Evaluation of a day clinic psychosomatic treatment for eating disorders and obesity

Britta Nimis, Helge Fehrs, Günter Reich

Abstract

The recommended approach for the treatment of obese patients is a holistic treatment concept including not only nutrition and exercise therapy, but also psychotherapy, particularly if there is also an eating disorder. This study examined the effect of a multimodal day clinic treatment on 91 severely obese patients with disturbed eating patterns in a specific waiting group design 6 weeks before treatment, upon admission, upon discharge and 6 months later.

The average BMI was 46 upon initial contact and this, like the symptoms of the eating disorder ('*Fragebogen zum Essverhalten*', FEV), reduced significantly more during the treatment period than during the waiting period. In the pre/post comparison there was a significant improvement in all parameters (BMI, FEV, overall mental health, BSI) and these values remained largely stable in the follow-up examinations. The better psychological well-being and control of eating habits the patients displayed, the more benefit the patients derived. The results underline the need for holistic therapies.

Keywords: obesity, day clinic, psychosomatic, eating disorder, overweight, nutrition therapy

Introduction

The prevalence and severity of obesity in Germany have continually increased: 47% of women and 62% of men in Germany were overweight or obese in the observation period 2014–2015 [1], which has far-reaching consequences on the health system and economic sector [2]. According to the German government's 2015 health report, being overweight (BMI ≥ 25) is a risk factor for chronic disease [3]. Obesity (BMI ≥ 30) leads to increased risk for other medical risk factors, such as type 2 diabetes mellitus, arterial hypertension, disorders of fat metabolism and coronary heart disease [4].

Obesity often goes hand in hand with an eating disorder, such as binge eating disorder (BED). This is characterised by attacks of excessive eating and treatment should focus primarily on the abnormal eating habits and the associated emotions, conflicts and disturbed patterns of physical activity [5]. BED is the most common eating disorder, carrying a risk of obesity 3 to 6 times higher than that of persons without BED [6]. The factors responsible for the strong correlation between obesity and BED are as yet unknown. The treatment of obesity should aim towards realistic therapy goals with long-term weight loss and stabilisation [7]. Particularly when there is also an eating disorder it is neither sufficient for treatment to focus solely on weight loss, nor to concentrate exclusively on the psychopathology of the eating disorder, as is clearly shown in the recent review by Agüera et al. [8]. The authors attribute the high drop-out rates in the empirically effective BED treatments (cognitive behavioural therapy [CBT] and interpersonal therapy [IPT]) to the fact that weight levels remain high and the associated dissatisfaction.

Cooper et al. therefore suggest a treatment concept consisting of both BED-specific and obesity-specific evidence-based therapies [9].

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Initial indications for the effectiveness of an existing multimodal outpatient concept in comparison to standard psychotherapeutic (monomodal) treatment for BED have already been established in a pre/post comparison, but there are no studies on the long-term effect [10]. The metaanalysis by Palavras et al. (2017) found that behavioural weight loss therapy led to a short-term improvement in both aspects (weight loss and BED symptoms), but that this was not fundamentally superior to other treatments [11].
This study examined a day clinic treatment approach which tackles both weight reduction (nutrition and exercise therapy) and BED symptoms (psychoeducation and psychotherapy). Due to the already proven empirical efficacy of this treatment for obesity and BED individually, it is to be expected that the combining of these approaches will also lead to symptomatic improvement.
The aim is therefore to examine the extent to which this multimodal, day clinic treatment leads to weight loss and more healthy eating patterns, as well as improvements in psychological and psychosomatic symptoms and quality of life. In addition consideration is given to why certain patients benefit more than others.

