Further Support for Consistent Self-Monitoring as a Vital Component of Successful Weight Control

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Abstract


Objective: This study attempted to replicate that of Baker and Kirschenbaum by providing a descriptive analysis of the relationship between self-monitoring and weight control.

Procedures: Fifty-nine women and men in long-term cognitive-behavioral treatment for obesity participated over an 8-week period. Percentages of participants who self-monitored consistently and the relationship between the variability in self-monitoring and weight change were examined.

Results: As in the previous study, a substantial minority of the participants in this research (26.3%) self-monitored all foods eaten on less than half of the days evaluated. The assertion of Baker and Kirschenbaum that self-monitoring is most appropriately viewed as both a state and a trait was supported by finding that the most consistent self-monitors lost more weight than the least consistent self-monitors; however, regardless of overall self-monitoring consistency, participants lost much more weight during their two most consistent weeks compared with their two least consistent weeks. Again, as in the previous study, only the more consistent quartile of self-monitors lost a substantial amount during the course of this study.

Discussion: The results of both studies taken together suggest that a reasonable target for consistency for self-monitoring within the context of a professional cognitive-behavioral treatment program may be self-monitoring all foods eaten on at least 75% of the days. If participants generally self-monitor on less than half of the days during participation in such programs, they may be very unlikely to succeed at weight loss both during the program and afterward.

Key words: self-monitoring, successful weight control, cognitive-behavioral treatment

Introduction

According to self-regulatory theories (2-7), self-monitoring (the systematic observation in recording of target behaviors) should lead to sustained efforts to match behaviors to goals if attributions, evaluations, and expectations support such efforts. Self-monitoring has been described as the "cornerstone" (8) and the most effective component of the treatment of this notoriously refractory problem (7,9,10).

In accord with these theoretical and clinical perspectives, consistency of self-monitoring often correlates substantially with weight loss (11-16). Sperduto et al. (17) even demonstrated a causal link between self-monitoring and effective weight control. Similar causal effects of self-monitoring have emerged in studies of exercise adherence (18,19), sport performance (20-22), and other domains (23,24).

Despite compelling empirical evidence and persuasive theoretical and clinical analyses, self-monitoring remains a secondary focus in the treatment of obesity (1). Treatment protocols almost always include self-monitoring, but consistency of self-monitoring remains rarely assessed; methods of improving consistency of self-monitoring for weight controllers have been tested in only one study (Boutelle et al., unpubl.). The extant view of self-monitoring is that it is a process that may mediate weight change, but it is not regarded as an important focus for clinical intervention. Baker and Kirschenbaum (1) investigated two issues that accentuate the critical role of self-monitoring. This study...
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attempted to reinforce the points made by Baker and Kirschenbaum by replicating and extending that work.

Baker and Kirschenbaum argued that it would be extremely helpful to know what percentages of people in weight control treatment programs actually monitor consistently. Their research and other studies (16,25; Boutelle et al., unpubl.) suggest not just some self-monitoring but that highly consistent self-monitoring may be critical for effective weight loss and maintenance of weight control (26). Certainly not all people in weight control treatments, particularly treatments that last for many months or even for years, self-monitor very consistently simply because they are encouraged to do so. Without a clear understanding of normative levels, monitoring behavior, therapist expectations, and client expectations regarding consistency of self-monitoring are likely to be misaligned (27). This may result in low efficacy and outcome expectancies, strained therapist–client relationships, and less effective treatment (28,29).

In addition, further analysis of self-monitoring behavior at a descriptive level should encourage therapists to place greater emphasis on this critical aspect of treatment, to develop new and more effective methods of improving consistency of self-monitoring, and to become better able to predict who will succeed in such programs. For example, Schlundt (30) found that 15% of participants in an 8-week to 12-week program did not self-monitor at all. Baker and Kirschenbaum (1) found that similar percentages of their subjects self-monitored only 2 days per week or less. These very poor self-monitors may be extremely unlikely to succeed at losing weight and maintaining weight losses. Consistency of self-monitoring in the very first week of treatment was highly predictive of weight loss 12 weeks later (1), and consistency of self-monitoring during the first 18 weeks of treatment correlated positively with weight loss at a 1-year follow-up (16). Our clients could use this information at the outset of treatment. In fact, they deserve to know the degree to which clients struggle or succeed at maintaining highly consistent self-monitoring and the implications of those data.

