male 44.3% female
2a	503	18–24 years: 15.5 25–34 years: 14.7 35–44 years: 14.1 45–54 years: 19.4 55–64 years: 22.4 Over 64 years: 13.9	55.3% male 44.7% female
2b	517	18–24 years: 13.5 25–34 years: 18.0 35–44 years: 13.5 45–54 years: 16.4 55–64 years: 22.6 Over 64 years: 15.9	57.5% male 42.5% female
3	1443	18–24 years: 12.5 25–34 years: 10.0 35–44 years: 14.0 45–54 years: 19.1 55–64 years: 24.3 Over 64 years: 14.2	64.5% male 35.5% female
3 follow-up	337	18–24 years: 11.4 25–34 years: 15.6 35–44 years: 17.7 45–54 years: 20.1 55–64 years: 21.0 Over 64 years: 14.4	60.9% male 39.1% female

* Demographics inferred from Google Consumer Survey methods.