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# A short-term cognitive group treatment program gives substantial weight reduction up to 18 months from the end of treatment. A randomized controlled trial

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**ABSTRACT. Objective:** To describe and evaluate long-term efficacy (18 months from the end of treatment) of a new cognitive short-term weight reducing treatment program for obese patients. **Subjects:** One hundred and five obese [Body Mass Index (BMI)  $\geq 30$ ] patients participated in the study. Of these, 62 took part in the treatment program and 43 served as controls. **Method:** From an obesity unit's waiting list, the patients were randomly assigned to either a treatment group or remained in the waiting list to serve as a control group. The treatment group participated in a 10-week (30 hours) cognitive group treatment program. All participants were weighed at the outset of the study, directly after treatment and at a 6-, 12- and 18-month post-treatment follow-up without any booster treatment after the 10-week program. **Results:** Fifty-seven (92%) patients completed treatment. For the 34 (60%) patients who participated in the study 18 months after treatment was terminated, the mean weight loss at treatment's end was 8.5 kg (SD=16.1). Eighteen months later their mean weight loss was 10.4 kg (SD=10.8). The control patients (n=31, 72%) that participated in the study during the same period increased in weight by 2.3 kg (SD=7.0). The weight difference between the treatment and control group at the 18-month follow-up was highly significant ( $p < 0.001$ ). **Conclusion:** The cognitive group treatment program was highly acceptable among the participants and was completed by nearly all the patients. The 10-week treatment program resulted in satisfactory weight loss. The weight difference between the treatment group and controls was nearly the same at 18 months after end of treatment as at six months. The study, therefore, does not provide support for the contention that a lengthy therapy for obesity is necessary if treatment results are lasting.

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## INTRODUCTION

During the past few decades, a number of treatment approaches have evolved in an effort to attain weight reduction in persons who are overweight. The most common treatment methods, those having to do with dieting and training routines, have proven to be inadequate, and thus in order to enhance the treatment effects, behavior therapy methods are being used to a greater extent. The treatment programs are often of a long duration, extending anywhere from one to several years. It is true that the patients in these extended treatment programs do experience weight reduction while they are still in the program, but within one year after treatment has concluded, most of these patients regain up to 60-70% of the weight they lost during

the program (1-3). In the search for new models for the treatment of obesity, cognitive behavior therapy (CBT) is increasingly being used to treat persons who are overweight or obese. However, here also we find that the follow-up results are poor (4). Follow-up studies during 3-5 years of behavior treatment of obesity show a general return to baseline weight (5, 6).

Apart from surgical treatment, treatment methods that include support and contact even after treatment are the only approaches that have demonstrated long-term maintenance of weight loss (7-9). Obesity has therefore been classified as a chronic illness in need of long-term and continuing treatment (1, 10, 11). In patients seeking clinical treatment for obesity, from 25 to 30% are thought to have binge eating disorder (BED) (12). The disorder

### Key words:

Cognitive treatment, efficacy, binge eating disorder, obesity, randomized controlled trial, psycho-education, stress, helplessness.

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is associated with increased occurrence of depression and personality disturbances (13-16).

The unsatisfactory treatment results for obesity may be a consequence of the fact that treatment has primarily focused on eating behavior and seldom on the psychosocial causes of such behavior. Foreyt et al. (17) envision stress as one of the most common causes of overeating and therefore these authors see a need for patients to learn about stress management and relaxation. Studies investigating "successful mechanisms" in weight loss and its sustainment have stressed self-control, physical activity, self-monitoring, social support and positive coping strategies as important weight loss mechanisms (18-20).

To reach large groups of persons that are overweight or obese, cognitive programs have been sought that can be used by professional groups other than those traditional ones within psychiatry (21). There is good reason to believe that dietitians and registered nurses with special training and support could successfully use CBT in persons suffering from overweight (21). For instance, CBT could be used within a program that also includes psychological goals such as mood changes, self-esteem and a better understanding of stress (1).

With this background, a cognitive treatment program was developed with the ambition to give obese patients information and the tools needed to change their dysfunctional behaviors in everyday situations, the negative self-image, the deficient self-control and experiences of stress. Such changes are considered necessary in order to be able to change dysfunctional eating behavior and bring about weight loss.