The second point that Baker and Kirschenbaum (1) emphasized is that it would be helpful to consider self-monitoring from both a state and a trait perspective:

A state perspective suggests that some people usually monitor very consistently, whereas others typically monitor inconsistently. A state perspective emphasizes the variability within individuals' monitoring behaviors. That is, under some conditions (or states) most people may monitor consistently, whereas their monitoring may become more inconsistent when they are, for example, sick or emotionally distraught (p.380).
The data of Baker and Kirschenbaum (1) showed that even generally highly consistent self-monitors were more effective at losing weight during their most consistent weeks compared with their least consistent weeks. A parallel effect occurred for the generally inconsistent self-monitors. These participants lost weight in their best monitoring weeks but gained weight in their worst monitoring weeks. These data support both trait and state perspectives of self-monitoring. This study attempted to replicate these findings by comparing self-monitors who were generally consistent vs. those who were generally inconsistent during their most consistent vs. their least consistent weeks. If this trait and state perspective of self-monitoring is supported again, it would suggest that researchers and clinicians work toward making weight controllers the best self-monitors that they can be within the constraints of their own dispositions and situations (1). It also may suggest that a certain level of general consistency of self-monitoring is necessary to sustain long-term weight control. This would establish an empirical threshold that may define “obsessive-compulsive self-regulation” as a potentially critical style for maintenance of effective self-regulation (26,31).

In sum, this study was a replication and extension of the effort of Baker and Kirschenbaum (1) to provide a more complete description of the relationship between consistency of self-monitoring and weight control. Participants in two long-term weight control programs were studied during an 8-week period. Consistency of self-monitoring was described and analyzed. Wide variability in consistency of self-monitoring was expected, as was a strong relationship between consistency of self-monitoring and weight loss. In addition, participants’ weight changes during their most consistent 2 weeks were compared with their weight changes during their least consistent weeks. Much better weight loss was expected during the weeks in which participants self-monitored relatively consistently—regardless of their overall levels of consistency of self-monitoring.

Method

Participants

Fifty-nine individuals (42 women, 17 men) from two long-term cognitive-behavioral weight control programs volunteered to serve as participants. These individuals were offered the opportunity to participate in the research as a part of the treatment at both sites. These participants were involved in the treatment programs for an average of 17.07 (range: 1 to 120) months. Participants’ mean weight at the beginning of this study was 223.16 lbs (SD = 55.61) with an average body mass index of 35.54 (SD = 7.28). Participants had lost an average of 33.17 lbs (SD = 27.27, range = -0.6 lbs to -122.0 lbs) when the study began. Fifty-three of the participants were white (93.0%), three were African-American (5.3%), and one was Hispanic (1.8%). Participants’ mean age was 44.51 (SD = 9.98). Thirty-five percent of the sample were single, 53% were married, and 12% were separated, divorced, or widowed. The sample was well
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educated (9% completed high school; 14% had attended some college; 35% had a college degree; 39% had a graduate degree; and 4% did not complete high school).

Procedures
Participants self-monitored for a total of 8 weeks. They were provided with 4"x6" self-monitoring booklets that included columns for describing food intake, fat, calories, and exercise. Both treatment programs already incorporated the use of similar self-monitoring booklets and used the same treatment manual (32); both programs strongly encouraged recording food intake, fat gram intake, calorie intake, and exercise. Self-monitoring was encouraged strongly as part of treatment in both programs. All participants continued in weekly cognitive-behavioral treatment throughout the study. The treatment programs included behavioral contracting, planning, problem solving, and coping skills/stress management treating (7,32–34).

Measures

Self-Monitoring. The self-monitoring booklets were rated as to whether the participant monitored "any" food and "every" food on a given day. "Any" food was defined as whether the participant recorded at least one food on a given day. "Every" food was defined as three clearly separate entries of foods during the day. Ten percent of the monitoring booklets were rated by two raters and reliability was 97% (35).

A second evaluation of monitoring quality was obtained using therapists' ratings of how many times a participant self-monitored all foods during a given week. Therapists rated self-monitoring on a scale of 0 to 7, with 0 meaning "0 days monitored" and 7 meaning "7 days monitored." For participants who monitored something each week, therapists' self-monitoring ratings were highly correlated with the independent raters' evaluations of self-monitoring of "any" foods and "every" foods (p<0.0001).

The objective ratings of "any" and "every" foods eaten may not provide a clear assessment of the consistency of self-monitoring. For example, some participants did not turn in all of their self-monitoring booklets. In addition, for raters to identify "every" food ratings, participants had to record three distinct food entries. This did not occur every day for some people. For example, some participants ate only two meals per day. In contrast, when therapists inquired about the completeness of self-monitoring, they were able to have participants show them whether or not they self-monitored completely. Therefore, we used therapist ratings to determine consistency of self-monitoring because those ratings seemed more veridical than judgments made by the raters. As a check for potential experimenter bias, we analyzed the data for objective ratings of "every" food eaten. The findings paralleled those of the analyses for therapist ratings.

