
Weight Loss Self-Efficacy and Modelled Behaviour: Gaining Competence through Example Auto-efficacité pour la perte de poids et modelage du comportement : Acquisition de compétence par le recours à l'exemple

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ABSTRACT

The Weight Efficacy Life-Style Questionnaire (WEL) and the International Physical Activity Questionnaire (IPAQ) assessed self-efficacy and physical activity for 124 volunteers aged 17–61. It was administered before and after participants attended a video modelling workshop. Half of the participants in the treatment and control groups were given copies of the videos to review at home. Predictions were that self-efficacy would increase most for participants who took home the videos after the group-based intervention that was built on models of successful weight loss behaviours. Self-efficacy was also expected to lead to increased physical activity. Results demonstrated that weight loss self-efficacy can be increased by watching successful models. Physical activity, however, did not increase.

RÉSUMÉ

Le questionnaire *Weight Efficacy Life-Style* (WEL) sur le poids efficace et le mode de vie ainsi que le *International Physical Activity Questionnaire* (IPAQ) sur l'activité physique ont permis d'évaluer l'auto-efficacité et l'activité physique chez 124 participants volontaires âgés de 17 à 61 ans, avant et après un atelier de modelage par vidéo. La moitié des participants du groupe expérimental et du groupe témoin ont reçu des copies de vidéo à visionner à domicile. On avait prédit que l'auto-efficacité augmenterait le plus chez les participants ayant reçu une vidéo à visionner à domicile après l'intervention de groupe fondée sur des modèles de comportements menant à une perte de poids réussie. On prévoyait aussi que l'auto-efficacité allait entraîner un accroissement de l'activité physique. Les résultats démontrent que l'auto-efficacité pour la perte de poids peut être accrue grâce au visionnement de modèles de réussite. L'activité physique cependant n'a pas connu d'accroissement.

Obesity is receiving a great deal of attention as a major public health concern (e.g., Crawford, Timperio, Telford, & Salmon, 2006). Estimates suggest that more than half the population of the United States and Canada are considered obese or overweight, and that there is an increasing number of obese individuals within the global population. Theories on the causes of obesity and methods for achieving weight loss, weight loss maintenance, and weight gain prevention have inundated the literature (Le Petit & Berthelot, 2005; World Health Organization, 2000).

Although research efforts in the past have focused singularly on either the physiological or the behavioural factors involved, more recent trends have viewed obesity as the result of a combination of variables (Wadden, Brownell, & Foster, 2002). Many behavioural weight loss treatment programs have yielded only short-term benefits, with a high rate of recidivism (Burke, 2001). Similar shortcomings have been demonstrated with pharmacologic treatments (Wadden et al., 2002). The obesity epidemic appears to involve a complex interaction of biological, behavioural, cognitive, and motivational factors. Evidence highlights the importance of motivational factors such as self-efficacy for predicting weight control behaviours and maintenance of those behaviours (Job Stress Network, n.d.).

RESEARCH ON SELF-EFFICACY STRATEGIES

Bandura and Locke (2003) state:

Among the mechanisms of human agency, none is more central or pervasive than beliefs of personal efficacy. Whatever other factors serve as guides and motivators, they are rooted in the core belief that one has the power to produce desired effects; otherwise one has little incentive to act or to persevere in the face of difficulties. (p. 88)

Self-efficacy is the two-part belief that (a) there is something that can be done to change the situation, and (b) the individuals themselves are capable of this change (Bandura, 1977). Self-efficacy can vary for different life domains. For example, exercise self-efficacy can be defined as “the belief in one’s capability to successfully perform incremental bouts of physical activity” (Sidman, D’Abundo, & Hritz, 2009, p. 163). Similarly, weight control self-efficacy can be defined as the belief in one’s capability to successfully manage one’s weight incrementally. Weight control self-efficacy has been found to play an important role in the battle against obesity, and few constructs have predicted weight loss and maintenance of that weight loss in as consistent a fashion as self-efficacy focused on overeating behaviours (Job Stress Network, n.d.).

