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Observational Study on Implementation and Effectiveness of Cognitive Behaviour Therapy Targeting Eating Behaviour for Patients with Abdominal Obesity in an Ordinary Primary Health Care Setting

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Abstract

Objective: To describe the implementation of Cognitive Behavioural Therapy Targeting Eating Behaviour (CBT-TEB) and to determine the short-term effectiveness in reducing abdominal obesity and body mass index (BMI) where the therapy was provided in ordinary primary care centres.

Methods: A screening questionnaire was given to consecutive patients and after that a health dialogue, blood pressure and plasma glucose check were offered. Eighty-three persons aged 18-69 years consented to participate in the CBT-TEB intervention. Inclusion criteria were the combination of abdominal obesity and BMI ≥ 25. Primary outcome measures were changes from baseline to six months after end of therapy in waist circumference (WC), waist-to-hip ratio (WHR), weight, and BMI. Changes in eating behaviours: emotional eating and uncontrolled eating, obesity related psychosocial problems as well as patients´ and group leaders´ experiences of the CBT-TEB programme were also assessed. Pulse, systolic and diastolic blood pressure, total cholesterol, high-density lipoproteins (HDL-C), low-density lipoproteins (LDL-C) and triglycerides were measured.

Results: Mean reductions after six months (total sample, last observation carried forward): WC 4.8 (sd 7.0) cm, WHR 0.027 (sd 0.04), weight 4.4 (sd 4.9) kg, BMI 1.6 (sd 1.8) kg/m^2. Mean reductions after six months in therapy completers: WC 5.5 (7.3) cm, WHR 0.031 (0.05), weight 5.0 (5.0) kg, BMI 1.8 (1.8) kg/m^2. Cognitive restraint eating increased and uncontrolled eating, emotional eating and obesity-related psychosocial problems decreased significantly during therapy. Patients´ experiences of the therapy exceeded their expectations. Group leaders´ experiences were positive.

Conclusions: It was feasible to implement CBT-TEB in primary care with health educators and district nurses as group leaders after short training. The therapy was well accepted by patients and staff. The short-term effectiveness of CBT-TEB was satisfying and seems to surpass most or all published CBT-based programmes for reduction of weight and abdominal obesity in patients attending primary care.

Keywords: Cognitive behavioural therapy; Cognitive therapy; Abdominal obesity; Obesity; Effectiveness; Prevention; Eating; Quality of life; Primary care

Introduction

Overweight and weight-related conditions are important causes of cardiovascular disease, stroke and mortality. Abdominal obesity is a stronger predictor for morbidity and mortality than body mass index (BMI) [1-5]. There are strong associations between abdominal obesity and metabolic risk factors such as insulin resistance, lipid disturbances and hypertension. The metabolic syndrome is increasing in many societies which is coupled to the increasing prevalence of overweight and obesity [6]. Given the magnitude of the problems, treatment of obesity and abdominal obesity should be an important prevention task in primary care. However, obesity is often unrecognized in primary care and only a minority of obese primary care patients participate in weight control programmes and few receive advice from health professionals [7,8].

In the past two decades cognitive behaviour approaches have been tried for weight management. A few of them have been implemented in primary care [9-12]. To reach enduring success in primary care it is of vital importance to employ a method that can easily be learnt by district nurses and other ordinary staff personnel at the primary care centres. Cognitive Behaviour Therapy Targeting Eating Behaviour (CBT-TEB) is such a method which seemed worthwile to implement in primary care after

short staff training. The efficacy of CBT-TEB was demonstrated in two randomised controlled trials (RCT) with follow up 18 months after end of therapy [13,14].

The objective of this study was to describe the implementation and to determine the short-term effectiveness of CBT-TEB in reducing abdominal obesity and BMI in patients with abdominal obesity who primarily attended primary care for other health problems and where CBT-TEB was provided by staff members after short training. Moreover, patients´and group leaders´ experiences of the programme were assessed.

