

# The association between mothers' psychopathology, children's competences and psychological well-being in obese children<sup>1</sup>

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**ABSTRACT. BACKGROUND:** *The prevalence of childhood obesity is rapidly increasing, and many obese children suffer from emotional and behavior problems and mental disorders. Associations with social stigmatization of obesity, maternal psychopathology, socioeconomic status (SES) and resilience factors are discussed. OBJECTIVE:* We hypothesize maternal psychopathology to have an impact on the psychological well-being of an obese child. We further hypothesize that competence factors within the child are important key factors that influence the way a child deals with the psychological burden of obesity. **METHOD:** *A referred clinical sample of 59 obese children with their mothers was assessed using a structured clinical interview for DSM-IV diagnosis and questionnaires for child and maternal psychopathology, SES, body mass index (BMI), and percent overweight. Correlations, hierarchical linear and logistic regression models were used to analyze associations between mothers and child and the impact of potential predictors. RESULTS:* Mental disorders were found in 37.3% of the obese children in our sample. Maternal anxiety predicted the mother reported child's internalizing problems as well as the child's depression and anxiety self-report scores. The mental disorder status of the mother predicted the child's internalizing problems, and maternal binge eating disorder (BED) had an impact on the mental disorder of the child. If the child's total competences were included in the hierarchical regression model they predicted the child's outcome in all three subscales of the Child Behavior Checklist (CBCL), thereby reducing the effect of maternal anxiety to influencing the child's depression score only. Neither SES nor the child's percent overweight accounted for the child's well-being. **CONCLUSIONS:** *Although maternal psychopathology and diagnosis of mental disorder had some impact on the psychological well-being of the child, the child's competences showed a significant negative association with the problem scales. More research on parental and children's skills and competences will highlight the complex interaction of childhood obesity, comorbidity of mental disorders, and resilience factors and will lead to additional approaches for intervention.*

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## INTRODUCTION

Overweight in children and adolescents represents an uncontrolled, worldwide epidemic, with health consequences not only for adult life but increasingly also for the childhood years (1, 2). In 1963 5% of boys aged 6-11 years old were obese in the United States (3). This figure rose to 11% in 1994 and 15% in 1999. In the same period the prevalence for 12- to 17-year-old rose from 5 to 15% (1, 3, 4).

This is a three-fold increase of overweight children in a period of 36 years.

Many obese children have psychosocial problems: besides poorer academic achievement (5, 6) and reduced quality of life (7), they suffer from lower self- and body-esteem and have a more negative body image compared with their normal-weight peers (8-11). Emotional and behavior problems and higher rates of mental disorders have all been associated with

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childhood obesity (12-16). Obese children frequently report disturbed eating behavior (17, 18) and binge eating disorder (BED) (19-21).

These findings have been explained by the social stigmatization of obesity and the consequences of bullying and teasing (22-24). However, another explanation could be the transmission of mental disorders in the family. There are numerous studies showing that mental disorders run in families (25-28). Whether this holds true specifically for obese children was examined by Epstein et al., who included maternal psychopathology, socioeconomic status (SES) and child's percent overweight in their hierarchical regression model to test the influence of these factors on the child's psychological functioning (15, 16). Positive associations between maternal psychopathology and SES and the child's emotional and behavior problems were found (13, 15, 16). Existing findings, however, have their methodological limitations, as they mostly rely on maternal reports; no clinical expert diagnoses according to Diagnostic and Statistical Manual for Mental Disorders IV (DSM-IV) (29) were made for children and mothers, and variation in body mass index (BMI) was small in the clinically obese group.