Numerous studies have examined the relationship between perceived self-efficacy beliefs and weight management. Research by Kitsantas (2000) compared the weight management self-regulation strategies used by healthy-weight individuals, those who had had weight problems in the past and successfully lost weight, and those who were currently overweight. Self-efficacy measures were also taken for each of the groups. Results indicated that currently overweight participants used significantly fewer self-regulation strategies than the healthy-weight and previously overweight participants. This correlated with significantly lower self-efficacy perceptions than seen with the other two groups. The project, however, did not consider whether participants in the previously overweight group had high perceived self-efficacy initially, which led to their current health state, or whether their self-efficacy increased due to the positive results seen from weight loss.

The current literature reflects relatively few attempts at increasing weight loss self-efficacy beliefs. There has, however, been research investigating methods of increasing exercise-related self-efficacy beliefs through the use of behavioural interventions or other performance related treatments. As exercise, among other factors, is linked to decreased prevalence of obesity (Mihalko & McAuley, 1996), these studies provide valuable starting points for clinicians.

Enhancing Self-Efficacy in Health Behaviours

Mihalko and McAuley (1996) attempted to increase exercise self-efficacy for a group of overweight participants through the use of an acute exercise treatment. Participants had measures of self-efficacy taken before and after a graded exercise test (GXT). Results indicated that exercise-related self-efficacy beliefs increased significantly for participants from pre- to post-tests. More specifically, measures of bicycling and walking self-efficacy were found to have increased during this period after participants had experienced some level of mastery with these behaviours.

McAuley, Talbot, and Martinez (1999) suggest that self-efficacy beliefs can be manipulated not simply by participants' own interpretations of their mastery over a situation but by how they were led to believe they performed through feedback that they received. College women were randomly assigned to high-efficacy (HE) or low-efficacy (LE) feedback conditions and were asked to complete baseline self-efficacy measures followed by a graded exercise test. When the women had completed the exercise test, they were given false feedback about their performance. The HE group was told that their performance far exceeded that of the average participant. In contrast, the LE group was told that their performance was typical of poor cardio-respiratory fitness. After receiving the feedback, both groups completed the efficacy measures for a second time.

At a later visit, the feedback the women received was recounted to them. They then completed the self-efficacy measure for a third time, before being asked to begin a 20-minute session of acute exercise on a Stairmaster exercise machine. Once finished, all participants completed the self-efficacy measure for a final time. The authors found that they could successfully manipulate the efficacy beliefs of these women. While the two groups did not differ in self-efficacy or actual physical performance levels before feedback, the HE group, who were led to believe that they were successful, demonstrated greater efficacy than the LE group, who were led to believe that they had performed poorly.

These beliefs carried over to the second exercise task. The HE group felt that they were more competent in their abilities both before and after the time spent on the Stairmaster in comparison to the LE women. The results from McAuley et al. (1999) suggest that self-efficacy beliefs can be altered not only by one's feelings about one's own sense of accomplishment but also by information or feedback received from other sources.

There have been similar previous attempts at increasing self-efficacy beliefs through the use of modelled exercise behaviour. Ng, Tam, Yew, and Lam (1999) predicted that gains in self-efficacy from learning new exercise behaviours could

be further bolstered by observing professional models. As part of a rehabilitation program the study worked with participants who had been diagnosed with chronic obstructive pulmonary disease. These participants were assigned to either a 1-month behavioural exercise program or to the same program complemented with video modelling techniques. Individuals in the experimental condition were able to view videotapes of professionals modelling the techniques that they were later going to perform. Measures of exercise self-efficacy and exercise performance were taken before and after the 1-month program had been completed.

Ng et al. (1999) found that both groups displayed improvements in exercise performance as well as exercise self-efficacy. Participants in the video modelling condition displayed greater improvements in both areas when compared to the control group. It would seem that having witnessed others execute the task in a way that demonstrated mastery over the situation allowed participants in the experimental condition to feel more competent about their ability to master the task as well. The authors propose that the modelling of successful performance on exercise-related tasks allows those watching to feel more capable in their own attempts at mastering the situation, even when the models are clearly at a higher level than the viewers.