Weight. Participants' weights were recorded at each weekly meeting. If a participant missed a session, the mean difference between known weights was used.

Results

Weight Change
By week 8, participants (n = 57) had lost an average of 0.11 lbs (SD = 6.90) in addition to the mean of 33.17 lbs (SD = 27.27) they had lost before beginning the study.

Self-Monitoring
Diversity in monitoring behavior was clearly demonstrated in the percentage of participants who actually monitored. Specifically, as shown in Figure 1, at 8 weeks, 45.6% of the participants monitored all foods eaten on between 75% and 100% of the days; 28.1% monitored all foods eaten between 50% and 74% of the days; 15.8% monitored all foods eaten between 25% and 49% of the days; and 10.5% monitored foods eaten on 24% or fewer days.

Relationship Between Self-Monitoring and Weight Change
Average consistency of self-monitoring (as represented by therapist ratings) over the 8 weeks of the study and average weight change over the 8 weeks of the study were calculated. Pearson product moment correlations revealed that mean self-monitoring consistency correlated significantly with mean weight change (r = -0.35, p = 0.007).

Participants were also divided into two groups by use of a median-split procedure based on their overall average level of consistency of self-monitoring over 8 weeks, creating a between-subjects factor (overall level of consistency of monitoring: high vs. low). A within-subjects factor (best vs. worst weeks monitoring) was also created. This factor was created by determining each participant's best (most...
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- consistent) 2 weeks of monitoring (according to therapist ratings) vs. their worst 2 weeks. Average weekly weight change served as the dependent variable in an analysis of variance. Participants lost significantly more weight during their 'best' weeks than during their 'worst' weeks ($F[1,55]=7.25, p=0.009$). Also, more consistent self-monitors lost somewhat more weight during the 8 weeks (mean weight change = $-1.49$ lbs) than did less consistent self-monitors (mean weight change = $+1.07$ lbs) ($F[1,55]=2.66, p=0.108$). The interaction effect between participants' overall level of monitoring and their best vs. worst weeks of monitoring was not significant ($F[1,55]=0.04, p=0.934$) (Figure 2).

To examine further the main effects of self-monitoring, more detailed descriptive analyses were computed. All participants were divided into quartiles on the basis of the distribution of the population's actual monitoring. Greater percentages of participants lost weight in the quartiles that reflected greater levels of consistency. Specifically, 40%, 50%, 50%, and 71.4% lost weight at the respective 1st, 2nd, 3rd, and 4th quartiles at 8 weeks. Figure 3 indicates the corresponding mean weight changes of the four quartiles. A one-way ANOVA demonstrated that participants in the more consistent quartiles lost more weight during the 8 weeks than did the inconsistent self-monitors (mean quartile 1 = $+3.21$ lbs; mean quartile 2 = $-0.61$ lbs, mean quartile 3 = $+0.42$ lbs, and mean quartile 4 = $-3.70$ lbs) ($F[3,53]=2.69, p=0.055$). Newman-Keuls multiple comparisons revealed that participants in the least consistent quartile gained more weight than did participants in the most consistent quartile.

**Discussion**

The results from this study closely replicated the results from Baker and Kirschenbaum (1). As in the previous study, participants who monitored consistently lost more weight than did participants who monitored inconsistently. For example, Baker and Kirschenbaum (1) found that 41% of their participants who monitored in the least consistent quartile did not lose any weight at all during a period of 12 weeks vs. 100% of the most consistent monitors who lost weight. In this research, 40% of the least consistent quartile of self-monitors lost weight vs. 71.4% of participants in the most consistent quartile.

Diversity of self-monitoring behavior was again apparent. In the previous study, 18% of the participants self-monitored on fewer than 25% of the days vs. 39% who monitored all foods eaten on 75% to 100% of the days. In this research, 10.5% of the participants monitored all foods eaten on fewer than 25% of the days vs. 45.6% who monitored on 75% or more of the days. The greater length (12 weeks) of the previous study vs. that of this study (8 weeks) may account for the somewhat enhanced consistency of self-monitoring observed in the research presented here. However, the fact that this research was conducted during the winter holidays may have adversely affected overall weight loss (mean weight loss = $-0.11$ lbs vs. $-4.03$ lbs in the 1993 study; 36).