Parental mental disorders often co-occur with marital discord, parenting problems, and socioeconomic factors, and these may constitute be specific and non-specific risk factors for the healthy development of the child (28, 30). The cumulative presence of risk factors such as chronic diseases (e.g., obesity), social stigmatization and parental psychopathology may increase the probability of impaired development of the obese child. However, protective factors such as a healthy parent, outside social support, and the child's own competences may reduce this risk (31-35). The risk-resilience model of the impact of adversities on the child's development proposes a broader perspective on the way a child deals with stressors (31, 33, 35-37). Genetic influences, social environment, parental illness and skills, the quality of relationships with others, and the child's own competences interact and define the outcome and mastery of a chronic stressor such as obesity.

It is the goal of this study to clarify the role of maternal psychopathology and mental disorder in the psychopathological status of the obese child. We hypothesize that the obese child's well-being can be partly explained by maternal psychopathology. To obtain reliable and valid assessment of mothers' and children's psychopathology (38), and to avoid informant bias, we assessed the children's and the mothers' psychological status with structured clinical interviews such as the Kinder-DIPS (39) and

Mini-DIPS (40), in addition to child and parent questionnaires.

Because psychological problems are more frequent among obese than normal-weight children and yet a substantial number of obese children do not show any psychological problems, we examine whether other factors beyond familial transmission influence obese children's vulnerability. We intend to expand existing findings by including the often-neglected resilience perspective, and we hypothesize that we will find decreased rates of mental disorders and behavioral problems with increased competences of the child.

## METHOD

### *Subjects*

Subjects were 59 children (34 girls, 25 boys), aged 8-12 and their mothers, screened for treatment in a family-based behavioral treatment study. The sample was recruited in two half-cantons of Switzerland, Basel-Stadt and Basel-Land, via public announcements and referrals from pediatricians. Of the 184 parents who contacted the institute 121 were excluded (43 were no longer interested, 9 mentioned other reasons, 69 did not meet inclusion criteria). Inclusion criteria were BMI above the 85<sup>th</sup> age- and gender-specific percentile, no severe mental illness such as psychosis, major depression, or substance abuse disorder, and neither the child nor the mother undergoing therapeutic treatment or participating in an alternative weight loss program. Participants had to be free from unstable medical conditions, including diabetes, coronary heart disease, and endocrine disorders. After the telephone screen, 63 subjects were invited to the first interview, after which one did not meet inclusion criteria, two refused to participate, and one dropped out for other reasons, leaving 59 eligible for the study.

### *Measures*

Subjects were weighed and measured, and the BMI and weighted BMI (percent overweight: effective BMI/BMI 50% percentile) were calculated. All of the mothers were interviewed using a structured interview (Mini-DIPS, German short version of the ADIS-R) (40) for the assessment of mental disorders according to the DSM-IV (29). A structured interview assessing DSM-IV disorders in children (Kinder-DIPS, a German interview with established reliability and validity) (39) was conducted with both the child and the mother. BED was evaluated with an interview assessing DSM-IV research criteria for BED in children (41) German versions for child

and parent especially developed for this study; interviews available from the authors. Eating disorder pathology of the mothers was assessed with the Eating Disorder Examination (EDE), a structured clinician's interview with 22 items that are distributed in subscales of dietary restraint, eating concern, shape concern, and weight concern (42) German version (43). Mothers' BED was assessed with an interview according to DSM-IV-TR criteria especially developed for the study (details available from the authors). Mothers also completed the Beck Anxiety Inventory (BAI) (44, 45) and the Beck Depression Inventory (BDI) (46, 47).

The children completed the Children's Depression Inventory (48) (German version) *Depressionsinventar für Kinder und Jugendliche* (DIKJ). It has good validity and is a reliable measure for depressive symptoms in children 8-18 years old. German norms and a clinical cutoff of 18 have been published (49).

The State and Trait Anxiety Inventory for Children (50) was translated into German (STAIK) (51). Composed of two scales of 20 items each, it describes psychological manifestations of anxiety. We only used the trait scale to objectify the more lasting and general propensity to react with anxiety toward stressful events.