THE PRESENT PROJECT

The current study predicted that participants who watch the successful, positive weight loss behaviours of *similar* others would experience a change in self-efficacy, allowing them to feel more confident in their own ability to successfully lose weight just as the models had done. The study attempted to show that weight loss self-efficacy can be increased for overweight and obese individuals *before* mandated participation in weight loss behaviours. It was hypothesized that participants who watched positive weight loss behaviours being modelled on videotape would show a significant increase in weight loss self-efficacy beliefs over a 2-month period, while a control group, who watched a videotape unrelated to weight loss, would not demonstrate a change.

Participants asked to review a videotape of the modelled exercise behaviours at home during the 2 months were expected to demonstrate higher self-efficacy scores than those watching the same videotape at the initial meeting only. Individuals from the control group asked to review a neutral videotape at home during the 2 months were also not expected to demonstrate a change. Instead, they were expected to report the same levels of self-efficacy as the control-no-homework group. Physical activity levels were also assessed as a possible converging measure of the workshop.

METHOD

Participants

The sample consisted of 124 participants (31 males, 93 females, age range = 17–61) recruited from a medium-size private university in Langley, BC (82% of

sample) and the surrounding community (18% of sample). Body weight classification was determined through Body Mass Index (BMI) calculations from participants' reported height and weight when they first arrived at the lab (BMI = kg/m²; World Health Organization, 2000). The sample included 9 participants whose scores fell in the obese range (BMI > 30), 32 participants who were overweight (BMI > 25), 76 in the healthy weight range (BMI = 18.5–25), and 7 who would be considered underweight (BMI < 18.5). Average physical activity for the participant sample was 5.5 hours per week, while 13 individuals were presently dieting. Ethnic background was reported as 91.2% Caucasian descent, 4.0% Asian descent, 1.6% African descent, 1.6% Hispanic, and 1.6% reporting "other." Recruitment materials asked for volunteers willing to participate in research looking at healthy ways to enjoy eating and exercise. As an added incentive, all participants were entered in a \$50 draw, awarded after the study was completed. Participants from first-year psychology classes were offered 1% bonus credit for their participation in the project as well. Volunteers were recruited through visits to university classes in psychology and human kinetics, an article in a local newspaper, and announcements in a local church. Individual and group meetings were scheduled over the telephone or through e-mail, and participants were assigned in waves to treatment and control conditions.

Measures

WEIGHT EFFICACY LIFE-STYLE QUESTIONNAIRE

The Weight Efficacy Life-Style Questionnaire (WEL; Clark, Abrams, Niaura, Eaton, & Rossi, 1991) assessed participants' confidence in their ability to lose weight. Individuals were asked to respond to statements addressing diet, exercise, and genetic factors. Items were rated on a 10-point scale ranging from 0 (*not confident*) to 9 (*very confident*). The scale is made up of a total of 20 items grouped into five subscales, each of which consists of four items. The five subscales showed good internal consistency: Negative Emotions (.88), Availability (.83), Social Pressure (.89), Physical Discomfort (.84), and Positive Activities (.79; see Clark et al., 1991). The total WEL has been estimated at .92 (Fontaine & Cheskin, 1997). The scale has demonstrated good external validity as its use in two long-term (19 and 26 weeks) weight management programs demonstrated a significant pre- to post-treatment, $p < 0.05$, improvement on overall WEL scores (Clark et al., 1991). It has also shown good convergent validity, demonstrating a significant correlation with the Eating Self-Efficacy Scale (ESES), $r(19) = -.67$, $p < .001$ (the negative correlation is due to the scales being scored in opposite directions).

Because the WEL focuses primarily on a sense of self-efficacy for dieting (Wadden et al., 2002), four new items were developed to obtain participant perceptions of the exercise and genetic factors contributing to weight control. The items were created for use in the present study and were first piloted for readability. The addition of the four new items did little to alter the internal consistency of the total score at the baseline administration (Cronbach's alpha: .93 for the original total

score and .92 for the adapted 24-item total WEL score). Alpha for the new Physical Control subscale was .73, while alpha coefficients for the remaining subscales at the initial administration were as follows: .87 for Negative Emotions, .83 for Availability, .82 for Social Pressure, .74 for Physical Discomfort, .64 for Positive Activities, and an overall alpha of .93 for the total 20-item scale.

INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE

To assess participants' recent levels of physical activity, the short-format, last 7 days, self-administered (S7S) International Physical Activity Questionnaire (IPAQ) was used. The test is a 7-item measure gauging participants' physical activity levels across the previous 7 days from the time the test is taken. Repeatability for the S7S, the version used in the current study, has been reported at Rho, $\rho = 0.75$ ($N = 292$). Tests of concurrent validity between short and long versions of the IPAQ have also shown reasonable agreement ($\rho = 0.67$), while criterion validity measures have demonstrated a correlation of $\rho = 0.30$ against a CSA accelerometer, which kept track electronically of time spent engaged in physical activity and time spent sitting (Craig et al., 2003). Tests of repeatability within the current study, using pre-test and follow-up test scores from control/no-homework participants, across a 2-month period, demonstrated a Spearman's Rho of $\rho = 0.85$ ($N = 22$). The IPAQ has "reasonable measurement properties for monitoring population levels of physical activity among 18- to 65-yr-old adults in diverse settings" (Craig et al., 2003, p. 1381).

Procedure

When arriving for their initial appointment, participants in both the treatment and control groups were asked to fill out a series of questionnaires. First, they were asked for some background information regarding physical characteristics, activity levels, involvement in sports, current and past dieting, illnesses, medications, desire to improve health, and other demographic information. They were next asked to complete the IPAQ to assess their physical activity levels over the past 7 days. After completing the IPAQ they then filled out the WEL, a measure of their current beliefs about their ability to lose weight.

Each group was then shown a 20-minute video segment. When scheduling permitted, participants completed the initial phase of the study as part of a group workshop (54% of the sample). Assignment to treatment versus control conditions was largely dependent on participants' availability for workshop dates, while workshops alternated between treatment and control video viewings. Participants who were unavailable for scheduled workshops were provided with individual coaching sessions (46% of the sample). Group membership was distributed evenly across groups where possible, while individual participants were added to group cells as needed.

Participants in the treatment condition were shown a 20-minute segment from a video entitled *Body-for-LIFE: Success Stories 1* (Phillips & Asiano, 1999). The segment consisted of modelled effective weight-loss behaviours, and accompanied

testimonials, of two overweight individuals (one of each gender). Through proper diet and exercise, the individuals portrayed were able to lose weight and become physically fit over a 12-week period. Participants were given a brief description of the content of the video and were simply told to watch and enjoy.

The control group was shown a 20-minute segment from *The Soothing Surf at the Wickanninnish Inn* (Heinl, 2002). The segment consisted of looping footage of crashing surf from the inn's oceanfront property on Vancouver Island. Participants were instructed to use the 20-minute portion of the video as a relaxation tool. After viewing the video clips, participants in both groups were again asked to complete the WEL.

As participants were being dismissed, every second participant in their respective treatment and control group workshops was given a take-home copy of the video they had just watched. Individual participants were added to group cells as needed. Those given take-home videos were instructed to review them at home every second week over the next 2 months, and were given take-home questionnaires to complete after each viewing to reinforce the content of the videos. Two months after the initial workshop appointment, participants were again contacted and asked to complete the IPAQ and WEL measures one last time (group format: 53%, individual format: 48%), then debriefed and thanked for their participation.

RESULTS

Baseline Statistics

Mean and standard deviation scores were calculated for the WEL Time 1 total data, $M = 5.94$, $SD = 1.40$ (see Table 1). A baseline ANOVA was conducted to explore possible group differences in self-efficacy for participants assigned to watch different video types (Treatment Group), and for participants assigned to different levels of homework (Homework). The results demonstrated that there were no significant effects for baseline WEL total scores (Treatment Group main effect: $F(1, 120) = .139$, $p = .71$; Homework main effect: $F(1, 120) = .338$, $p = .56$; and Treatment Group \times Homework interaction effect: $F(1, 120) = .694$, $p = .41$). This suggests that all conditions were similar in their levels of weight loss self-efficacy prior to the workshop interventions. Descriptive statistics for WEL scores and gender balance for the sample, for subgroups, and across time are presented in Table 2.