Treatment concept

The treatment concept is designed for patients with a BMI > 30 and at least one physical secondary condition as a result of the obesity (e.g. type 2 diabetes mellitus) who suffer from psychological symptoms or also have an eating disorder. Treatment in the psychosomatic day clinic consists of 30 treatment days which take place from Monday to Friday within a period of six weeks. The goal is to achieve slow and sustained weight loss with corresponding changes in diet, eating habits and patterns of physical activity. Besides a training kitchen, three mealtimes together (midday, 2 snacks) and dietary advice (group: 1 × 90 min/week and individual: 1 × 20 min/week) the treatment also offers various types of sport, Feldenkrais therapy and an information session on surgical interventions. Strategies for regulating emotion and dealing with conflicts are also components of the individual (1 x 25 min/week) and group (3 x 60 min/week) behavioural therapy. The day clinic concept (therapy just on weekdays) is intended to ensure regular transfer to everyday life. The patients are at home in the mornings and evenings and feed themselves, so that they can change their eating habits themselves in their day-to-day lives. For this, the patients are guided by the food pyramid of the German Nutrition Society (DGE), recipes from the training kitchen and individual feedback from therapy. In addition, they try to establish new opportunities for sport and exercise at home. The provision of precisely defined nutrition plans is consciously avoided in order to increase personal responsibility and flexibility. Throughout the treatment period weight (2 x weekly), circulation (blood pressure, pulse) and laboratory results[1] are regularly checked.

Methodology

Study design and procedure

The study is a specific waiting group design with repeated measurements: the results from a six-week period without treatment (waiting period) were compared with those from a six-week treatment period (30 working days). All patients from the waiting group were also allocated to the treatment group. Data was collected at four measuring times: 6 weeks before the beginning of treatment (t1), upon admission to the day clinic (t2), after completion of treatment (t3) and 6 months after discharge (t4). At every measuring time, the objective weight was measured in the clinic.

Data collection instruments

For the collection of symptom data, besides the usual, standardised self-assessment procedure, BMI and the diagnoses of the treating practitioners were also collected.

Fragebogen zum Essverhalten FEV[2]

The FEV records eating habits on the three subscales of "cognitive control", "instability of eating habits" and "experienced feeling of hunger" from 60 items [12]. The scale "cognitive control" correlates to reduced food intake, so means controlled eating behaviour and, according to the manual, should only be interpreted with consideration of the maximum and current weight and the significance attached to being slim. Since all the patients are significantly obese it can be assumed that all the study participants would benefit from increased cognitive control over their eating habits.
The scale "instability" on the other hand correlates to increased food intake. With regard to weight loss, "prognostic validity" can be assumed for both these scales. Internal reliability is given as between 0.74 and 0.87.

Brief Symptom Inventory (BSI)

BSI includes physical and psychosomatic symptoms [13]. Nine scales are established from 53 items: somatisation, obsessiveness, interpersonal sensitivity, depression, anxiety, aggression, phobic anxiety, paranoid thinking and psychosis. These scales are used to calculate the Global Severity Index (GSI), which reflects overall mental health. Internal consistencies are satisfactory at 0.70 to 0.89 for the scales and 0.96 for GSI. Convergent validity is given as correlating highly with similar clinical questionnaire scales.

[1] electrolytes, renal values, liver values, blood count, blood glucose levels, HbA_{1c}, blood lipids, uric acid, TSH, cortisol, PT and PTT, CRP and urine status
[2] The german version of the Three-Factor Eating Questionnaire, Stunkard & Messick 1985

Hospital Anxiety and Depression Scale (HADS)

HADS consists of a total of 14 items which form the scales of anxiety and depression [14]. The German version of HADS shows good reliability at 0.8. Validity was also thoroughly tested and is reliable. The two factors explain around 50% of the variance. Specificity and sensitivity are both given at 0.8.

Quality of life (EQ-5)

The measuring instrument consists of five items and a visual analogue scale (VAS) from "0 = worst" to "100 = best health" for the evaluation of health [15]. The items each have three levels (none, some, extreme problems) and cover the five dimensions of mobility, self-sufficiency, general activites, physical symptoms and anxiety/despondency.

Test/retest reliability is 0.7 for the five items and 0.9 for the VAS. It was also possible to prove validity in numerous studies [16]

Statistical analyses

In order to verify the change hypotheses a linear mixed effect regression model (LMER) was calculated with repeated measurements and axis intercept at study participant level. Here, as well as the most important comparison between the six-week waiting period and the treatment period, the differences between the individual measuring times was also examined.

The level of significance was established at 5% (0.05).

