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Impact of Addressing Reasons for Weight Loss on Behavioral Weight-Control Outcome

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Abstract

Background—One way to improve weight control may be to place greater emphasis on the main reasons why individuals want to lose weight.

Purpose—To evaluate the effects of emphasizing physical appearance, health or both on behavioral weight-control outcome.

Design—RCT. Data were collected from 2003 to 2005 and analyzed in 2009.

Setting/Participants—203 women aged 18–55 years ($M = 41.8$, $SD = 9.2$), $BMI > 27$ and < 40 ($M = 34.2$, $SD = 3.7$) who rated both appearance and health as important reasons for weight loss, enrolled at a university medical center.

Intervention—A 6-month weekly behavioral intervention alone (STANDARD) was compared to an enhanced focus on physical appearance (APPEARANCE), health benefits of weight loss (HEALTH), or both appearance and health (COMBINED). The 6-month period of acute intervention was followed by six monthly booster sessions.

Main Outcome Measures—The primary outcome was change in body weight (kg). Additional outcomes included the Multidimensional Body-Self Relations Questionnaire (MBSRQ), Medical Outcomes Study Short Form-36 (MOS-SF36), and questions about satisfaction with weight, appearance, and health. Assessments were conducted at 0, 6, 12 and 18 months.

Results—APPEARANCE demonstrated significantly greater weight loss compared to STANDARD at 6 months ($p = 0.0107$). COMBINED demonstrated greater weight loss compared to STANDARD at 6 and 12 months (p 's = 0.0034 and 0.0270, respectively). Although addressing motivators differentially affected satisfaction at 6 months, satisfaction was unrelated to weight outcome over the following year.

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Conclusions—Behavioral interventions incorporating components with a focus on physical appearance were associated with improved short-term weight loss. The mechanism for this effect is unclear and warrants further study.

Comprehensive lifestyle interventions, which include diet, exercise, and behavior modification techniques, have resulted in weight losses of approximately 10% of initial weight in 4–6 months.¹ Weight losses of this magnitude have been associated with significant short-term improvements in obesity-related health parameters such as insulin sensitivity and glycemic control.² Lifestyle interventions also have been associated with enhanced psychosocial functioning.³ However, short-term weight losses with behavioral intervention generally are followed by longer-term weight regain.

One method of improving weight-control outcome may be to place greater emphasis on the reasons why individuals want to lose weight. Several studies have investigated reasons for weight loss, and most have indicated that concerns about health are the most common motivators, followed by concerns about appearance.⁴ For example, an investigation of dieters documented that “physical appearance” and “health-related concerns” were the two most important reasons for seeking weight-loss treatment among both black and white women.⁵ Similarly, a Canadian study found that among female dieters, 62% wanted to lose weight “to become more attractive” and 68% wanted “to improve general health.”⁶ All other reasons for losing weight were endorsed by less than 6% of this sample. Foster and colleagues⁷ reported that “physical appearance” was rated as most important followed by “medical condition” when women set a goal weight for behavioral treatment. Thus, available research suggests that physical appearance and health are the main reasons women seek weight-loss treatment.

Some researchers have hypothesized that dissatisfaction with short-term weight loss achieved in weight-control programs may be a key factor in the high prevalence of longer-term weight regain,⁸ and there is preliminary evidence suggesting that satisfaction is associated with continued weight loss or maintenance.⁷ Thus, the present study sought to focus on addressing participants’ primary reasons for weight loss (health, physical appearance, or both) during a standard behavioral weight-loss program. The study evaluated the effects of adding additional emphasis on health, physical appearance or both on weight trajectory over 18 months, with the hypothesis that addressing reasons for weight loss in the context of standard behavioral treatment would be superior to standard treatment alone. Additional outcomes included self-report measures of appearance, health and satisfaction. Finally, the relationship of satisfaction to weight change over the following year was explored.

PARTICIPANTS AND METHODS

Study Design

Participants were screened, and eligible women (N = 203) were randomized to one of four groups: (1) Standard behavioral intervention (STANDARD), (2) Standard intervention plus enhancement of physical appearance (APPEARANCE), (3) Standard intervention plus enhancement of health benefits of weight loss (HEALTH), or (4) Standard intervention plus an equal emphasis on appearance and health (COMBINED). There were 24 treatment sessions delivered weekly for 6 months, followed by monthly follow-up sessions for 6 months, and no contact over the final 6 months. Participants completed assessments at baseline, 6, 12, and 18 months after randomization. The study was approved by the University of Pittsburgh IRB, and all patients signed written informed consent. Data were collected from 2003 to 2005 and analyzed in 2009.