A primary objective of the present paper is to describe this treatment program for obese patients and evaluate the long-term efficacy (18 month from the end of treatment) in a randomized controlled trial. A second objective is to examine the impact of binge eating disorder (BED) on the treatment result.

## METHODS

### *Subjects*

One hundred and thirty-two obese female patients (BMI  $\geq 30$  kg/m<sup>2</sup>) from the waiting list for non-surgical treatment at the Obesity Unit at Huddinge University Hospital were asked to participate in the study. Sixty-six of those were randomized to the cognitive treatment program and the other 66 remained in the waiting list for treatment as usual. The latter group served as controls. At the start of the study, the waiting time for treatment at the Obesity Unit was about two years.

After randomization, all patients were asked to respond to a written query about their participation in the study. One hundred and eleven of the patients accepted to participate in the trial; 65 in the cognitive treatment group and 46 in the control group. Of these, two fulfilled one of the exclusion criteria: signs of active tumor disease, pregnancy and symptoms of psychosis. One patient that completed the treatment and three of the control patients withdrew their consent to participate further. These four persons are for ethical reasons not included in the data analysis in this paper. Accordingly this is a report on 62 patients who began treatment (mean BMI=40.4) and 43 controls (mean BMI= 39.2).

All patients except two (one in the treatment program and one in the control group) had previously participated in numerous group or individual weight loss programs. The majority of the patients characterized themselves as "perpetual dieters."

The participants received both oral and written information about the study. The study was approved by the Ethics Committee of Karolinska Institutet (Huddinge University Hospital).

### *Procedure*

After randomization of the patients into the treatment and control groups, each patient was interviewed using a questionnaire for determining anorexia and bulimia (22). Bulimia nervosa and BED were diagnosed according to the criteria of the Diagnostic and Statistical Manual of Mental Disorders, 4<sup>th</sup> ed (23).

The treatment took place between 1998 and 1999. The sample comprises six treatment and three control groups. The treatment and control groups were included on three separate occasions. The number of participants in the treatment groups varied from 8-12 and in the control groups from 14-15. An attempt was made to maintain heterogeneity in the treatment groups regarding age, education and medical diagnoses. The reason for employing this procedure was that such differences within the groups should function to counter members from identifying with one another's mutual feelings of helplessness.

All patients were followed up regarding weight at the outset of the study, immediately after the end of treatment, and again at 6, 12 and 18 months post-treatment. The weight of the controls was taken at the same times as those of the treatment group, but not at the time corresponding to the end of treatment for the treatment group. Weighing was always done without shoes and with light clothing using a calibrated scale. Those hospital personnel who were not participating in the study checked all the final weight measures. No booster treatments were

administered once the treatment program was terminated.

#### *The cognitive treatment program*

The treatment program used in this study followed a manual (24). The structure of the manual consisted of a group-related cognitive program that included 30 hours divided into 10 lessons given once a week (i.e. the program extended over a 10-week period). Each lesson lasted three hours. In the program evaluation for the first two treatment groups, wishes were expressed as to group information about the treatment program one week before the start of treatment. The four following treatment groups received such information for one hour.

The treatment program included elements from cognitive psychotherapy and psycho-education, as well as a program on food, diet and nutrition (24). The cognitive treatment program focused primarily on possible causes underlying the dysfunctional eating behaviors rather than on eating behavior per se. Special attention was given to deficiencies in self-control, low self-esteem and experiences of stress. Evidence from earlier studies indicates that stress factors initiated by, for example, psychosocial circumstances, can be involved in the appearance of obesity (25, 26). The nutrition program used in this study was well known for the participants, pedagogic and easy to understand. Each lesson ended with a meal based on the nutrition program, which the participants took turns preparing at home.

The purpose of the treatment program was to inform the participants about probable causes of their own dysfunctional eating behavior, as well as to provide them with information that could be useful in changing and controlling such eating behavior. This process was expected to occur during the time of treatment when the participants would learn the following:

Reflect on and identify their thinking and behavior patterns in various life situations (e.g., stress-related situations) that they have experienced and which might have influenced their eating behavior.

Identify those feelings generated by their pattern of thinking and examine the effect of their feelings on eating behavior.