Results

Sample

Among the 91 patients the proportion of women (74.7%) was significantly higher than that of men (25.3%). The average age of the patients was 43.2 years (19–73 years). Almost a third of the patients was unmarried, a little under a third was married and the other third

Marital status			Own children			Currently in a relationship		
single	30	(33%)	none	42	(46.2%)	yes	41 (45.1%)	
married	28	(30.8%)	one child	17	(18.7%)	no	50 (54.9%)	
separated	3	(3.3%)	two children	22	(24.2%)			
divorced	18	(19.8%)	three children	5	(5.5%)			
widowed	3	(3.3%)	four children	2	(2.2%)			
steady partner	9	(9.9%)	not stated	3	(3.3%)			
Highest school qualification			**Highest vocational qualification**			**Current occupation**		
special school	2	2.2%	still studying	6	(6.6%)	trainee/student	4	4.4%
*Hauptschule**	20	22%	compl. apprenticeship	61	(67%)	manual worker	5	5.5%
*Realschule**	42	46.2%	technical college	10	(11%)	skilled worker	4	4.4%
Abitur *	26	28.6%	university	5	(5.5%)	clerical worker	40	44%
other	1	1.1%	other	6	(6.6%)	management employee/ researcher	4	4.4%
			no qualification	2	(2.2%)	civil servant	2	2.2%
			not stated	1	(1.1%)	freelance profession	1	1.1%
Employment status			**Main source of income**			pensioner	7	7.7%
full-time employment	40	44%	employment	57	62.6%	social/national service	2	2.2%
part-time employment	20	22%	parental support	3	3.3%	unemployed	10	11%
not employed	30	33%	education grant	1	1.1%	never worked	7	7.7%
no details	1	1.1%	income support / unemployment benefit / Hartz IV	19	20.9%	other	1	1.1%
			other	11	12.1%	housewife	4	4.4%

Tab. 1: **Sociodemographic data of the patients** (n = 91)

* *Hauptschule*: lower secondary school; *Realschule*: intermediate secondary school; *Abitur*: qualification for higher education

Diagnoses	Waiting group (n = 91)		On admission (n = 91)		On discharge (n = 86)		Catamnesis (n = 62)	
(n = 58)	n	%	n	%	n	%	n	%
Obesity	91	100	91	100	85	98.8	62	100
Eating disorders	76	83.5	78	85.7	84	97.7	32	51.6
Affective disorders	66	72.5	65	71.4	68	79.1	10	16.1
Neurotic, stress-related and somatoform disorders	14	15.4	15	16.5	16	18.6	3	4.8

Tab. 2: **The most common diagnoses given at all measuring times (given by therapists)**

consisted mainly of divorced patients (20%) (◆ Table 1). A little under half were in a steady partnership and half had children.
The highest number of patients had a certificate from an intermediate secondary school (*Realschule*: 46%) and the next highest proportion had attained the qualification required to enter higher education (*Abitur*: 29%). The most common highest vocational qualification was a completed apprenticeship (67%).
The average treatment period of the patients was 40.6 days (SD = 8.5), ranging from 27 to 48 days.
Four patients discontinued treatment and participation in the study. The response rate for the catamnesis examination was 68.1% (n = 62).

Development of body mass index

With an average (mean: M) of 46 (standard deviation [SD] = 7.4) body mass index (BMI) on intial contact was in the range of class 3 obesity (≥ 40). Up to the time of admission 6 weeks later changes were negligible (M = 46, SD = 7.5). By the time of discharge (M = 43.3, SD = 7.4) BMI had reduced on average by 2,7 BMI points. Six months after release (M = 43.9, SD = 7.8) the average BMI had increased by 0.6.

Diagnoses

The diagnoses for the patients were collected by a questionnaire designed for this purpose by the therapists as ICD-10 diagnoses *(International Statistical Classification of Diseases and Related Health Problems)* (◆ Table 2). The most commonly recorded diagnoses were F5 (eating disorders binge eating disorder) and E6 (obesity). At the end of the treatment period an eating disorder was diagnosed in almost all the patients; 71–79% also fulfilled the criteria for affective disorders and 15–19% had diagnoses of neurotic, stress-related and somatoform disorders (F4).