Material and Methods

Setting

All (n=8) public primary care centres in Hisingen health care area, Gothenburg, were offered to participate in the CBT-TEB study. Five of them consented to this. The area population (all ages) amounted to 72.300 and is representative for Gothenburg with 500,000 inhabitants.

Ethical approved

The study was conducted with the understanding and the consent of the participants. The study was approved by the regional ethics committee in Gothenburg (No. 032-07).

Screening procedure

All patients, both new and returning, aged 18-79 years attending the primary care centres were invited to anonymously respond to a questionnaire with nine questions about lifestyle, heredity for cardiovascular disease, and level of motivation towards life style change. Thereafter, the persons were offered a self-administered health profile and a physical examination including measurement of blood pressure and blood glucose. Participants were then invited to a health interview based on the results in the health profile and at the same time all measures were presented completed with measures of height, weight, BMI and waist-to-hip ratio (WHR). The feasibility and validity of the questionnaire and the health profile have been reported to be satisfactory when used in primary care [15]. The patient, if needed, had the opportunity to choose among different programmes aimed to lifestyle change and with help from multidisciplinary teams do the training on their own-or abstain from this. CBT-TEB was one of these programmes. If judged appropriate, the person was recommended to see a district nurse when such contact was lacking. The screening procedure is described in more details elsewhere [16].

Enrolment

Persons who were overweight or obese and also suffered from abdominal obesity were informed briefly about the CBT-TEB programme already during the health interview. Those who accepted to be included in the study were given a time for a second interview. This was performed by a group leader.

Inclusion criteria

Age 18-69 years and the combination of (1) waist circumference (WC) >88 cm (females) or >102 cm (males), or WHR ≥ 0.88 (females) or ≥ 1.0 (males), and, (2) BMI ≥ 25 kg/m^2.

Exclusion criteria

The reasons for these were: severe disease with risk of change for the worse; limited qualifications to carry through the programme, or risk for weight changes caused by other factors making evaluation of CBT-TEB effectiveness impossible. Exclusion criteria were: previous anorexia nervosa; endocrine or metabolic disease with or without treatment, except for diabetics who were only on diet, and diabetic drug treated patients who were well known at the primary care centre and who controlled blood glucose regularly; apparent cognitive reduction such as mental retardation, dementia or other cerebral lesion; difficulties in understanding Swedish; current alcohol or drug misuse or dependency; current or previous psychosis; delivery last six months of pregnancy; treatment with weight-reducing drugs during last six months; malignant disease such as cancer, lymphoma, and leukaemia during last five years.

Group formation and training of group leaders

All groups had two group leaders, usually one district nurse and one health educator from the ordinary staff of the primary care centres. Preferred group size was 8-10 patients. Group leaders received 12 h lectures about CBT-TEB before groups started. They studied the treatment manual individually [17]. Lectures were given by author LS. Four hours´ repetition courses were given after 12 and 18 months.

The CBT-TEB programme

The CBT-TEB programme is a short-term cognitive group treatment programme consisting of elements from both CBT and psycho-education. The programme included an introduction followed by 20 h divided into 10 lessions/sessions given once a week over a 10-week period. The sessions included the cognitive main programme, as well as a programme on food, diet and nutrition. The programme followed two manuals: one for the group leader [17] and the other for the patient [18]. The patients´ manual includes a workbook.

CBT-TEB is an educational therapy. The programme follows the schema theory [19,20] and focused primarily on possible causes underlying the dysfunctional eating behaviours, for example: self-image, dysfunctional thought patterns, emotions and behaviours-rather than on eating behavior per se. Special attention is given to deficiencies in self-control, low self-esteem and experiences of stress. Earlier studies [21,22] indicate that stress factors initiated by, for example, psychosocial circumstances, can be involved in the appearance of obesity.

The purpose of the treatment programme was to enlighten participants on 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 behavior. This process was expected to occur during the time of treatment

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when the participants would learn the following: reflect on and identify their thinking and behavior patterns in various life situations (eg. 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 alternative ways of thinking in these situations could affect eating behavior; identify the causal connection between their pattern of thinking, feelings and eating behavior.