Mean and standard deviations were also calculated for the IPAQ Time 1 total multiples of resting metabolic rate (MET) minutes ($M = 3000$, $SD = 3750$; see Table 1). A Mann-Whitney test for non-parametric data was conducted with IPAQ Time 1 total scores, to determine if there were significant differences between the two video Treatment Group conditions, or a significant Treatment Group \times Homework interaction. Results of the Mann-Whitney indicated that there were no significant differences between the video conditions at baseline, $z = -1.52$, $p = .13$, indicating that there were no significant effects for baseline IPAQ total MET minutes.

Table 1
Intercorrelations, Means, and Standard Deviations for WEL and IPAQ Scores for Each Time of Testing

Scores at Times	1	2	3	4	5
1. WEL Time 1	–	.90**	.78**	.06	.07
2. WEL Time 2		–	.78**	.07	.09
3. WEL Time 3			–	.07	.12
4. IPAQ Time 1				–	.79**
5. IPAQ Time 3					–
Mean	5.94	6.26	6.15	3000	2900
Standard Deviation	1.40	1.38	1.35	3750	3710

Note. Weight Efficacy Lifestyle Questionnaire (WEL) total scores ranged from 0 (*not confident*) to 9 (*very confident*). International Physical Activity Questionnaire (IPAQ) total MET minutes indicated the average number of minutes participants spent engaging in physical activity during the past week. Time 1 = before the workshop, Time 2 = after the workshop, Time 3 = two month follow-up.

* $p < .05$, ** $p < .01$.

Table 2
Means, Standard Deviations, Sample Size, and Gender Breakdown for WEL Scores: Treatment Condition by Time of Testing

Treatment Condition	Sex	N	Pre-test			Post-test			Follow-up		
			M	SD	N	M	SD	N	M	SD	N
Treatment Group Total	M	14	5.89	1.44	61	6.26	1.45	60	6.32	1.39	58
	F	47									
Treatment Group Homework	M	3	6.08	1.47	29	6.21	1.53	29	6.48	1.37	28
	F	26									
Treatment Group No Homework	M	11	5.72	1.49	32	6.31	1.27	31	6.18	1.43	30
	F	21									
Control Group Total	M	17	5.99	1.36	63	6.26	1.31	64	5.99	1.30	62
	F	47									
Control Group Homework	M	11	5.96	1.49	30	6.31	1.27	31	5.84	1.43	31
	F	20									
Control Group No Homework	M	6	6.03	1.25	33	6.21	1.37	33	6.14	1.17	31
	F										

Note. Frequencies given for gender and for time of observation do not always match due to missing data in the data set.

* $p < .05$, ** $p < .01$.

Hypotheses

Hypothesis 1 predicted that individuals in the treatment condition would demonstrate a significant increase in weight loss self-efficacy from pre-test to follow-up (pre-test: WEL_{T1}, post-test: WEL_{T2}, follow-up: WEL_{T3}) while control group participants would not demonstrate a significant change. A $2 \times 2 \times 3$

(Treatment Group \times Homework \times Time) mixed-design ANOVA was conducted to identify differences between the groups. Results of the analysis found that there was a significant two-way interaction between Treatment Group and Time (results are presented in Table 3 with Greenhouse-Geisser corrections as appropriate). Participants in the treatment condition showed a continued increase in mean WEL total scores from Time 1 through Time 3 ($M_{T1} = 5.89$, $M_{T2} = 6.26$, $M_{T3} = 6.32$). Control group participants showed an initial increase from Time 1 to Time 2, but returned to baseline scores at Time 3 ($M_{T1} = 5.99$, $M_{T2} = 6.26$, $M_{T3} = 5.99$; see Figure 1).