The child behaviour checklist (CBCL) is a 138-item questionnaire completed by the parents (52, 53). It provides a standardized description of skills and emotional and behavioral problems in 4- to 18-year-old children. The first part results in three subscales (activities, social competences, and school competences) and a total competences score. The second part yields eight scales of behavior problems (withdrawn, somatic complaints, anxious/depressed, social problems, thought problems, attention problems, delinquent behavior, aggressive behavior) that are subsumed in the two subscales of internalizing and externalizing behavior problems, and a total problems score. Standardized T-scores are available to establish clinical cutoffs (>67 for syndrome scales, >33 for competence scales).

SES was scored as high, middle, or low based on answers to a questionnaire especially

developed for the study (unpublished data, available from the authors) assessing education and occupation of both parents (Table 1).

#### *Statistical analysis*

The associations between mothers and child's continuous psychological questionnaires, maternal BMI and child's percent overweight and SES were analyzed using bivariate correlations.

To determine potential predictors of children's well-being we followed Epstein's model and included several variables concerning mother's psychopathology, SES, and children's percent overweight in three hierarchical regression models (Table 3). Hierarchical regression models allow the testing of potential predictors in the presence of other predictors. The priority order in which the different predictors are entered in the model can have a major influence on a predictor's impact and must therefore be theory based (54).

Independent variables (predictors) were fitted within blocks in the order block 1, block 2, block 3 (Table 2). Three different hierarchical models were set up. In model 1 we accounted for the earlier findings of Epstein et al. and Vila et al. (13, 15, 16) and replicated their regression model. But in addition to maternal report we included child self-report on depression (DIKJ) and anxiety (STAIK) as dependent variables. In model 2 we accounted for recent research in the area of disordered eating and added the new research diagnosis of BED to the block of mental disorders of the mother. In model 3 we hypothesized the child's competences to be a more primary path to the child's outcome in dealing with a chronic disease than maternal psychopathology or child's obesity (31).

Preliminary analysis showed no correlations between a child's competences and the mother's psychopathology nor did maternal psychopathology predict her child's competences. We therefore judged the variable "competences" independent enough to be included in our analysis as an independent predictor variable. For each of the models we conducted a separate analysis for one of the five dependent variables

**TABLE 1**  
Social economic status (SES).

SES	Assignment to activity/job
High	Employee with management function, senior official, freelance graduate work
Middle	Foreman/ forewoman, master craftsman/ master craftswoman, employee with skilled or highly qualified job, official in low or middle work, self-employed in trade and industry or farming
Low	Unemployed, housewife/ houseman, pensioner, job-creation measure, retraining, honorary position, worker, employee with low job skills, trainee, working member of family

**TABLE 2**  
Dependent and independent variables (predictors) of the three hierarchical regression models.  
Each model was applied to the five dependent variables.

Dependent variables of the child	Predictors		
	Model 1	Model 2	Model 3
Total problems (CBCL) Internalizing problems (CBCL) Externalizing problems (CBCL) Depression (DIKJ) Anxiety (STAIK)	Block 1: Psychopathology: depression (BDI), anxiety (BAI), and eating disorder pathology (EDE) of mother	Block 1: Binge eating disorder <sup>a</sup> and mental disorder of mother <sup>a</sup>	Block 1: Child's total competences (CBCL)
	Block 2: Socioeconomic status (SES)	Block 2: Maternal Psychopathology: depression (BDI), anxiety (BAI), and eating disorder pathology (EDE)	Block 2: Maternal Psychopathology: depression (BDI), anxiety (BAI), and eating disorder pathology (EDE)
	Block 3: Child's percent overweight	Block 3: Child's percent overweight	Block 3: Child's percent overweight

<sup>a</sup>Dichotomous variable. German versions of the following tests: CBCL=Child Behavior Checklist, DIKJ=Child Depression Inventory, STAIK=State and Trait Anxiety Inventory for Children, BDI=Beck Depression Inventory, BAI=Beck Anxiety Inventory, EDE=Eating Disorder Examination.

listed in Table 2. We had to restrict the number of independent variables in the model to avoid overfitting (55). The p-values of the various regressions were considered as purely exploratory and therefore no further attempt was made to adjust for multiple testing. In a separate analysis the two categorical variables mental disorder and BED of the child were analyzed using a hierarchical logistic regression model.