Examine how an alternative way of thinking in these situations could affect eating behavior. Identify the causal connection between their pattern of thinking, feelings and eating behavior.

Each lesson was structured and arranged into four blocks: A, B, C and D.

#### *Block A. Questionnaire manual*

The questionnaire manual consisted of questions about situations that, in different ways,

influenced the patients' eating behavior during the week. The manual had a central role in the treatment work and the questions were administered to the participants in the beginning of each lesson. Group discussions immediately followed administration of the questionnaire. The manual's questions were particularly important when a participant showed an increase in weight and, together with the contents of the treatment program's lectures, contributed significantly to the participants' success in mapping of the causes of the increased weight.

#### *Block B. Previous lesson's homework*

This lesson concerned group discussion and participant analysis of the previous lesson's homework.

#### *Block C. Theme of the lectures*

Each lesson contained its own theme that supplied information from the field of cognitive psychology by first providing facts and then through discussions with and between the participants. Each theme consists of both theory and concrete examples that illustrated the theory. The various themes were cumulative in the sense that each lesson provided new information to the earlier themes. The content of all the themes was related to eating behavior.

#### Examples of lesson themes:

When food has become a compensation for "something else"; how assumptions develop and how basic rules of life can be formed that have meaning regarding the way one conducts oneself in private life, in work and in eating behavior; self-image, self-confidence and eating behavior; associations between thinking, feelings and eating behavior, the cognitive triangle; functional and dysfunctional thought patterns; control and helplessness; stress – positive and negative. Stress is a subjective experience and as such can be altered; the importance of being able to draw one's own boundaries and its significance for eating behavior.

#### *Block D. New homework*

The aim of the homework was that patients should apply and examine the content of the lecture's themes to their daily life activities, especially with regard to their own eating behavior. The homework could deal with how the patients' dysfunctional thought patterns or experiences of loss of control during stressful situations affected their eating behavior. The participants' task in this phase of treatment was to describe during the next group lesson the various situations that occurred and the effect these situations had on eating behavior.

### *The nutrition program*

The patients were invited to build up their own personal diet day by day. The purpose of the nutrition program was to offer the participants a diet program of nutritional value that consisted of 1200-1300 kcal/day, with considerable possibilities to individual variation and with no restrictions regarding forbidden foods (i.e. foods that are believed to slow weight loss). The program was formulated such that the other family members could also use it and that it permitted and stimulated personal variation.

Moderate calorie restrictions that give lower feelings of hunger are considered a positive factor in weight reduction (27). According to Sbrocco et al. (28), persons who have participated in programs that emphasize the individual's own choices and encourage analysis of these choices show larger weight loss at a 1-year follow-up than programs encouraging rigidity and a more restrictive diet. Garner et al. (29) have suggested that a strict dietetic treatment can lead to the development of BED.

Consequently, of central importance in the present treatment program is the notion of supporting the participants' own choices and their planning as to how they wished to use the program: the participants received support for their desire to sometimes exceed (e.g., on special occasions such as parties and birthdays) the recommended calorie intake for weight loss, presuming the calorie intake the next day would be intentionally reduced.

To control daily eating, in the first two or three weeks of the program, the participants were encouraged to weigh the ingredients in their food, but to otherwise use the same food receipts they used before the treatment program. The ambition of the nutrition program was, therefore, to provide the participants the necessary feelings of security so they could focus on the underlying factors of their eating behavior rather than concentrating on their eating behavior as such.

Avoidance strategies of particular foods, sweets or other things that before treatment contributed to loss of control of eating were not used in the present treatment. Instead, the participants were encouraged to pay attention and to discuss their behavior and feelings in different situations that were antecedent to overeating.

The nutrition program was closely linked to the questionnaire manual throughout the treatment period so that the participants could use it to help them in analyzing their eating behavior during each week. At the same time, the participants' relation toward the nutrition program was associated with their experiences and interpretations of events that occurred during the week.

### *Statistical methods*

Student's t-statistic was used to test differences between group means. Differences in proportions between groups were analyzed with the Chi-square test. Statistically significant differences were assumed when  $p < 0.05$  (two-tailed test).

## RESULTS

The mean age of the treatment patients was 45.4 years (SD=9.8, range 21-60 years) and that of the controls was 45.2 (SD=11.3, range 18-60 years); the other demographic data are summarized in Table 1. No statistically significant differences were observed between the treatment groups and the controls at inclusion to the study.