There was also a significant 3-way Treatment Group \times Homework \times Time interaction as predicted in hypothesis 2 (see Table 3). Looking at mean scores for treatment-homework participants from Time 2, when the homework was assigned, to Time 3 mean WEL total scores, the increase in self-efficacy ($M_{T2} = 6.21$, $M_{T3} = 6.48$) was greatest for these individuals. The control-homework participants, in contrast, showed a drop in self-efficacy from Time 2 to Time 3 ($M_{T2} = 6.31$, $M_{T3} = 5.84$).

Table 3
Analysis of Variance for Weight Loss Self-Efficacy

Source	<i>df</i>	<i>F</i>	η^2	<i>p</i>
		Between subjects		
Group (G)	1	.26	.002	.61
Homework (H)	1	.01	.000	.91
G \times H	1	.10	.001	.76
Error (between)	114			
		Within subjects		
Time (T)	1.73	8.57**	.070	.00
T \times G	1.73	4.78*	.040	.01
T \times H	1.73	0.73	.006	.47
T \times G \times H	1.73	5.13*	.043	.01
Error (within)	197.02			

* $p < .05$, ** $p < .01$.

Hypotheses 1 and 2 were supported by these results. Without considering the separate effects of homework, treatment group participants as a whole reported greater confidence in their ability to lose weight at the 2-month follow-up, while control group participants were in virtually the same place after 2 months as when they first started.

It was further anticipated in hypothesis 2 that providing some treatment group participants with a take-home copy of the motivational video would reinforce their belief in their ability to succeed in the same way the models had. Again, this appeared to be the case. Having the opportunity to review the video at home, the treatment-homework group demonstrated the strongest increase in mean self-

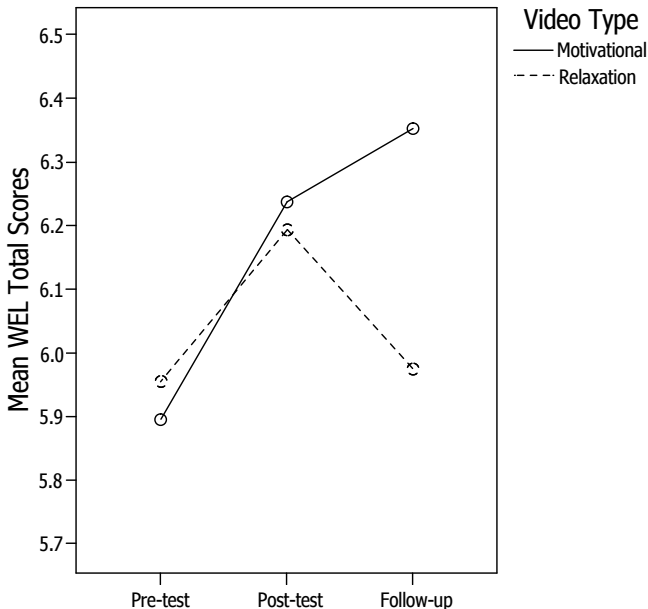
efficacy from Time 1 to Time 3 of any condition. The most significant increase in self-efficacy for this group took place not immediately after the initial video viewing, but across the 2-month interval from post-test to follow-up where there was minimal researcher/participant contact.

While homework participants were encouraged to review the take-home videos at least four times over the course of the 2 months, the average number of actual viewings was much less (Treatment: $M = 1.41$, and Control: $M = 1.90$). Regardless, it appeared that having the video in one's possession may have served as a reminder for treatment-homework participants of the modelled success stories, whether they were reviewing the videos at home or not. Treatment group participants watching the same video at the initial workshop alone tended to show a levelling off in self-efficacy from post-test to follow-up.

In contrast, the control group, given take-home copies of the relaxation video, demonstrated a decrease in self-efficacy from post-test to follow-up, more so than for those watching the same video at the initial workshop alone. The reinforcement of the relaxation videos appeared to contribute to a relative decrease in participants' confidence about their ability to lose weight. This was a curious finding (see Figure 1). Perhaps the take-home relaxation videos reminded participants of more sedentary behaviours such as resting by the seaside.