The patients were invited to build up their own diet day by day. The purpose of the nutrition programme was to offer the participants a balanced diet 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 programme was formulated such that the other family members could also use it and that it permitted and stimulated variation.

Outcome measures

Primary outcome variables were waist circumference (WC), waist-to-hip ratio (WH), weight and BMI. Secondary outcome variables were pulse, systolic and diastolic blood pressure, total cholesterol, high-density lipoproteins (HDL-C), low-density lipoproteins (LDL-C), triglycerides, blood glucose, the Three Factor Eating Questionnaire (TFEQ) [23] and the Obesity Related Problems Scale (ORPS) [24]. Patients´ expectations before therapy and experiences during therapy were assessed using Eating Disorder Patient´s Expectations (EDPEX 1) [25] and Experiences (EDPEX 2) as well as group leaders´ experiences (customized questionnaire).

Measuring procedure

Medical and social data were gathered from clinical records and by interview. Primary outcome variables were recorded before and after therapy and at six months after end of therapy. Measuring was supervised and recording was performed by independent coordinators. Patients were weighed at the treatment sessions. WC was measured with a tape to the nearest 0.5 cm at the narrowest level between the last rib and the highest part of the iliac crest, and hip circumference at the maximum level over light clothing to the nearest 0.5 cm. Weight was measured (light clothing without shoes) to the nearest 100 g. Height was measured to the nearest 0.5 cm. Pulse was measured sitting. Systolic and diastolic blood pressure were measured in the right arm with the patient in sitting position with a standard mercury sphygmomanometer to the nearest mm. Secondary outcome variables were measured non-fasting before and after therapy.

Questionnaires

Three Factor Eating Questionnaire (TFEQ) comprises three subscales: cognitive restraint (six statements), uncontrolled eating (nine statements) and emotional eating (three statements). Internal consistency reliability, Cronbach´s alpha, varied between 0.76 and 0.85. Construct validity is satisfactory [23].

Obesity Related Problems Scale (ORPS) measures the impact of obesity on psychosocial functioning. Subjects are asked how bothered they are in a broad range of social situations. Higher scores indicate more psychosocial dysfunction. Reliability coefficients are high and construct validity is satisfactory [24].

Eating Disorder Patient´s Expectations (EDPEX 1) was filled-in at baseline. It consists of 14 statements related to the question: “What do you think would help you during treatment?” Each of the 14 items belonged to one of the three subscales Support (5 items), Control (4 items) and Insight (5 items). Inter-item reliability for the subscales Support, Control and Insight is: 0.81, 0.66 and 0.77, respectively [25].

Eating Disorder Patient´s Experiences (EDPEX 2) was filled-in immediately after the 10th CBT-TEB session. It has the same structure as EDPEX 1 and allowed the participants to answer the question: “What did help you during treatment?” Inter-item reliability for the subscales Support, Control and Insight is: 0.86, 0.83 and 0.80, respectively. Principal components analysis reflected the same structure of both EDPEX scales [25].

Customized Questionnaire to group leaders. This was filled-in when the group leaders had experiences from two to four groups each. It consisted of 10 questions and statements about experiences from and attitudes to the CBT-TEB programme. The group leaders were given the opportunity to answer the questionnaire anonymously. The items were: Have you had earlier experience as a CBT-TEB group leader? (no, yes); What opinion do you have about the extent of training? (too little, sufficient, too large); Did you lack guidance (not at all, yes somewhat, yes very much); Five statements with response alternatives are seen in **Table 1**. The finishing question was: Can you imagine yourself proceed as a CBT-TEB group leader in the future? (yes absolutely, yes perhaps, probably not, absolutely not).

Table 1: Eating behaviour (TFEQ) and obesity related psychosocial problems (ORPS) at baseline and change after therapy. Excluded: 7 patients where baseline data were lacking.