Analyses were conducted using SPSS 11.0. To meet regression analysis assumptions (homoscedasticity, normality) the following variables were transformed: the DIKJ total score, the STAIK T-score (all log-transformed), percent overweight of child, internalizing/externalizing score of CBCL, total problems score of CBCL, mother's BAI and BDI score (all square-root transformed).

## RESULTS

### *Psychopathology of children and mothers*

Children were on average 10.27 (s=1.46) years old and were 60.0% (SD=23%) overweight. Their mothers were on average 39.9 (SD=5.1) years old and had a mean BMI of 28.2 (SD=5.8). Twenty-five families had a low SES (42.4%), 29 a middle SES (49.2%), and 5 a high SES (8.5%).

Twenty-two (37.3%) of the children met criteria for a mental disorder according to DSM-IV-TR, 28 (45.9%) had a CBCL total problems score above the clinical cutoff, 25 (41.0%) an internalizing disorder, and 20 (32.8%) an externalizing disorder. Anxiety scores in the sample were high (STAIK: 25.4%, n=15 above clinical cutoff); those for depression were average

(8.5%, n=5 above clinical cutoff). Twenty-one (36.2%) of the children met criteria for a BED. There were no sex differences for any of the above-mentioned characteristics (p>0.05 for all comparisons based on t- or  $\chi^2$ -tests).

Seventeen (27.9%) mothers met criteria for a diagnosis of a mental illness and five (8.5%) for a BED, both according to DSM-IV-TR (29). Five (8.5%) and eight (13.6%) mothers were above the clinical cutoff for depression (BDI) and anxiety (BAI), respectively.

### *Associations between children's and mother's psychopathology, weight and SES*

Mothers anxiety and depression was associated with child's anxiety and depression, and CBCL's total problem score and internalizing problems (Table 3). Eating disordered pathology was however not associated, neither was BMI of the mother associated with a higher psychopathological score in the child.

### *Predictors of children's well-being*

In Table 4 significant predictors of children's well-being of all three models are presented. Mother's BAI and child's total competences (CBCL) were found to be the best predictors of the child's well-being (Table 2). Mother's BAI was positively related to internalizing problems, depression (DIKJ), and anxiety (STAIK) of the child. The child's total competences score was negatively related to the internalizing and externalizing problems score (CBCL) and total problems score (CBCL), as well as to self-reported depression (DIKJ). Further we found a positive relationship between the probability of

**TABLE 3**

Bivariate correlations between children's and mothers' psychopathology, competences, SES and BMI showed significant correlations in the following areas.

	<b>BMI mother</b>	<b>Anxiety mother</b>	<b>Depression mother</b>	<b>Eating-disorder pathology</b>	<b>SES</b>	<b>Self-efficacy</b>
CBCL total problems	-0.196	<b>0.266*</b>	<b>0.369**</b>	0.002	-0.037	-0.181
CBCL internalizing	-0.088	<b>0.454**</b>	<b>0.523**</b>	0.067	0.001	-0.239
CBCL externalizing	-0.230	0.086	0.166	-0.029	-0.039	-0.112
Total competences	0.081	-0.252	-0.174	-0.036	-0.013	0.010
Depression child	0.081	<b>0.638**</b>	<b>0.410**</b>	0.000	0.033	0.051
Anxiety child	0.034	<b>0.447**</b>	<b>0.384**</b>	0.012	0.135	-0.083
% overweight	0.161	<b>0.327**</b>	<b>0.382**</b>	-0.092	<b>-0.357**</b>	-0.129

mental disorder of the mother and internalizing problems of the child.