This study also supports the assertion of Baker and Kirschenbaum (1) that self-monitoring is best viewed as both a state and a trait. The most consistent self-monitors lost more weight overall than did the least consistent self-monitors; however, within each self-monitoring quartile, participants lost much more weight during their two most consistent weeks compared with their two least consistent weeks. Once again, as in the study by Baker and Kirschenbaum (1), only the most consistent self-monitors lost a substantial amount of weight during the 8 weeks of this study (mean = $-3.7$ lbs), whereas the least consistent self-monitors gained a substantial amount of weight.

**Figure 2:** Mean weekly weight change for groups of high and low monitors, comparing their best 2 weeks of self-monitoring with their worst 2 weeks of self-monitoring.

**Figure 3:** Mean weight change during the 8 weeks of the study for four quartiles representing four levels of consistency of self-monitoring.
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(mean = +3.21 lbs). This discrepancy in weight change occurred despite the fact that all participants maintained their involvement in a weekly cognitive-behavioral weight control treatment program.

These results clearly suggest that an appropriate goal for the consistency of self-monitoring within the context of a professional treatment program is highly consistent self-monitoring. A reasonable target for consistency of self-monitoring may be self-monitoring all foods eaten on at least 75% of the days or better. Certainly, monitoring all foods eaten on less than half of the days during participation in a cognitive-behavioral weight loss program provides a poor prognosis for success both during the program and afterward (16).

This suggestion of a stringent criteria for effective self-monitoring is consonant with Kirschenbaum’s emphasis (26,31) on the critical nature of “obsessive-compulsive self-regulation” for mastery of refractory behavior changes. Apparently, successful weight controllers must learn to observe their eating and exercising behaviors systematically and very consistently, despite competing distractions both from within (biology) and from external sources. One of therapy’s primary purposes, therefore, is to help maintain this level of focusing and attention to targeted behaviors.

The most consistent findings in the weight control literature is that length of treatment is positively associated with effective weight control (9,11). Consistent (usually weekly) attention from a helping professional seems critical to maintain this necessary degree of awareness of targeted problems and to focus attention on effective coping techniques. The relapse prevention literature also supports this analysis by showing the value of making almost any coping response in the face of temptations vs. omitting all coping responses (36,37). Self-monitoring may serve as both a type of coping response as well as a reinforcer for other coping responses.

The findings presented here suggest the importance of self-monitoring in effective weight control, but they do not establish self-monitoring as a causal agent in weight loss. Perhaps those who monitored at higher levels were better at weight loss because of other factors not measured in this study, such as commitment to losing weight, better coping skills, or some other dispositional characteristics (1). Perhaps individuals who sustain self-monitoring efforts more consistently have better frustration tolerance, are able to make adaptive attributions regarding their self-monitoring, or are less likely to disrupt their self-regulatory efforts because of other cognitive or affective factors (5,38). Another distinct possibility is that whenever weight controllers find themselves successfully eating and exercising in accord with their plans, regardless of how they developed these successful patterns, they may find it easier (more pleasant) to self-monitor. In addition, it is possible that consistency of self-monitoring may be more of an indicator of general motivation when weight controllers are further along in treatment, but may play a different role for weight controllers who are just beginning treatment. This could be evaluated in future studies.

Some or most of these hypotheses are undoubtedly accurate. However, previous research that included experimental designs focused on self-monitoring in weight control (17; Boutelle et al., unpubl.) and related experiments in domains other than weight control (18,22) have established consistency of self-monitoring as a causal agent in self-regulation. Reciprocal relationships certainly exist between weight control, affect, self-monitoring, and other behaviors (36). Additional research will be necessary to establish the conditions under which, and the mechanisms by which, self-monitoring has the maximum effect on effective weight control. Yet, it has become abundantly clear that efforts to help clients become the best self-monitors that they can be (36) may prove critical to helping them lose weight and maintain weight losses.

There may also be a threshold of consistency of self-monitoring below which any efforts at long-term weight control will prove futile. Our clinical experience and previous research by our group and others (1,17,16,36; Boutelle et al., unpubl.) and related theoretical perspectives (4,26) indicate that monitoring less than half of the time (perhaps monitoring less than 75% of the time) may make sustained success very unlikely. Additional research on methods to maximize consistency of self-monitoring (Boutelle et al., unpubl.) and on the extent to which upper and lower consistencies of self-monitoring thresholds affect long-term outcomes would have immediate practical implications.

References

8. Wadden TA. The treatment of obesity: an overview. In:
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36. Drapkin RG, Wing RR, Shiffman S. Responses to hypothetical high risk situations: Do they predict weight loss in a behavioral treatment program or the context of dietary lapses? Health Psychol. 1995;14:427-34.