Outcome measure	Baseline Mean (sd)	Change after therapy			
		Mean	(sd)	P*)	SRM**)
TFEQ Cognitive restraint	41.1 (17.5)	+2 7.1	(20.6)	<0.000 0	1.32
TFEQ Uncontrolled eating	48.1 (22.1)	-15 .8	(18.9)	<0.000 0	0.84
TFEQ Emotional eating	59.3 (23.9)	-20 .6	(21.7)	<0.000 0	0.95
ORPS	52.7 (27.2)	-14 .1	(23.4)	<0.000 0	0.60

*)Wilcoxon matched-pairs signed ranks test, **)Standardized response mean [26]

Statistical methods

Mean changes from baseline were tested for significance with paired t-tests when effect measures were interval scales. Ninety-five percent confidence intervals were calculated. Wilcoxon matched-pairs signed ranks test was used when effect measures were ordinal scales. Spearman rank order correlation was used. Fisher´s exact test, t-test or analysis of variance were used when between groups differences were tested for significance. Chi-2 distribution test was used. Forward stepwise multiple linear regression was employed to examine the extent to which changes in primary outcome variables could be explained by changes in the different eating behaviours, and, how change in obesity related problems could be explained by changes in the primary outcome variables. Effect size was calculated as change divided by the standard deviation of change (standardized response mean, SRM) [26]. P<0.05 was considered statistically significant.

Results

Eighty-three patients (74 females and nine males) started in 14 CBT-TEB groups. Mean age was 52.8 (sd 11.0) years. All fulfilled criteria for abdominal obesity based on WC and 75 (90%) fulfilled WHR-based criteria. Baseline BMI was 25.0-29.9 in 12% of cases, 30.0-34.9 in 45%, 35.0-39.9 in 33%, 40.0-44.9 in eight percent and ≥45.0 in two percent of cases. Twelve percent were born outside Scandinavia. Twenty-two percent had only elementary school, 46% had passed upper secondary school and 32% had higher education. One percent studied, 48% were working, 14% unemployed, eight percent were on sick leave, 15% had sick pension and 15% had retirement pension. Eight subjects suffered from diabetes. Four of them took antidiabetic drugs and four received dietetic treatment. None of the participants received other kinds of weight loss treatment.

Seventy-one (86%) completed the CBT-TEB programme (63 females and eight males). Completers were older than drop-outs (mean difference 7.4 years; p<0.05). There were no statistically significant differences between therapy completers and drop-outs during therapy regarding sex, education, baseline WC, baseline weight, or expectations (EDPEX 1 total score).

At the 6-month follow up 61 of 83 subjects (73.5%) participated. The drop-outs were younger than those who participated (mean difference 8.0 years; p<0.01). There were still no significant differences between participants and drop-outs regarding sex, education, baseline WC, baseline weight, or expectations. None of these variables predicted the outcomes in the primary effect measures.

Baseline data and mean changes in the primary outcome measures after therapy and at six months post therapy are presented in **Table 2** (intent-to-treat analysis). The proportions of patients who had lost at least five percent of the baseline values at the 6-month follow up were: WC 41%, WHR 28%, weight 39% and BMI 39%. Forty-seven percent had lost 5 cm or more of baseline WC.

Pulse, diastolic blood pressure and total cholesterol level decreased significantly during therapy (p<0.001, p<0.001, and p<0.05, respectively). Changes in other laboratory data did not reach significance.

Eating behaviours changed significantly during therapy in a salutogenic direction according to TFEQ (**Table 1**). Cognitive eating restraint (TFEQ CR) increased and uncontrolled eating (TFEQ UE) and emotional eating (TFEQ EE) decreased. Also obesity related problems decreased significantly during therapy (**Table 1**). In univariate analyses, reductions in all four of the primary outcome variables correlated with diminished obesity related problems (p<0.05). In a forward stepwise multiple regression only a reduction in WC survived as a change which could decrease obesity related problems (adjusted R^2=0.21; p=0.0001).

Table 2: Primary outcome measures at baseline, change after therapy and at 6 months after end of therapy. ITT analysis (N=83), last observation carried forward.