Figure 1

Interaction Effect of Video Type (Group) by Time of Testing for Participants' Reported Weight Efficacy Lifestyle Questionnaire (WEL) Total Scores, Where WEL Total Scores Ranged from 0 (Not Confident) to 9 (Very Confident)



To explore whether weight class moderated the results, an additional $2 \times 2 \times 3 \times 2$ (Treatment Group \times Homework \times Time \times Weight Class) mixed-design ANOVA was conducted. Weight Class consisted of heavy weight (overweight or obese by BMI conventions) or moderate weight individuals (underweight or normal weight by BMI conventions). A 3-way Treatment Group \times Time \times Weight Class interaction was not found to be significant, $F(1.78, 194.12) = 1.92, p = .16$ (with Greenhouse-Geisser corrections). To determine whether that pattern held true with different Homework levels, a Treatment Group \times Homework \times Time \times Weight interaction was conducted. This 4-way interaction approached significance, $F(1.78, 194.12) = 2.86, p = .07, \eta^2 = .026$ (with Greenhouse-Geisser corrections). Heavy weight participants in the treatment-homework group tended to show the greatest increases in weight loss self-efficacy from baseline to follow-up. The low power of this test makes it worth considering statistical trends to guide future research in the area.

The interaction pattern, while only approaching significance, suggests that Heavy weight participants experienced the effects of the treatment-homework in the same way the Moderate weight participants did, perhaps even more strongly. While both weight classes in the treatment-homework condition showed continued increases in weight loss self-efficacy from baseline to Time 3, the Heavy weight group demonstrated the greatest gains. This observation might help rule out the possibility that Moderate weight participants were masking weaker scores for the Heavy weight individuals.

Hypotheses 3 and 4, which investigated changes in physical activity and the relationship between physical activity and self-efficacy across the 2-month period, respectively, were found to be non-significant. There were neither observed changes in physical activity for any group nor was there a significant relationship between physical activity and self-efficacy for any condition. Therefore, the results will not be discussed in detail.

To summarize, hypotheses 1 and 2 were supported by the results. Individuals viewing the successful modelled weight loss behaviours of similar others demonstrated increased confidence in their own ability to lose weight. This took place without mandating participation in the exercise behaviours being modelled. Moreover, participants who were asked to review the modelled success stories at home over 2 months showed a further increase in self-efficacy. This increase was more evident than for their treatment condition counterparts who watched the same video at the initial workshop session alone. The predicted increases in physical activity and the relationship between physical activity and self-efficacy in hypotheses 3 and 4 were found to be non-significant.

DISCUSSION

As anticipated, weight loss self-efficacy increased for participants who viewed the successful weight loss stories of similar others. This effect was evident in the absence of a prescribed behavioural component. Past research noted above has

clearly shown that self-efficacy can be strengthened by helping clients achieve mastery over exercise or dieting behaviours (Labbe & Welsh, 1993; Mihalko & McAuley, 1996). Also, modelling directly helps people engage in those behaviours (Ng et al., 1999). Counsellors know that successfully coaching clients into action is a key goal for intervention. By showing increases in self-efficacy in the absence of mandated behaviour change, the results of this study can help counsellors focus on those clients who have not yet been successful in changing their actions.

As proposed in the Stages of Change Model for counselling (Prochaska & DiClemente, 1983; cf. Bandura, 2004), readiness for action involves contemplation of potential changes and preparation for specific behavioural changes in a person's life. The impact of the successful models viewed in the video showed important ways that self-efficacy can be strengthened without requiring full behaviour change. Both contemplation and preparation can be enhanced through modelling. As counsellors support clients' identification with others' successes, contemplation can become more powerful. Once clients are ready to prepare concrete plans for change, they can pick up pointers from others who are successful.

Another key aspect of this study is that weight loss self-efficacy increased most powerfully for participants who were given take-home copies of the success-stories videotapes to review at home. In the same way that successful models presented in a workshop format can strengthen contemplation and preparation for action, it seems that homework assignments focusing on contemplation and preparation can also further enhance self-efficacy. This was the case in spite of participants watching the videos less often than recommended.

These results provide additional support for adapting homework assignments to the stage of change that works for each client. Unlike the Ng et al. (1999) study, the models portrayed in this video were not experts. They were average individuals who began overweight and, through their own efforts at dieting and exercise, were able to achieve excellent fitness. This widens the opportunities to find appropriate models in the lives of clients: friends, neighbours, and family members may be as helpful as famous athletes or stars.