	Comparison of waiting period (w-a) – treatment period (a-d)		
Measuring instruments	Estimate	Std. Error	p
BMI objective	-1.25	0.27	**<0.001**
FEV control	1.84	0.48	**<0.001**
FEV instability	-0.55	0.37	0.135
FEV hunger	-1.33	0.35	**<0.001**
GSI	-0.03	0.04	0.460

Tab. 3: **Comparison between waiting period and day clinic treatment period using a linear mixed model**
values given are estimate, standard error und significance value p
BMI = body mass index; FEV = eating habits questionnaire;
GSI = global severity index;
w-a = waiting period to admission; a-d = admission to discharge

Changes resulting from treatment

The changes are presented illustratively on the basis of the results for BMI, FEV and GSI.[3]

Comparison of waiting period – treatment (stay)

The comparison of the waiting period (registration to acceptance; 6 weeks) and the treatment period (admission to discharge; 5.8 weeks) in the day clinic revealed sifnificant differences in all the aspects covered by the questionnaire except the scale *Instability of eating habits* (FEV) and GSI (BSI) – for these two the values already reduced during the waiting period, so that in comparison there was no further significant difference (◆ Table 3).

Changes during the treatment period

The diagrams in ◆ Figure 1 show that the differences displayed are an improvement in symptoms within the treatment period. Apart from the scale *Control* in the FEV it can be said of all scales: the higher the value the more intense the symptoms. In the specific eating disorder aspect the patients in the pre/post comparison showed significant *weight loss*, more *control* and less *instability* in their eating habits and a normalised *feeling of hunger*. However control over eating habits reduces again significantly by 6 months after day clinic treatment, although it does not reach the starting value (◆ Table 4, ◆ Figure 1). Although the psychological and psychosomatic symptoms (GSI) do significantly reduce during the waiting period, they improve against considerably within the treatment phase (◆ Table 4). Up until the catamnesis examination, GSI then remains stable (◆ Figure 1).
In the treatment period (admission to discharge) the patients improved significantly in all aspects and 6 months after treatment were all stable except for FEV control (see above) (◆ Table 4, column 2).

[2]Additional results can be requested from the authors.