Outcome measure	Baseline Mean (sd)	Change after therapy		Change baseline – 6 months after end of therapy			
		Mean (sd)	P*	Mean (sd)	95 % CI	P*)	SRM**
WC (cm)	111.9 (10.3)	-4.9 (6.7)	<0.0000	-4.8 (7.0)	-6.3, -3.3	<0.0000	0.69
WHR (cm/cm)	0.95 (0.07)	-0.022 (0.04)	<0.0001	-0.027, (0.04)	-0.037, -0.018	<0.0000	0.68
Weight (kg)	96.7 (13.7)	-4.5 (3.9)	<0.0000	-4.4 (4.9)	-5.5, -3.4	<0.0000	0.90
BMI (kg/m^2)	34.6 (4.3)	-1.6 (1.4)	<0.0000	-1.6, (1.8)	-2.0, -1.2	<0.0000	0.89

*)Paired t-test, **), Standardized response mean [26]

In a therapy completers analysis patients who completed therapy (n=71) were included. Baseline data and changes in primary outcome measures after therapy and at six months after end of therapy are seen in **Table 3**.

Table 3: Therapy completers analysis (N=71). Primary outcome measures at baseline, change after therapy and at 6 months after end of therapy. Last observation carried forward.

Outcome measure	Baseline Mean (sd)	Change after therapy		Change baseline – 6 months after end of therapy			
		Mean (sd)	P*	Mean (sd)	5% CI	P*)	SRM**
WC (cm)	112.0 (10.0)	-5.8 (7.0)	<0.0000	-5.5 (7.3)	-7.3,	<0.0000	0.76

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					-3.8		
WHR (cm/cm)	0.95 (0.06)	-0.026 (0.05)	<0.0001	-0.031 (0.05)	-0.042, -0.020	<0.0000	0.68
Weight (kg)	96.5 (13.5)	-5.0 (3.8)	<0.0000	-5.0 (5.0)	-6.1, -3.8	<0.0000	1.00
BMI (kg/m^2)	34.5 (4.3)	-1.8 (1.3)	<0.0000	-1.8 (1.8)	-2.2, -1.3	<0.0000	0.98
*)Paired t-test, **), Standardized response mean [26]							

Effect sizes (SRM) are marginally greater here than in the ITT analysis. The proportion of patients who had lost five percent or more at the 6-month follow up were: WC 48%, WHR 32%, weight 44%, and BMI 43%. Fifty-five percent attained a WC reduction of 5 cm or more. Changes in pulse, blood pressure and laboratory tests after therapy were very much the same as in the ITT analysis.

Changes after therapy towards a healthier eating behavior were somewhat more prominent in the completers analysis. Effect sizes (SRM) of change in cognitive restraint eating (CR), uncontrolled eating (UE) and emotional eating accounted (EE) to 1.60, 0.92, and 1.06, respectively. In univariate analyses, reduced uncontrolled eating (UE) correlated with a decrease of WC (r=0.34; p=0.0043) and WHR (r=0.28; p=0.0211). Reduced emotional eating (EE) correlated with a decrease of BMI (r=0.24; p=0.0462), WC (r=0.41; p=0.0006), and WHR (r=0.24; p=0.0486). Together, the reductions of UE and EE explained 21.5% of the variance (adjusted R^2) in the WC reduction (p=0.0002).

Patients reported modestly positive expectations before therapy (**Table 4**) (mean of four items in EDPEX Control scale=4.5; mean of five items in EDPEX Insight scale=3.8 and EDPEX Support scale=4.0). After therapy, patients rated the components of support and insight in the CBT-TEB programme as significantly more helpful than they had expected (p<0.0001 and p<0.01, respectively). Those features that were regarded most helpful during therapy as reflected in EDPEX 2 scores were: I´ve been helped by increasing control over my eating habits (item 1, score 5.2, sd 0.9); I´ve been helped by someone who has supported and encouraged me during treatment (item 5, score 5.3, sd 1.0); I´ve been helped by eating regular meals (item 8, score 4.9, sd 1.1); It´s been important to have been met with care and consideration (item 13, score 5.1, sd 1.0); I´ve been helped by reflecting on recurring patterns in my life (item 14, score 5.0, sd 1.2).