There was a positive relationship between mother's BED and the probability of a mental disorder of the child [OR: 22.13, 95%CI: (1.345, 364.315) p=0.030, r<sup>2</sup> Nagelkerke=0.271].

## DISCUSSION

The major aim of our study was to analyze the impact of mother's psychopathology on the psy-

chological problems of the obese child. We first analyzed prevalence rates of mental disorders in our sample. As expected the rate of mental disorders in our clinical sample (37% by clinical interview) was much higher than in a normal population of Swiss children and adolescents (22.5%) (56), the assessment by structured interview combining mother and child report underlines the validity and reliability of this result.

We then tested for associations between children's mental health and potential predictors. Our results show significant associations

**TABLE 4**

Hierarchical regression analysis predicting mother- and child-report of psychopathology of the obese child.

<b>Dependent variables of the child</b>	<b>Predictors</b>		
	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>
Total problems (CBCL)			Block 1: Child's total competences (CBCL) (-) (B: -0.404, SE: .082, p<0.001) r <sup>2</sup> =0.434
Internalizing problems (CBCL)	Block 1: BAI of mother (+) (B: 0.324, SE: 0.149, p=0.034) r <sup>2</sup> =0.194	Block 1: Mental disorder of mother (+) (B: 1.443, SE: 0.411, p=0.001) r <sup>2</sup> =0.206	Block 1: Child's total competences (CBCL) (-) (B: -0.241, SE: 0.059, p>0.001) r <sup>2</sup> =0.393
Externalizing problems (CBCL)			Block 1: Child's total competences (CBCL) (-) (B: -0.226, SE: 0.069, p=0.002) r <sup>2</sup> = 0.275
Depression (DIKJ)	Block 1: BAI of mother (+) (B: 2.428, SE: 0.642, p<0.001) r <sup>2</sup> =0.371		Block 1: Child's total competences (CBCL) (-) (B: -0.558, SE: 0.287, p=0.057) Block 2: BAI of mother (+) (B: 2.042, SE: 0.626, p=0.002), r <sup>2</sup> =0.396
Anxiety (STAIK)	Block 1: BAI of mother (+) (B: 0.041, SE: 0.023, p=0.083) r <sup>2</sup> =0.203		

Note. B = slope of regression, SE = standard error of slope, r<sup>2</sup>=r<sup>2</sup> for models 1-3. German versions of the following tests: CBCL=Child Behaviour Checklist, DIKJ=Child Depression Inventory, STAIK=State and Trait Anxiety Inventory for Children, BDI=Beck Depression Inventory, BAI=Beck Anxiety Inventory, EDE=Eating Disorder Examination. Shown are only those predictor variables that are part of a significant block at alpha =0.05 and are themselves significantly related to the dependent variable at alpha = 0.10. The (+) and (-) symbols denote a positive and negative relationship between predictor and dependent variable, respectively. Dichotomous variables BED and mental disorder are coded 0 for no BED/no mental disorder, 1 for BED/mental disorder.



between the psychopathology of obese children and psychological distress of their mothers. Children who had a mother with a mental disorder had a significantly higher risk of having internalizing problems. In line with the literature and our expectations, mothers with a BED did have children with increased probability of a mental disorder (21, 57).

Confirming previous results (13, 15, 16), our hierarchical regression analyses confirmed mother's psychopathology to be a predictor for the child's psychological problems. Epstein suggested that a mother's impact on her child's well-being might be due to her interpretations of the child's psychological status, findings based on mothers' reports only. We showed (13, 15, 16, 58) that maternal psychopathology predicts children's behavior problems also in child-reported, and expert-based sources of clinical assessment of child and mother, which strengthens the validity of our results. The child's percent overweight did not account for additional variance in the psychopathological symptoms of the child. In contrast to Epstein's findings, SES did not predict children's psychological problems in our sample. This may be due to the different social context in Switzerland, and our sample consisting of mostly middle-class children. According to our findings mother's anxiety predicted the child's internalizing problems and the child's self-reported depression and anxiety symptoms, underlining the importance of the inclusion of parents in diagnosis and treatment of obese children. Our results of the associations between mother's psychopathology and child's behavior problems were not as strong and evident as in Epstein's studies (15, 16). Maternal anxiety only accounted for differences in the child's psychological problems, whereas mother's depressive symptoms and eating-disorder pathology did not make an additional contribution. This may be due to different measures and to the fact that our mostly middle-class sample was of lower general psychopathology.