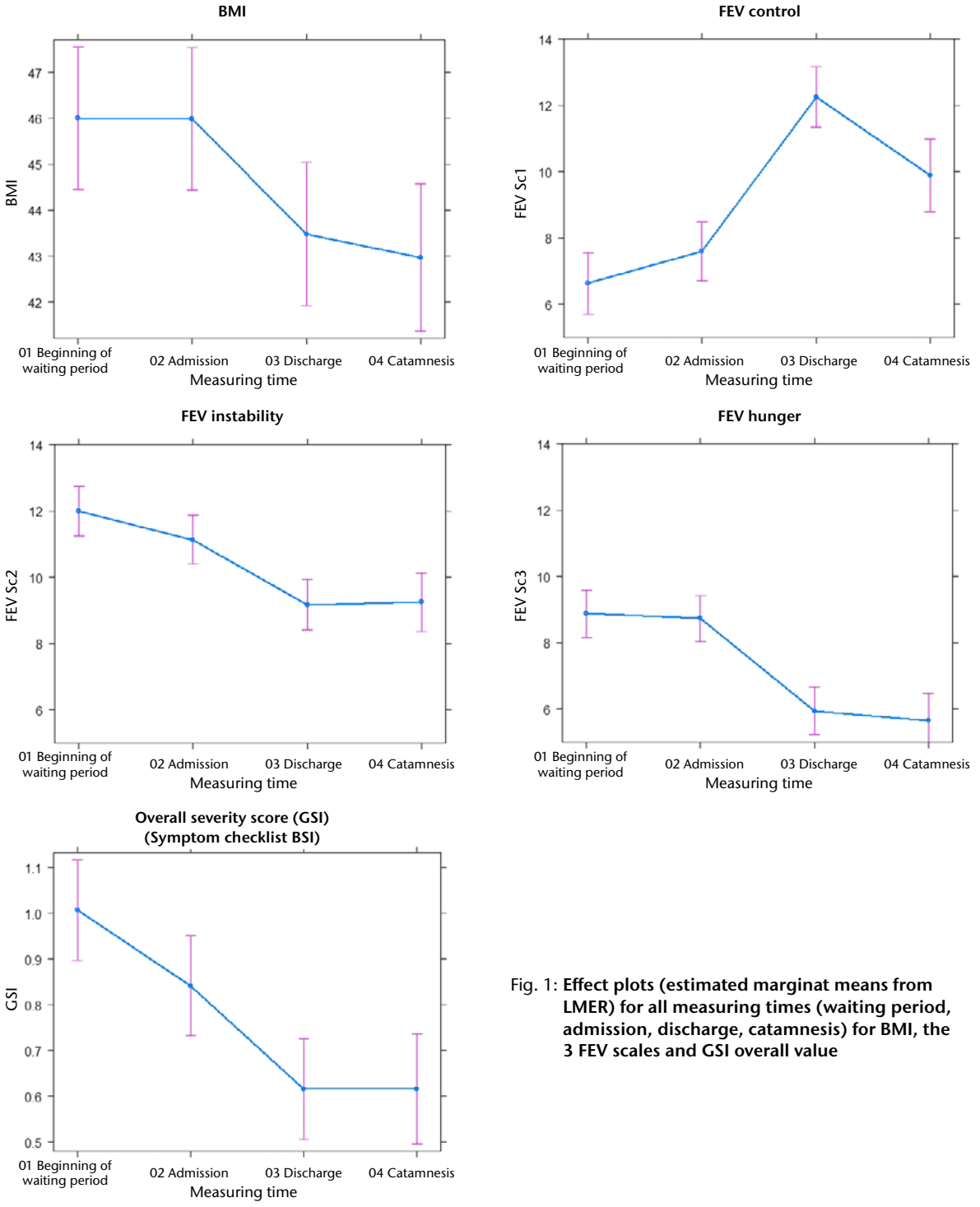

Fig. 1: **Effect plots (estimated marginat means from LMER) for all measuring times (waiting period, admission, discharge, catamnesis) for BMI, the 3 FEV scales and GSI overall value**

Which patients achieve long-term weight loss?

Upon conclusion of day clinic treatment 95.3% of the patients had lost weight (four patients gained 0 to 1 kg). Of the 95.3% of patients, 37.8% gained weight again by six months after treatment and 26.8% continued to lose weight (◆ Figure 2).

◆ Table 5 shows a comparison of the stress scales (incl. HADS and EQ-5) of the two patient groups ("weight losers" vs. "weight gainers") at the beginning and end of the day clinic treatment. The patients who continued to lose weight after day clinic treatment were significantly better able to control their eating habits already on admission and also on discharge (FEV control). Moreover, they had lower anxiety values on admission (d = -0.8) than the patients who later relapsed, and reported higher quality of life (EQ-5 Thermometer; d = 0.6). On discharge too their quality of life was significantly higher (d = 0.5) and they were also much less unstable in their eating habits (FEV instability; d = -0.6).

	Registration - Admission (w-a)				Admission - Discharge (a-e)				Discharge - Catamnesis (e-k)		
Measuring instruments	Esti-mate	Std. Error	p		Esti-mate	Std. Error	p		Esti-mate	Std. Error	p
BMI objective	0.01	0.31	0.984		2.52	0.32	< **0.001**		0.50	0.38	0.184
FEV control	-0.97	0.56	0.086		-4.66	0.56	< **0.001**		2.36	0.64	< **0.001**
FEV instability	0.86	0.43	**0.046**		1.96	0.43	< **0.001**		-0.08	0.49	0.875
FEV experienced hunger	0.14	0.40	0.733		2.80	0.40	< **0.001**		0.28	0.46	0.538
GSI	0.17	0.05	< **0.001**		0.23	0.05	< **0.001**		-0.01	0.05	0.993

Tab. 4: **Comparison of the adjacent data collection times using a linear mixed model**
values given are estimate, standard error and significance value p;
w-a = waiting period to admission; a-d = admission to discharge, d-c = discharge to catamnesis