Table 4: Mean (SD) scores of EDPEX 1 subscales (expectations) before therapy and mean (SD) differences between EDPEX 1 and EDPEX 2 (experiences). Attrition: 7 patients. N=64.

EDPEX Subscale	Expectations at baseline		Difference between expectations and experiences of therapy		
	Mean	(SD)	Mean	(SD)	p*)
Control (4 items)	17.9	(4.1)	+1.1	(4.7)	ns
Insight (5 items)	19.2	(6.5)	+2.2	(6.7)	<0.01
Support (5 items)	20.2	(6.3)	+3.9	(7.2)	<0.0001
*) Wilcoxon matched-paired signed ranks test.					

Only one of the ten group leaders had previous experiences of the CBT-TEB programme. Half of them perceived their training as sufficient. The others felt it was too short. Six of them lacked guidance in the method. Group leaders´ experiences were mostly very positive (**Table 5**). When they were asked the question: "Can you imagine yourself proceed as a CBT-TEB group leader in the future?" nine answered "Yes, absolutely", one answered "Yes, perhaps". None answered "Probably not" or "Absolutely not".

Table 5: Group leaders´ (N=10) experiences (absolute numbers): "How well does these statements agree with your experiences?".

Statement	Disagree totally	Disagree Partly	Agree partly	Agree totally	P*
My competence increased	-	2	1	7	<0.01
My stress increased	7	2	1	-	<0.01
I got interesting experiences	-	-	2	8	<0.001
My self-confidence increased	1	4	2	2	ns
My interest in obesity treatment increased	-	4	2	4	ns
*) Chi-2 distribution test (null-hypothesis: uniform distribution)					

Discussion

To the best of our knowledge, this is the first study to demonstrate that it is feasible to implement a CBT-based group therapy programme for obese patients in primary care with ordinary non-physician staff members as group leaders after short training. The CBT-TEB programme was integrated in a radical change process at the involved primary care centres. The aim of the latter was to change the tasks toward more preventive, health-promoting efforts. The results should be seen against the following circumstances: virtually no patient had consulted with the intent to receive weight loss therapy. Group leaders, except with one, had no previous experience of group therapy. Mean group size was probably suboptimal as our clinical experience indicates better result in larger groups (eight to ten patients). Group leaders were obliged to follow a comprehensive treatment manual which may have compensated for the short training.

In this study, weight loss was somewhat less prominent than in our earlier RCTs with treatment given to patients at a specialized obesity clinic and at an occupational health centre, respectively [13,14]. However, effect sizes (SRM) were large [27] regarding changes in weight and BMI, and moderate for WC and WHR both in ITT and completers analysis six months after end of therapy. Among completers, the difference in effect size between changes in WC and WHR may indicate that the former measure was more sensitive to change.

It is well known that at least five percent loss of body weight produces beneficial change in health risk factors [28-32]. In this respect the programme was successful in 39% (ITT) or 44% (therapy completers analysis) of cases. Beneficial health effects of a WC reduction of 5 cm or more has been proposed [33]. Using this cutoff for WC change about half of the sample should probably have received a salutogenic effect of the programme. As expected, therapy completers seems to have more favourable outcomes.

There is a paucity of studies on CBT-based weight-reducing treatment in primary care. In one such study, mean weight loss in the CBT general practice group was 4.7 kg after one year [10]. However, drop-out rate during therapy was 23% and analysis with last observation carried forward was not performed which may have improved the result. In another study median weight loss six months after end of therapy was 2 kg (ITT) and 4 kg (completers) [11]. Here, the duration of CBT was 4-6 months. In an RCT the weight loss six months after therapy discontinuation was 1.5% in the CBT+placebo arm, and 0.5% in the placebo arm [12]. One study with primary care oriented brief counselling gave a weight loss of 1.7 kg after six months [34]. From the counterweight programme for obesity a weight loss of 3.0 kg after one year was reported [9]. The therapy had a duration of at least one year and included many possible interventions such as dietary and exercise prescriptions, and sometimes pharmacotherapy. The attrition was huge. These circumstances prohibit a meaningful comparison with the present study where the mean weight loss six months after end of therapy was 4.4 kg (ITT) and 5.0 kg (completers) with a small drop-out rate (14%) during therapy.