Of the 62 patients that began treatment, 57 (92%) completed the treatment. Of the five persons who discontinued treatment, three reported practical reasons (long distance from the city to the treatment location and difficulties in getting off work) and two persons reported that they did not agree with the treatment method.

Figure 1 shows the mean weight at the inclusion to the study and on four measurement occasions (immediately after treatment and at 6, 12

**TABLE 1**  
Demographic characteristics of treatment groups and controls.

	Treatment groups N (%)	Controls N (%)	$\chi^2$	df	p
Education					
Compulsory comprehensive school	20 (32)	17 (39)	5.5	3	0.13
High school	12 (19)	10 (23)			
Vocational training	10 (16)	10 (22)			
University	20 (32)	7 (16)			
Married or co-habiting	31 (50)	20 (45)	0.2	1	0.70
Given birth to children	44 (71)	29 (66)	0.3	1	0.67
Working full-time or part-time	46 (74)	26 (60)	2.7	1	0.14

and 18 months after the end of treatment) for all the patients (n=57) who completed the treatment and for all the controls (n=43) who participated from the start of the study.

As illustrated in Figure 1, 40 (70.2%) patients from the treatment group participated in the 12-month follow-up. These patients' average weight loss on the 12-month measuring occasion was 10.7 kg (9%) (SD=11.0), indicating a continued weight reduction of 2.4 kg as compared with their weight at the end of treatment in which the average weight loss was 8.3 kg (SD=4.3).

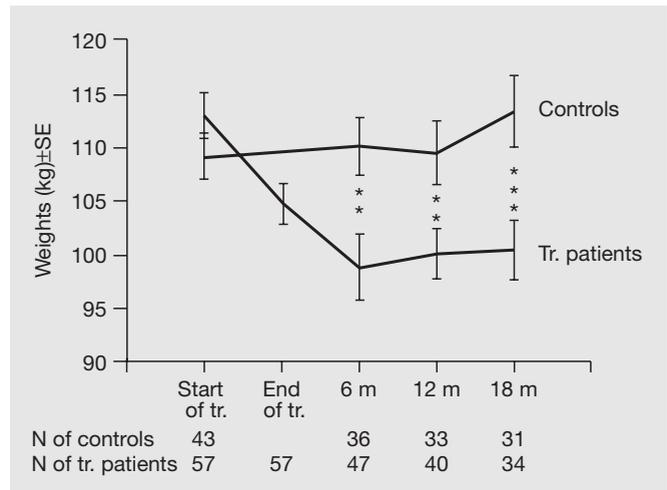
Figure 2 displays the mean weight at the inclusion to the study and immediately after treatment and on the 6-, 12- and 18-month follow-ups for patients and controls with complete follow-up. Thirty-four (60%) of those patients who underwent treatment and 31 (72%) of the controls participated in the follow-up 18 months post-treatment.

The weight difference between the treatment group and the controls at inclusion to the study was not statistically significant. The weight differences between the groups were significant ( $p < 0.01$ ) at all follow-ups. The weight loss at treatment's end (after 10 weeks) was 8.5 kg (SD=16.1) for those patients who had completed the follow-up (n=34). The treatment group showed a mean weight reduction of 10.4 kg (9.4%) while the control group increased in weight with 2.3 kg (2.1%) 18 months after treatment was concluded. Mean BMI was observed to change in the treatment group from 40.4 before treatment to 36.6 18 months after treatment.

Table 2 shows the distribution of weight change between the inclusion and the 18-month follow-up in the treated patients and controls. From the table, it is evident that 12 (35%) patients who underwent treatment evidenced a weight reduction of 10% or more, and of these 12, half indicated a weight loss exceeding 15%.