Recruitment

Women were recruited from the community via newspaper advertisements and flyers mailed throughout the Pittsburgh area. Eligibility criteria included: (1) aged 18–55 years, (2) BMI ≥ 27 and ≤ 40 , and (3) rating both “improve your physical appearance” and “improve your general health” as important reasons for weight loss (≥ 7) on a brief questionnaire evaluating reasons for weight loss based on a scale of 1 to 10, where 1 is not at all important and 10 is extremely important. Exclusion criteria included: (1) presence of a serious condition that required medical supervision of diet or exercise, (2) physical problems that prevented regular exercise, (3) use of a weight-loss medication, (4) participation in a weight-loss program, currently or within the past 6 months, (5) pregnant or planning on becoming pregnant within 18 months, (6) self-reported substantial binge eating problem, and (7) current treatment for a psychological disorder. Study recruitment and flow is shown in Figure 1. Individual participants were allocated to one of the four study groups with assignment based on a random number. One woman was excluded after randomization because of participation in another behavioral weight-loss program.

Measures

Participants self-reported age, race/ethnicity, marital status, income and education level. Weight was assessed using a calibrated digital scale with subjects wearing light clothing and no shoes at 0, 6, 12 and 18 months. Height was measured using a mounted stadiometer, and BMI was calculated as weight (kg)/height (meters²). The Multidimensional Body-Self Relations Questionnaire⁹ Appearance Evaluation and Appearance Orientation subscales were utilized as measures of appearance, with scores ranging from 2 to 5. High scores on Appearance Evaluation indicate more satisfaction with one’s looks. On Appearance Orientation, high scores reflect placing more importance on looks. The Medical Outcomes Study Short Form-36,¹⁰ Mental Health and Physical Health subscales were used to evaluate limitations in activities due to physical or emotional difficulties. All items on this 36-item self-report questionnaire are rated so that a higher value represents a more favorable health state, with scores ranging from 0 to 100. A brief investigator-designed questionnaire was used to assess participants’ satisfaction with physical appearance, health and body weight, which were rated on a scale of 0 to 10, with 0 representing not at all satisfied and 10 being extremely satisfied.

Standard Behavioral Weight Management Program

All treatment sessions were delivered in a group format. Group meetings provided information regarding diet and exercise as well as training in behavioral skills to modify eating and activity. Sessions were lead by a multidisciplinary team of clinical psychologists, nutritionists, and exercise physiologists. All four study arms were equivalent in intervention time and clinician attention.

All participants were given a calorie goal based on current body weight with participants weighing < 90.9 kg receiving a goal of 1200 kcal/day, and those weighing ≥ 90.9 kg prescribed 1500 kcal/day, and a low-fat eating plan. Participants were asked to increase their participation in moderately vigorous physical activity to reach a minimum goal of 180 minutes per week, and to self-monitor food intake (calories and fat) and physical activity daily by recording these behaviors in a diary. They were also asked to complete simple homework assignments (e.g., reducing fat levels in a favorite recipe, removing a high-fat food from their kitchen). Participants were given the opportunity to earn four monetary incentives (\$30 each) based on session attendance and completion of assessments.

Addressing Reasons for Weight Loss in Standard Behavioral Treatment

The HEALTH groups incorporated an intensified emphasis on health into the standard behavioral intervention. Health-focused activities included measuring waist circumference; body fat assessment; discussing results of blood work and blood pressure measurements; in-session exercise; health expert lectures; and self-ratings of health. The APPEARANCE groups incorporated techniques to address concerns about physical appearance. These included additional activities geared to building body esteem; use of photographs taken “before” and “after” treatment; physical measurements; trying on clothing for fit; use of a computerized body size estimator; image consultant lectures; and self-ratings of physical appearance. To address both of the primary motivators for weight loss, the COMBINED groups received half of the content provided to the HEALTH and APPEARANCE groups. The STANDARD group did not include any additional focus on motivators for weight loss. Study manuals are available on request.

Sample Size and Power

Power analyses were conducted using PASS 6.0 software. Projections were based on a sample size of 45 participants per group. With up to 40% attrition, 27 participants per group, there was sufficient power to detect an effect size of .6 for the STANDARD group versus each of the other three groups (APPEARANCE, HEALTH and COMBINED).