Although most of the other studies of CBT for primary care patients with obesity rely on relatively long therapy duration the magnitude of the weight loss does mostly not reach up to the result of the present study. It is however difficult to exclude possible differences between studies regarding patients´ willingness to accomplish lifestyle changes regarding food and eating. As a control group was lacking we cannot unconditionally claim that the outcomes were caused by the CBT-TEB programme. However, previous randomized controlled efficacy studies resulted in similar outcome in the CBT-TEB arm whereas a weight gain was seen in the control groups why we conclude that most of the reduction in outcome measures might be therapy effects [13,14]. Future confirmatory studies are highly needed.

Limitations of this study are the short follow up time and that the sample is relatively small. A control group is lacking and too few males were included. Strength is that the programme was feasible to implement in an ordinary primary care setting. Another strength is that all patients who attended the primary care centres regardless of the reason for visiting had the opportunity to be included in the screening procedure during the enrolment period. This might explain why their expectations of therapy were no more than modestly positive. Another strength is that CBT-TEB is a manualized procedure.

The CBT-TEB programme resulted in large changes in all eating behavior variables towards a more healthy behavior especially regarding cognitive restraint. In line with this, increase of cognitive control and hunger reduction after CBT has been reported [10]. We also found that obesity related psychosocial distress decreased during therapy implying that quality of life had increased. In accordance, increase of perceived attractiveness after CBT for weight reduction has been reported [10]. In another study, CBT given to obese subjects resulted in improvements of health-related quality of life in all scales of SF-36 [35]. That CBT directed against obesity or abdominal obesity has positive effects in broad areas of health-related quality of life gives support for such programmes to be implemented in primary care. New findings in the present study were that we found the reductions in EE and UE after therapy being especially related to a decrease in abdominal obesity measured as WC-a potentially highly salutogenic outcome. Moreover, a reduction of WC after therapy was especially associated with a decrease in obesity related problems.

After therapy, participants ranked the support and insight components of the CBT-TEB programme as more helpful than they had expected. In these respects experiences surpassed expectations. Of those five items in the EDPEX 2 questionnaire that were ranked by patients as most helpful during treatment two were related to cognitive restraint, two to support and one to insight components of CBT-TEB. Thus it seemed that all these elements contributed to the positive experience of the programme. Previous studies on primary care patients´ experiences of helpful components in CBT are lacking.

That half of the group leaders perceived that their training in the method was too small is obviously unsatisfactory. Probably inexperienced health care personnel should receive a somewhat enlarged training programme as well as initial guidance during therapy at future implementations. Nevertheless group leaders´ experiences from CBT-TEB were very positive and most felt that their competence increased. Nine of ten could easily see themselves as CBT-TEB group leaders in the future.

Conclusions

It was feasible to implement Cognitive Behaviour Therapy Targeting Eating Behaviour (CBT-TEB) in an ordinary primary health care setting after a short education of staff members. The short-team weight reducing and abdominal obesity diminishing effects of CBT-TEB was satisfying. Most effects were relatively large (SRM>0.8). Although this is an observational study we conclude that most of the reduction in outcome variables might be therapy effects. Although therapy was given by ordinary personnel in primary care the short-time weight loss result of CBT-TEB seems to surpass most or all previous published results of CBT-based weight reducing treatment in primary care

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[9-12,34]. The programme was well received by the patients. All measured components of CBT-TEB (cognitive, supportive and insight elements) were ranked by patients as helpful. CBT-TEB gave positive experiences for group leaders. As CBT-TEB is a group-based treatment of short duration the expenditures are limited. This should make possible a broader implementation of the method. Future confirmatory studies are needed as well as studies on preventive effects of CBT-TEB in patients with abdominal obesity together with other risk factors for diabetes, cardiovascular disease or stroke.

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