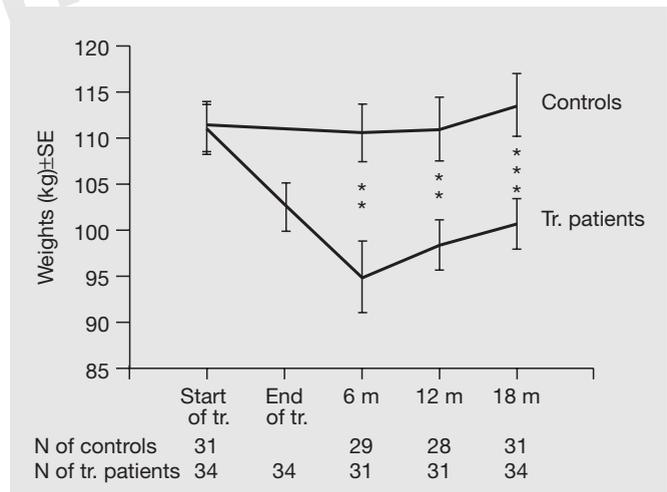
The rate of drop-outs in the 18-month observation period was 40%. Therefore a Baseline-Carried-Forward Analysis was undertaken which showed that the mean weight reduction in those who started treatment (n=62) was 5.7 kg (SD= 9.5) at 18 months after the end of treatment. The mean weight gain in the controls was 1.6 kg (SD=6.0). The difference between groups is highly significant ( $p=0.05$ ). Of those patients who were randomly assigned to the treatment group (n=62), 23 (37%) showed a weight reduction of 5% or more. In contrast of the patients (n=43) randomly assigned to the control group, only four (9%) showed a weight reduction of 5% or more in the Baseline-Carried-Forward Analysis.

Of the patients (n=34) in the cognitive program that participated in the 18-month measuring



**FIGURE 1**

Weight development in treatment group and controls. All patients.



**FIGURE 2**

Weight development in treatment group and controls. Included: Participants at 18 months after end of treatment.

period, 14 showed a weight reduction whereas 20 showed an increase in weight as compared with the 12-month measuring period. All of the patients (n=6) who took part in the 12-month measuring period but not the 18-month period indicated an increase in weight. Of those patients (n=7) who participated only up to the 6-month measuring period, four showed a decrease in weight and three an increase.

Of the 105 patients, 58 (55%) were diagnosed with BED. Of these 58 patients, 34 (59%) (18 were from the treatment group and 16 were from the control group) participated in the 18-month follow-up. Bulimia nervosa was diagnosed in three persons in the treatment group,

**TABLE 2**

Distribution of weight changes between inclusion and 18-month follow-up of treatment group and controls. Included: Participants at 18 months after end of treatment.

Weight change	Treatment group N (%)	Controls N (%)
Gain	2 (6)	22 (71)
Loss less than 5%	9 (26)	6 (19)
Loss 5% or more but less than 10%	11 (32)	2 (7)
Loss 10% or more	12 (35)	1 (3)
Total	34 (100)	31 (100)

whereas none of the patients in the control group were given this diagnosis.

Table 3 shows mean weights (kg) at inclusion and at 18 months in all patients who completed weighing in 18 months after the end of the treatment; mean weights are also given for binge and non-binge eaters.

## DISCUSSION

The new treatment program that is presented in this paper includes methods that are used within cognitive therapy, psycho-education and within the area of dietetics and nutrition. The treatment procedure is under the guidance of a manual, takes place in groups and is of short duration (24). A high proportion (92%) of those who began treatment completed the program. Consequently, the treatment method was acceptable to the majority of the patients.

The main finding is based on the treated patients (60%) who participated in the follow-up phase of the study 18 months after treatment ended and on the controls that participated dur-

ing the same period (72% of controls). The dropout rate at follow-up (18 months after treatment) must be regarded as modest in comparison with numerous other studies revealing high dropout rates during the treatment period (30, 31) or during longterm follow-up (32). Forty-three (75%) patients who completed treatment were still in the study at the 12-month follow-up.

The number of randomized studies evaluating behavior-oriented weight reduction programs with a follow-up period longer than one year is scarce. Earlier research indicates a strong return to baseline weight within one year after treatment ended (1, 3, 33). Cooper et al. (2) argue that the weight increase often begins at the same time that treatment ends; however, this is not so in the present study. The average weight at 18 months after treatment was lower than the average weight at the end of treatment, despite no booster treatment was administered (Fig. 2). The modest weight gain between 12 and 18 months was about the same in treated patients and controls.