Statistical Analyses

Descriptive statistics were used to summarize characteristics of study participants. Independent one-way ANOVAs and chi-square analyses (or Fisher’s exact tests) were performed for continuous and categorical variables, respectively, to compare those lost to follow-up with those retained in the study on baseline weight and demographics. The proportion of women lost to follow-up by group was compared at each time point using a separate chi-square test. Statistical significance was set at $p \leq .05$, and all tests were two-tailed. All analyses were performed using SAS, version 9.1 (SAS Institute, Cary, NC).

To test the hypothesis that addressing reasons for weight loss would have a positive impact on weight and other outcomes relative to standard behavioral treatment throughout the full study period, longitudinal models were fit using SAS mixed models. Analysis of each outcome included terms for time (0, 6, 12 and 18 months), group (HEALTH, APPEARANCE, COMBINED or STANDARD), and group by time interaction. Time was treated as a categorical variable. Planned contrasts were set to compare each of the conditions addressing reasons for weight loss (HEALTH, APPEARANCE, or COMBINED) to STANDARD in changes from baseline to the 6-, 12- and 18-month assessments for all outcomes. Effect sizes were calculated for change in mean weight using the effect size formula proposed for pretest–posttest–control group.^{11, 12}

To evaluate the effect of addressing reasons for weight loss on weight maintenance after the initial 6-month period of acute intervention, planned contrasts were set to compare conditions addressing reasons for weight loss (HEALTH, APPEARANCE, or COMBINED) to STANDARD in weight changes from 6 to 18 months. In order to evaluate the sensitivity of results for weight change, the MCMC method¹³ was used to run a model with multiple imputations for missing data, incorporating planned contrasts as described above.

A series of models were also run to examine potential covariates of weight change including age, education, employment status, spouse BMI, ethnicity and marital status. Education and age were significantly related to weight change, but all other factors were not. Less education was associated with higher body weight and poorer weight outcome over time ($\beta = -1.36$, $SE = 0.65$, $p = 0.0397$), and younger women also had higher weight and poorer

weight outcome over time ($\beta = -0.19$, $SE = 0.09$, $p=0.0391$). As the overall pattern of results was the same with and without covariates, and education and age did not interact with randomization group, models were reported without covariates in the results section.

Finally, a series of models were run that included satisfaction with appearance, health and weight at the end of acute treatment as predictors of weight change over the next 12 months. Specifically, satisfaction at 6 months was utilized as a predictor of weight change at 6 to 18 months, controlling for group and for weight at 6 months. Change in satisfaction 0 to 6 months was also examined as a predictor of outcome.

RESULTS

Sample Characteristics and Session Attendance

Participant characteristics are shown in Table 1, and study retention is shown in Figure 1. Participants lost to follow-up at 6, 12 and 18 months did not differ in baseline characteristics from those who completed study assessments. Additionally, retention did not differ by group at 6, 12 or 18 months. On average, participants attended 15.4 ($SD = 7.2$) of 24 weekly sessions, and the number of sessions attended did not differ by group.

Weight Outcomes

Mean weight loss over the first 6 months was 9.48 kg ($SD = 7.28$) for APPEARANCE, 7.72 kg ($SD = 6.54$) for HEALTH, 9.60 kg ($SD = 6.25$) for COMBINED and 6.66 kg ($SD = 6.18$) for STANDARD. Modeled changes in outcomes by group at 6, 12 and 18 months for the SAS mixed models are shown in Table 2. Modeled weight trajectories for each group are shown in Figure 2. As specified in the analytic plan, planned contrasts were used to compare each of the groups addressing reasons for weight loss (APPEARANCE, HEALTH and COMBINED) to STANDARD treatment at 6, 12 and 18 months. Results indicated that APPEARANCE and COMBINED demonstrated significantly greater reduction in mean weight when compared to STANDARD at 6 months [$F(1, 375) = 6.59$, $p = 0.0107$, and $F(1, 375) = 8.70$, $p = 0.0034$, respectively]. In addition, COMBINED demonstrated significantly greater reduction in weight when compared to STANDARD at 12 months [$F(1, 375) = 4.93$, $p = 0.0270$], and APPEARANCE demonstrated a trend toward greater loss when compared to STANDARD at 12 months [$F(1, 375) = 3.74$, $p = 0.0538$]. The corresponding effect sizes for APPEARANCE and COMBINED were -0.32 and -0.54 at 6 months, and -0.29 and -0.47 at 12 months, respectively. At 18 months, only APPEARANCE was marginally different from STANDARD in terms of the weight change at 18 months [$F(1, 375) = 3.75$, $p = 0.0791$], and HEALTH and COMBINED did not differ significantly from STANDARD. Results of multiple imputation to account for missing data yielded similar change values, but SEs were higher, and results were no longer significant.