Bandura (2004) highlights the importance of social support and guidance during the early periods of personal change. This support is seen to be beneficial primarily if it increases individuals' beliefs in their efficacy to manage their life circumstances. The participants in the present study who viewed the take-home videos (55% of treatment-homework participants reported watching the video at least once) saw the models as a sort of virtual support. The models reminded them of exercise successes and bolstered participants' beliefs in their own ability to successfully manage weight. The workshop and homework combined principles for Stages of Change and modelling. This is a useful framework for planning interventions in the promotion of exercise and weight control. As shown in these results, simply watching the successful weight loss strategies of similar others (and having a reminder of them for those given homework) helped participants feel more confident about their own ability to succeed.

Limitations

There were some limitations that should be noted, however, particularly around the absence of observed behaviour change. The predicted increases in physical activity were not seen from pre-test to follow-up as anticipated. This was somewhat surprising. A possible explanation is that many of the participants were in the action or maintenance stages to start. Average physical activity for the sample was 5.5 hours per week and the bulk of participants (61%) fell into the healthy weight range. It might be assumed that ceiling effects minimized observable changes in physical activity. It is not clear, however, that participants in this study were exercising even at recommended physical activity levels. Statistics from the Public Health Agency of Canada (2010) suggest that Canadians should be involved in at least 60 minutes per day of light physical activity, substantially more than the average levels reported in the present research. It is therefore unlikely that participants in this study were already exercising at or close to their optimal levels.

Another possible explanation is that increases in self-efficacy may have shifted many participants from a pre-contemplative stage to a contemplative or preparation stage. In other words, the shift may have been to increased willingness (reflected in higher self-efficacy scores) but not yet reflecting a shift to action (and thus not showing up consistently in the activity scores). Changes in self-efficacy continued to be seen up to the point of follow-up for treatment-homework participants. Taking additional measures of physical activity later than the 2-month follow-up period could be helpful to capture behaviour changes that were not yet evident at 2 months. This possibility, if supported, would show that the change was continuing for several months after the workshop.

CONCLUSION

Both research and clinical practice support the benefits of increased self-efficacy for weight loss. Available research, however, tends to neglect ways to reach individuals who will not get involved in behavioural weight loss programs for fear of failure or other reasons. This neglect is unfortunate, because pre-treatment self-efficacy has been significantly related to weight loss (e.g., Craig et al., 2003). Similarly, in many professional practice environments, pressure toward short-term therapy models can sometimes obscure the importance of readiness for action in weight loss programs. Focusing on post-treatment self-efficacy after behavioural interventions is dealing with only one half of the problem.

The present research demonstrates that weight loss self-efficacy *can* be increased for participants prior to successful participation in mandated behavioural programs. In fact, the take-home component of the project demonstrated that having access to a reminder of the success stories, to review over 2 months, increased self-efficacy more powerfully than for those who watched the video just once. The enhancement of self-efficacy from homework, and strengthening from social support, makes a powerful case backing prevention strategies for weight

maintenance. Again, improvements in self-efficacy were evident in a sample that included a substantial portion of normal weight individuals.

This pattern of results supports the viability of early stage self-efficacy enhancement for mixed-weight groups; a common situation faced by many health promotion and health education programs. Thus, programming strategies may be able to effectively combine primary prevention education with secondary and tertiary prevention interventions. Building on their increased sense of confidence, these individuals might then connect to supports in the community and from there establish further successes, increasing the likelihood of adopting behaviour change that lasts.

The present research demonstrates that overweight and obese individuals can gain confidence in their ability to successfully lose weight through simple, cost-effective means. The addition of a take-home DVD was enough to further bolster this confidence, perhaps providing a sense of community connection or support. The results suggest that helping a mixed-weight group of people move from contemplation to action is a viable program objective. Combining the full range of prevention plans with effective treatment interventions is a crucial strategy for large-scale public health programs. The brief workshop format with take-home resources promises just this kind of broad-spectrum, efficient intervention.

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