It has been shown that a 5-10% loss of body weight produces beneficial change in health risk factors (34-37). The Institute of Medicine (38) publication "Weighing the Options: Criteria for Evaluating Weight-Management Programs" defines treatment success at 5-10% weight loss maintained for at least one year. A report from the UK Royal College of Physicians (39) likewise defines "successful" weight loss as a loss of more than 5% of initial weight. In the present study 67% of the treated patients still fulfilled this success criterion at 18 months after the end of treatment. Only 6% of the treated patients weighed more at 18 months than at baseline compared with 71% of the controls. Altogether, the present results are marked by a favorable outcome.

It is probable that most of the patients who dropped out of the study during the course of the

**TABLE 3**

Mean weights at baseline and at 18 months after the end of treatment. Included: Participants at 18 months after end of treatment.

	Weight (kg) at inclusion Mean (SD)	Weight (kg) at 18 month Mean (SD)	Weight (kg) difference Mean (SD)	p
Binge eaters				
Treatment group (n=18)	115.5 (16.0)	104.3 (15.1)	-11.2 (11.6)	<0.001
Controls (n=16)	109.0 (13.8)	112.0 (14.7)	+3.0 (7.0)	
Non-binge eaters				
Treatment group (n=16)	105.9 (15.1)	96.4 (16.2)	-9.6 (10.1)	<0.01
Controls (n=15)	113.4 (17.3)	114.9 (22.4)	+1.5 (7.1)	
Total				
Treatment group (n=34)	111.0 (16.1)	100.6 (15.9)	-10.4 (10.8)	<0.001
Controls (n= 31)	111.1 (15.5)	113.4 (18.6)	+ 2.3 (7.0)	

follow-up had a less satisfying treatment result than those who participated up to 18 months after the end of treatment. In patients with severe obesity, nonadherence to follow-up may also be due to satisfaction with the weight loss achieved, and we have examples of such behaviour as is also reported in another recent study (32). To get a conservative measure of the long-term efficacy a Baseline-Carried-Forward Analysis was performed (40). In this the mean weight difference between the treatment group and controls was still considerable, 7.3 kg at 18 months.

In a number of studies (10, 11) the importance of a long treatment in obesity has been discussed. The present study demonstrated good long-term results despite using a short-term group intervention without the addition of booster treatments. The group treatment format implies that the cost for the intervention is low. This challenges those notions suggesting that treatment of obesity must always be long term in character.

At this time we cannot determine if the present results are better as compared with traditional cognitive behaviour therapy because in our study there was no such group to compare with. In prior studies the follow-up results were poor (4), however.

The proportion of patients with BED was higher (53% in the treatment group and 52% in the control group) in this study as compared with many earlier studies of patients who sought help for overweight and obesity (12) and therefore supports studies that have shown an over-representation of patients with BED among persons who seek treatment for their obesity (41, 42). Few studies to date have given an account of 1-year follow-up results of CBT treatment of BED. One such study has shown a smaller weight increase during the follow-up period (43). Seeing that BED is likely a complicating treatment factor, the high BED occurrence underlines that the present treatment results must be viewed as very satisfactory.

The treated BED patients were found to show a weight reduction of 9.7%, which can be compared with 9.1% reduction for the other treated patients. This difference is not statistically significant. The question has been raised as to whether BED patients need a special program in order to successfully start controlling and lose weight (44). Thus far, there are no studies, including the present, that indicate that such programs are necessary. The content of the treatment program included the understanding that overeating/inappropriate eating habits are often an expression of a compensation mechanism for negative feelings, which result in a dysfunctional behavioral repertoire to everyday situations that shortly

preceded the act of eating. Analyses of events that preceded loss of control in eating were therefore central to the present treatment approach. Perhaps this approach might explain the good treatment results that were also observed in the BED patients.

What importance does the diet program have regarding the treatment results?

All the participants in the treatment program except one had taken part in a number of weight-reduction programs during their lifetime. The treatment program used in our study is a traditional diet program the participants were well familiar with. Thus there is reason to believe that the diet program's importance for the study results was limited when compared with that of the cognitive program.

## CONCLUSIONS

A striking finding was that nearly all the patients accepted the present treatment program. The results demonstrate that the method is effective in the treatment of obesity in patients with or without BED. The results fail to support the general view that treating obesity always requires long-term programs in order to attain positive results that last for a relatively long time.

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