Weight maintenance was also evaluated as weight change from 6 to 18 months. A priori comparisons of weight change in APPEARANCE, HEALTH and COMBINED relative to STANDARD over the 12 months following acute treatment were not significant, suggesting that the groups did not differ significantly in maintenance of weight loss.

Additional Study Outcomes

To evaluate the effect of addressing reasons for weight loss on satisfaction, appearance (MBSRQ appearance subscales), and health (MOS-SF 36) during weekly treatment (0–6 months), planned contrasts were used to compare change scores from 0 to 6 months in APPEARANCE, HEALTH and COMBINED to STANDARD (see Table 2). With respect to satisfaction, the COMBINED group was significantly more satisfied with both weight and appearance at 6 months relative to STANDARD ($p's < .05$). Additionally, both the

APPEARANCE and COMBINED groups were more satisfied with body size and shape at 6 months relative to STANDARD ($p < .05$). None of the a priori comparisons was significant for MOS SF-36 and MBSRQ subscales from baseline to 6 months, indicating that APPEARANCE, HEALTH and COMBINED did not differ from STANDARD.

Finally, satisfaction was examined as a predictor of weight maintenance as described in the analytic plan. Results of modeling indicated that satisfaction (with weight, appearance, body size and shape, and health) at 6 months was not significantly associated with weight trajectory over the following 12 months. Similarly, change in satisfaction from baseline to 6 months was unrelated to weight control over the next 12 months.

DISCUSSION

This study examined approaches designed to improve weight control in a standard behavioral program; one emphasizing health, one appearance, and another both. Analysis of weight trajectories indicated that APPEARANCE and COMBINED treatment led to superior outcomes relative to STANDARD behavioral intervention through 12 months. Thus, it appears that techniques to enhance physical appearance, which were included in both the APPEARANCE and COMBINED interventions, are associated with a more favorable weight loss at 6 and 12 months. Differences between groups were not significant at 18 months.

Benefits at 6 months included not only greater reductions in weight, but also greater satisfaction with appearance, weight, body size and shape. However, it does not appear that satisfaction was related to subsequent weight maintenance. A better understanding of the factors associated with weight reduction in the APPEARANCE and COMBINED groups may help to replicate and extend the effects of the interventions on body weight. It is intriguing to speculate that factors associated with physical appearance may be more salient and novel to women than health benefits of weight loss, which are now well known and frequently addressed in treatment. Moreover, it may be noted that the APPEARANCE group exhibited a marginally greater weight loss at 18 months relative to standard behavioral intervention. Further work utilizing appearance-focused interventions during maintenance may prove useful, and an increased duration of intervention may be needed to improve weight control over time.

Study strengths included a large sample size and prospective, randomized, controlled design. There also were limitations. All study participants were relatively well educated and were women, which might limit generalizability of results. Some data suggest that gender is related to reasons for weight loss. That is, women may be more motivated by appearance-related factors, whereas men may be more concerned with health and fitness.¹⁴ Given that all women rated both health and appearance as important reasons for weight loss, the study design did not attempt to tailor the interventions to the individual reasons for weight loss, or address other possible motivators. Finally, although mixed models analyses included all available data, attrition was relatively high, and the study may have been underpowered relative to the amount of attrition. A sensitivity analysis was conducted using multiple imputation to account for missing data. The magnitudes of the effects were similar, although findings were no longer significant due to increased SEs. This suggests that results may be sensitive to missing data and require replication. Nevertheless, findings suggest that an emphasis on physical appearance may be useful for improving weight loss and maintenance among women participating in behavioral weight-control programs.

In summary, the combination of standard behavioral treatment of obesity with techniques that increase the focus of on physical appearance led to a larger weight loss in acute

treatment, which was sustained over the first 6 months of booster sessions. This approach shows promise and warrants further study, including efforts to understand the mechanisms for the observed effects. Additionally, given that the effects were not sustained through 18 months, interventions with an extended period of contact may be required to improve longer-term weight maintenance. Moreover, weight maintenance interventions for women may benefit from incorporating appearance focused elements. Finally, future work should include diverse samples of men and women, including different ethnic and racial groups.