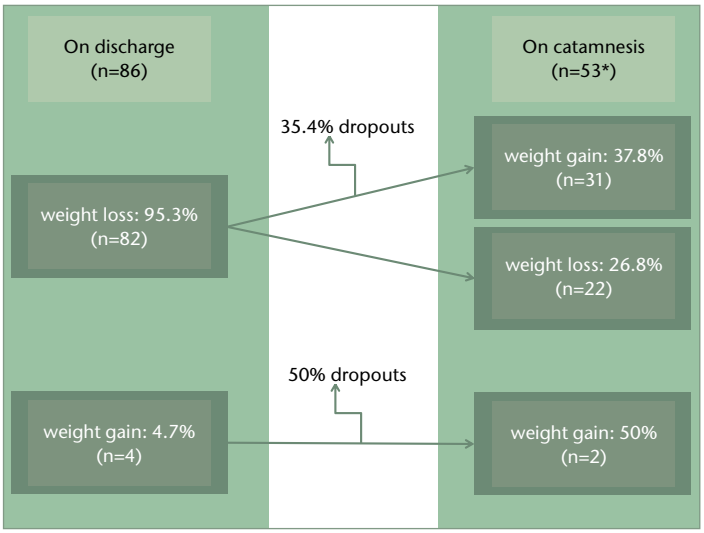

Fig. 2: **Numbers of patients who lost or gained weight during their clinic treatment and up to the follow-up examination (6 months after discharge)**
* Of the total n = 62 who participated in the catamnesis, 9 did not appear for the weighing appointment in the clinic.

A comparison of the differences between starting values and those upon discharge showed that the patients who continued to lose weight later had already lost significantly more weight during treatment than those who later regained weight ($t[51] = -2.18$; $p < 0.05$; $d = -0.6$). All other differences were not significant.

Discussion

This study evaluates the treatment of obese patients in a psychosomatic day clinic for eating disorders and obesity (Asklepios Westklinikum Hamburg). In a specific waiting group design the period between registration and admission to the day clinic was compared to the treatment period. Six months after treatment a catamnesis examination was carried out.
The results show that in the treatment period compared to the waiting period significant improvements were achieved in almost all the aspects examined. Treatment in the clinic resulted in significant weight loss, whereas the prospect of or decision for treatment (waiting period) – in contrast to the effect on mental health (see below) - did not lead to any weight loss.
BMI reduced as a result of treatment on average by 2,7 BMI points, which means an average weight loss of 5.4%. This corresponds to the results of other studies (4.3–4.7% weight loss) on six-week full-time inpatient treatments [17]. This fulfills the research recommendations for a weight loss of 5–10% during obesity treatment in oder to achieve longer-term (1–2 years) weight stability [18]. This weight loss is approximately equivalent (-2.7 BMI points) to the results of the comparative study cited above [10] for the treatment of BED, but only for the multimodal treatment. In standard psychotherapy, in which the focus is on the psychopathology specific to the eating disorder, a weight loss of only -0.6 BMI points is achieved. Diagnoses given included eating disorders and obesity, but also affective disorders and some neurotic, stress-related and somatic disorders. The increase in diagnoses of eating disorders upon discharge (◆ Table 2: 86% vs. 98%) could be interpreted as denial of symptoms at the beginning of treatment. The treatment and information seem to make patients more aware of the extent of their problems, and able to see symptoms in their "habits".

In terms of eating habits and psychological symptoms, the patients also improved significantly during their treatment. The goal of day clinic treatment in line with established medical guidelines [7], not only to help patients to lose weight but also to reduce psychological stress, was therefore largely achieved. The fact that GSI, as a measure of overall psychological and psychosomatic stress, shows no significant change when compared to the waiting period can be explained by the fact that there was already a significant reduction of symp-