Our second aim was to demonstrate the predictive value of the child's competences for the child well-being. Including the child competences in our hierarchical regression analysis showed this factor to be an important predictor for the child's psychological parameters. The only other predictive variable for the child's depression score was mother's anxiety. The child's overall competence negatively predicted the level of the child's psychological problems, internalizing and externalizing, and was a far better predictor than mother's psychopathology or child's percent overweight. The total competences score includes social and academic skills and number of activities the child

undertakes outside school. Of course the competences are themselves influenced by the family, by the psychological distress of the mother and her own behavior problems, and as expected, they show negative correlations with the child's problem scales. But in our sample they did not show any association with mother's psychopathology nor were they themselves predicted by the child's other CBCL subscales.

Discussing the difficulties of defining the concept of resilience it has been pointed out that resilience can be thought of as outcome or cause, and that distinguishing between the two is difficult (59, 60). In our study we showed that competent obese children exhibit significantly fewer psychological problems, but long-term studies will be needed to establish whether their competences stem from less psychological distress or if they are more resilient in coping with the burden of obesity.

As we are dealing with a group at-risk, we have to ask why there are children who can cope with obesity, still be successful at school and in their peer group, whereas others develop a mental disorder and behavior problems. Obese children are at greater risk of developing behavioral problems and mental disorders than their normal-weight peers. In times of dramatically increasing prevalence rates of childhood obesity, treatment and prevention approaches have to take this into account. In addition, we have to ask why some children can cope with obesity and be successful at school and in their peer group, whereas others develop mental disorders and behavior problems. The results of this study emphasize that including the parents in treatment is one important step toward a successful outcome. Preliminary results of treatment studies with obese children confirm this hypothesis (61-63). Finding ways for the children to achieve competence in the context of adversity may be another important key factor for intervention. A child with good competences at school or in social life can become resilient in dealing with the chronic adversities associated with obesity, such as chronic medical conditions or teasing and social isolation (34). The child's resilience will also predominantly influence the way he or she will deal with the mental illness of a parent. On the other hand, low competences may contribute to the negative social stigma of obese children (5). The treatment of obese children must therefore include efforts to improve their competences.

Our results are limited by several factors. First, our study suffers from the fathers' poor cooperation and lesser involvement in the problems of their overweight children. Second, the interpretation of our results is limited to treatment-seek-

ing populations of obese children and can only be generalized with caution. Third, as our sample consisted of obese children only, the variability of some of our variables was limited, thereby making it more difficult to detect potential associations among variables (deflated correlation). As no normal-weight control group of mothers and children was available, future research should include this for the better understanding of the isolated effect of obesity. Fourth, due to the restricted sample size some of the models we used are likely to suffer from overfitting. Fifth, as our study is cross-sectional in nature we are not able to make any statements regarding causal relationships. To do so, the nature of the associations between child's percent overweight, child's psychological well-being, and mother's psychopathology should be further investigated in prospective longitudinal studies.

Bearing the above-mentioned limitations in mind, we can say that the mother's psychological well-being and eating disorder status has a major influence on general psychopathology, behavioral problems, and frequency of mental disorders in the obese child. However, the presence of competences in the child determines if he or she can cope with the psychosocial burden of obesity. Enhancing resilience factors and including the parents in treatment programs may be the two key factors for intervention in childhood obesity.

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