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REFERENCES

1. Wadden TA, Butryn ML, Byrne KJ. Efficacy of lifestyle modification for long-term weight control. *Obes Res* 2004;12 Suppl:151S–162S. [PubMed: 15687411]
2. Knowler WC, Barrett-Connor E, Fowler SE, Hamman RF, Lachin JM, Walker EA, et al. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med* 2002;346:393–403. [PubMed: 11832527]
3. Wadden TA, Crerand CE, Brock J. Behavioral treatment of obesity. *Psychiatr Clin North Am* 2005;28:151–170. ix. [PubMed: 15733617]
4. Cheskin LJ, Donze LF. Appearance vs. health as motivators for weight loss. *JAMA* 2001;286:2160. [PubMed: 11694161]
5. Striegel-Moore RH, Wilfley DE, Caldwell MB, Needham ML, Brownell KD. Weight-related attitudes and behaviors of women who diet to lose weight: A comparison of black dieters and white dieters. *Obes Res* 1996;4:109–116. [PubMed: 8681043]
6. Green KL, Cameron R, Polivy J, Cooper K, Liu L, Leiter L, et al. Weight dissatisfaction and weight loss attempts among Canadian adults. Canadian Heart Health Surveys Research Group. *CMAJ* 1997;157 Suppl 1:S17–S25. [PubMed: 9220950]
7. Foster GD, Wadden TA, Vogt RA, Brewer G. What is a reasonable weight loss? Patients' expectations and evaluations of obesity treatment outcomes. *J Consult Clin Psychol* 1997;65:79–85. [PubMed: 9103737]
8. Brownell KD, Wadden TA. Etiology and treatment of obesity: Understanding a serious, prevalent, and refractory disorder. *J Consult Clin Psychol* 1992;60:505–517. [PubMed: 1506499]
9. Cash TF. The Multidimensional Body-Self Relations Questionnaire: User's Manual. 2000
10. Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36) I. Conceptual framework and item selection. *Med Care* 1992;30:473–483. [PubMed: 1593914]
11. Becker BJ. Synthesizing standardized mean-change measures. *Br J Math Stat Psychol* 1988;41:257–278.
12. Morris SB. Estimating Effect Sizes From Pretest–Posttest–Control Group Designs. *Organizational Research Methods* 2008;11:364–386.
13. Little, RJA.; Rubin, DB. *Statistical Analysis with Missing Data*. New York: John Wiley & Sons; 2002.
14. Brink PJ, Ferguson K. The decision to lose weight. (Weight research across the lifespan). *West J Nurs Res* 1998;20:89–102.

Figure 1.
Participant recruitment and retention

Figure 2. Participant weight trajectory over 18 months (observed values) SAS mixed models indicated that effect for time was significant [$F(3, 375) = 161.57, p < 0.0001$]

Table 1

Baseline characteristics by group.

Variable	Group			
	APPEARANCE (n = 45)	HEALTH (n = 49)	COMBINED (n = 58)	STANDARD (n = 50)
Age	38.9 (9.9)	41.6 (8.4)	42.8 (8.6)	43.5 (9.5)
Weight (kg)	96.7(13.7)	95.6(12.7)	97.8(11.5)	98.1(13.6)
BMI	34.1(3.9)	33.9 (3.5)	34.3 (3.7)	34.3 (3.5)
Ethnicity				
White (%)	71.1	73.5	72.4	76.0
Black (%)	26.7	24.5	25.9	20.0
Other (%)	2.2	2.0	1.7	4.0
College Graduate (%)	64.5	55.1	46.5	52.0
Married (%)	60.0	45.8	41.8	56.0
Income >\$40,000 (%)	55.8	45.8	56.9	68.4
Satisfaction M (SD)				
with weight	0.78 (1.49)	0.98 (1.52)	0.88 (1.17)	0.58 (1.28)
with appearance	2.73 (2.39)	2.51(1.85)	2.53 (1.85)	2.32 (2.07)
with size/shape	1.71(1.87)	1.80 (1.86)	1.67 (1.63)	1.46 (1.66)
with health	5.38 (2.33)	5.08 (2.49)	5.38 (2.66)	5.90 (2.30)
MBSRQ Subscales M (SD)				
Appear. Orientation	3.59 (0.62)	3.70 (0.70)	3.64 (0.58)	3.66 (0.67)
Appear. Evaluation	2.24 (0.71)	2.23 (0.55)	2.24 (0.60)	2.23 (0.74)
MOS SF-36 Subscales M (SD)				
Physical Health	28.11(2.05)	27.73 (2.72)	27.34 (3.53)	27.36 (2.63)
Mental Health	24.44 (3.30)	24.11(3.71)	24.38 (3.06)	24.10 (3.60)

Table 2

Modeled changes in outcomes from baseline by group over time with Appearance, Health and Combined Compared to Standard.