	On clinic admission					On clinic admission				
	Pat. with weight **loss** discharge-cat. (n = 22)		Pat. with weight **gain** discharge-cat. (n = 31)			Pat. with weight **loss** discharge-cat. (n = 22)		Pat. with weight **gain** discharge-cat. (n = 31)		
Measuring instrument	**M**	**(SD)**	**M**	**(SD)**	**d**	**M**	**(SD)**	**M**	**(SD)**	**d**
BMI objective	48.1	(8.0)	45.7	(6.8)	--	45.0	(7.8)	43.4	(6.5)	--
FEV control	**9.5**	(5.6)	**6.6**	(3.8)	**0.6**	**14.2**	(2.8)	**10.9**	(3.9)	**1.0**
FEV instability	10.2	(4.1)	11.8	(3.1)	--	**7.7**	(3.4)	**9.8**	(3.4)	**-0.6**
FEV hunger	7.9	(3.4)	9.2	(2.9)	--	5.5	(3.6)	6.4	(3.5)	--
GSI	0.8	(0.4)	0.7	(0.5)	--	0.8	(0.4)	0.7	(0.5)	--
HADS anxiety	**6.5**	(2.4)	**8.8**	(3.4)	**-0.8**	5.2	(3.5)	6.3	(2.9)	--
HADS depression	8.5	(3.8)	9.3	(4.2)	--	4.9	(2.9)	5.7	(3.7)	--
EQ-5 Level Sum Score	8.7	(2.3)	8.8	(1.9)	--	6.9	(1.6)	7.5	(1.8)	--
EQ-5 thermo-meter	**60.1**	(15.9)	**49.2**	(21.4)	**0.6**	**73.7**	(12.5)	**65.5**	(17.7)	**0.5**

Tab. 5: **Comparison of stress levels at the start (on clinic admission; left) and on discharge (right) for patients who continued to lose weight after treatment (discharge to catamensis) and those who regained weight**
Statistical check using t-test. Values given are mean values (M), standard deviations (SD) and Cohen's effect sizes (d).

toms during the waiting period. This is clear from ◆ Table 4, which shows the changes between the individual measuring times. Within the treatment period there is a further significant improvement in overall mental health (GSI). The same applies for the instability of eating habits, these too improve significantly simply as a result of the prospect of treatment.
The catamnesis examination indicates a long-term effect of the treatment: six months after the day clinic all values are stable, except control of eating habits. This effect can also be seen in the comparison study (multi vs. monomodal) by Weipert et al. [10]: There is no decisive change in subjectively assessed control over eating habits even in the pre/post comparison.

A more detailed analysis of the question as to why some patients benefit more than others indicates the following: the less anxiety and the more vitality a patient has and the more control is exerted over eating habits, the more likely it is that there will be lasting weight loss. Psychological well-being (anxiety, vitality) thus seems to be a decisive factor in the treatment of obesity, alongside the ability to exert control. In other studies too controllability remained virtually unchanged [10]. For the treatment of BED and obesity, this indicates that even more consideration should be given to controllabiity, which is apparently difficult to change.

Overall then it can be established that the patients derived benefit from the day clinic treatment and that this is verified by statistical reference figures. However, with this condition additional follow-up examinations are advisable in order to enable long-term assessment.

Limitations

The study design in the form of a specific waiting group enables only limited interpretation. It would be more conclusive to use a completely independent contol group as a comparison. However, this is not possible for ethical reasons among others, since the patients would then be unable to access treatment for a period of at least a year (with the follow-up examination) to ensure that any changes could be attributed to the treatment being studied. The long-term effect of treatment can only be definitively observed by way of further follow-ups at longer intervals (2–5 years).

Conclusion

This study makes clear that in the treatment of obesity – particularly if there is an additional eating disorder – a direct relation to everyday life (day clinic treatment) and a multimodal treatment concept consisting of psychotherapy, nutrition therapy and sport are effective. In all the aspects examined, patients derived significant benefit from the treatment.

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Conflict of interest
Dr Britta Nimis received financial support from Asklepios Proresearch for the research work (planning, implementation, evaluation, etc). As the person responsible for carrying out the study, Dr. Helga Fehrs benefits indirectly from the financial support of Asklepios Proresearch because this enabled an employee to be deployed in the clinic to hand out the questionnaires and deal with administration of the study participants. Prof. Günter Reich declares that there is no conflict of interest.

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