Outcome	Mo	STANDARD	APPEARANCE	HEALTH	COMBINED
		Mean change(SE)	Mean change(SE)	Mean change(SE)	Mean change(SE)
Weight in kg	6	-6.03(1.71)	-8.71(0.75)*	-7.08(0.69)	-8.92(0.68)**
	12	-5.13(1.05)	-8.16(1.12)	-7.34(0.99)	-8.33(0.99)*
BMI	18	-3.27(1.30)	-6.33(1.37)	-5.86(1.22)	-6.36(1.19)
	6	-2.25(0.27)	-3.31(0.29)**	-2.75(0.26)	-3.46(0.26)**
	12	-1.94(0.40)	-3.13(0.42)*	-2.83(0.38)	-3.27(0.38)*
	18	-1.27(0.49)	-2.48(0.51)	-2.25(0.46)	-2.54(0.45)
Satisfaction					
	6	2.58(0.37)	3.52(0.39)	3.57(0.36)	4.16(0.35)**
with weight	12	2.28(0.49)	3.24(0.51)	4.00(0.46)*	3.52(0.46)
	18	2.12(0.52)	3.06(0.55)	3.18(0.50)	2.98(0.49)
with	6	2.51(0.34)	3.45(0.36)	3.28(0.34)	3.63(0.33)*
appearance	12	2.79(0.47)	2.81(0.49)	3.34(0.44)	3.86(0.44)
	18	2.52(0.51)	2.81(0.54)	3.30(0.48)	3.82(0.47)
with body	6	2.58(0.34)	3.86(0.36)**	3.30(0.33)	3.77(0.32)*
size and	12	2.29(0.46)	3.09(0.48)	3.38(0.43)	3.36(0.43)
shape	18	1.89(0.50)	2.99(0.53)	2.82(0.48)	3.23(0.46)*
with health	6	1.59(0.33)	1.99(0.35)	2.03(0.32)	2.28(0.31)
	12	1.46(0.44)	1.92(0.46)	1.91(0.41)	2.19(0.41)
	18	0.82(0.48)	1.71(0.51)	1.96(0.46)	1.85(0.44)
MBSRQ					
Appearance	6	0.13(0.06)	0.02(0.06)	0.08(0.06)	0.06(0.05)
Orientation	12	0.12(0.09)	-0.09(0.09)	0.13(0.08)	0.09(0.07)
Subscale	18	0.22(0.10)	-0.11(0.10)*	0.03(0.10)	0.04(0.09)
Appearance	6	0.74(0.10)	0.90(0.11)	0.90(0.10)	0.85(0.09)
Evaluation	12	0.99(0.14)	0.71(0.14)	1.04(0.13)	0.93(0.12)

Outcome	Mo	STANDARD Mean change(SE)	APPEARANCE Mean change(SE)	HEALTH Mean change(SE)	COMBINED Mean change(SE)
Subscale	18	0.97(0.16)	0.64(0.16)	0.89(0.15)	0.87(0.14)
SF-36					
Physical	6	0.79(0.41)	0.90(0.44)	1.00(0.41)	0.52(0.40)
Health	12	0.67(0.56)	0.96(0.59)	1.07(0.53)	1.18(0.53)
Subscale	18	0.26(0.62)	0.24(0.66)	0.96(0.59)	1.02(0.57)
Mental	6	0.99(0.51)	0.05(0.54)	-0.16(0.51)	0.56(0.49)
Health	12	0.73(0.69)	0.15(0.72)	0.28(0.66)	0.52(0.65)
Subscale	18	0.69(0.78)	0.67(0.81)	0.42(0.73)	-0.48(0.71)

*
 $p < 0.05$,

**
 $p < 0.01$ when compared to change in STANDARD. Significant results are bolded.