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Parental Panic Treatment Reduces Children's Long-Term Psychopathology: A Prospective Longitudinal Study

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Children of parents with anxiety disorders are more likely to develop anxiety disorders than children of normal controls [1]. This familial aggregation is due to genetic and environmental influences, whereas it can be assumed that shared environmental influences have the greatest effects during childhood, decreasing with age [2]. While the adverse impact of parental anxiety disorder on child wellbeing is well established, so far, no study has investigated the potential beneficial effects of parental successful anxiety treatment on offspring. The aim of this naturalistic prospective longitudinal study was to get first evidence of whether successful cognitive behavioral therapy (CBT) of parental panic disorder (PD) has a positive long-term impact on children's psychopathology.

Participants were patients with a diagnosis of PD (with/without agoraphobia) with a child aged between 8 and 18 years. Forty-three parents (38 women, mean age before treatment 39.6 years, SD 4.66) were included in the study. Their children's (n = 54, 31 girls) mean age was 12.0 years (SD 2.58, range 8–18). Parents and their children were assessed for symptoms of psychopathology before and after treatment with structured interviews (DIPS, Kinder-DIPS) [3, 4] and self-report measures (table 1). The evaluators were not involved in parental treatment and were unaware of parental outcomes. Patients with PD were offered manualized CBT for PD [5]. Of the 43 participating parents, 35 received panic treatment, while 8 chose not to undergo panic treatment until the follow-up (FU) assessment. There were no statistically significant differences in sociodemographic characteristics, severity of PD and offspring's trait anxiety at baseline between participants who received and those who declined treatment.

After a mean of 6 years after completing the initial interview (minimum 4 years, maximum 10 years, SD 0.9), all patients were invited to participate in the FU evaluation. The time between baseline and FU did not differ between the treated and the non-treated group. Out of the 43 patients, 35 participants (30 women) and 46 offspring (26 girls) agreed to complete the FU. The parents com-

pleted a FU evaluation procedure similar to the initial evaluation, namely, a structured interview [4] and several self-report questionnaires (table 1). At FU assessment, the patient and the clinician independently completed the clinical global impression of change scale (CGIC), a measure to assess post-treatment response immediately after treatment, using a 7-point ordinal scale ranging from marked improvement (1) to marked worsening (7) [6]. By the time of FU, the youngest child was 14 years of age (mean 18.2, SD 2.58). Therefore, all participating children were able to complete the same measurements as their parents.

At FU assessment, 96.7% of the 29 parents who received treatment were free of a diagnosis of PD. In contrast, 66.7% of the 6 parents who declined treatment still fulfilled the criteria for PD at FU. In the treated parent group, the mean CGIC of the patients and clinicians was 2.16 (SD 1.43), and 4.0 (SD 1.4) for patients who declined to receive treatment.

Table 1 shows the results of a series of linear regression models, with offspring psychopathology as the dependent variable and with parental psychotherapy success and child trait anxiety at baseline as the two independent variables, to assess the association of treatment success with offspring psychopathology. We statistically controlled for the variables age and sex of the offspring and the socioeconomic status of the parents, which were considered a priori to be potential confounders. As none of these variables turned out to have a significant effect on any of the dependent variables, we excluded the variables from subsequent analyses. Dependent and independent variables were transformed, if necessary, to meet assumptions for regression analyses. Analyses revealed that the level of parental treatment success was a significant predictor of anxiety sensitivity and the Asthma Control Questionnaire scale 'physical threat' (table 1a). Furthermore, it could be shown that for parents who participated versus parents who did not participate in treatment, receiving psychotherapy treatment (regardless of whether it was successful or not) was a significant predictor of depression (Beck Depression Inventory) of the offspring (table 1b). Effect sizes across all dependent variables (regardless of whether they were significant or not) indicate moderate to strong effects. However, on the diagnosis level, there was no substantial decrease in anxiety diagnoses in children of parents who received treatment compared to children of parents who declined treatment [children of treated parents: before treatment, n = 10 (26.3%), and at FU, n = 12 (31.6%); children of untreated parents: before treatment, n = 3 (37.5%), and at FU, n = 4 (50%)]. Children who met criteria for an anxiety disorder diagnosis at baseline assessment still met criteria for an anxiety diagnosis at FU. However, the sample size is too small for more detailed analysis.

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Table 1. Linear regressions

a Linear regression with baseline State-Trait Anxiety Inventory for Children Trait and parental psychotherapy success as independent variables (n = 46 children)

Dependent variable at FU	B	SE B	β	p	R ² , %	Cohen's d
ASI	7.33	2.27	0.53	0.003*	30.0	1.32
ACQ physical threat	0.24	0.07	0.53	0.004*	29.0	1.28
FSS-III agoraphobia	3.83	1.62	0.40	0.026	25.3	1.15
BSQ	0.37	0.20	0.32	0.074	24.9	1.15
BDI	2.24	2.39	0.18	0.36	4.2	0.42
MI alone	0.16	0.19	0.18	0.39	10.9	0.70
Self-efficacy	-1.39	2.02	-0.14	0.49	4.7	0.45
STAIC-T FU	0.44	3.45	0.025	0.90	2.0	0.28

All p values were adjusted for type I errors using Bonferroni-Holm correction.

b Linear regression of whether parents of the children participated in treatment (n = 38) or not (n = 8) and State-Trait Anxiety Inventory for Children Trait as the independent variables

Dependent variable at FU	B	SE B	β	p	R ² , %	Cohen's d
BDI	-6.03	2.08	-0.44	0.006*	19.5	0.98
STAIC-T FU	-60.39	20.36	-0.41	0.010	20.1	1.01
MI alone	-0.36	0.14	-0.42	0.017	22.4	1.06
ASI	-4.26	2.11	-0.32	0.052	11.4	0.72
ACQ physical threat	-0.14	0.07	-0.31	0.067	9.7	0.65
BSQ	-0.29	0.14	-0.31	0.050	23.1	1.09
Self-efficacy	2.17	1.31	0.27	0.108	9.5	0.65
FSS-III agoraphobia	-1.18	1.34	-0.14	0.387	6.0	0.49

ASI = Anxiety Sensitivity Index; ACQ = Agoraphobic Cognitions Questionnaire; FSS-III = Fear Survey Schedule; BSQ = Body Shape Questionnaire; BDI = Beck Depression Inventory; MI = Mobility Inventory for Agoraphobia; STAIC-T = State-Trait Anxiety Inventory for Children Trait. * p < 0.05, Bonferroni-Holm corrected.

To our knowledge, this is the first study to investigate the association between success of parental anxiety CBT and children's psychopathology 6 years after parental treatment was completed. Our results indicate that parental treatment success was a significant predictor of a better outcome for children's anxiety sensitivity and agoraphobic cognitions 6 years after parents had completed treatment. Furthermore, it could be shown that participation in treatment, regardless of the success of the treatment, had a significant positive effect on offspring. These results remained stable after statistical control for age, sex and child baseline trait anxiety.

The present study points to an intergenerational effect of successful treatment of anxiety disorders. Thus, parental treatment seems to benefit not only the patients themselves, but also their children. Future research should more precisely target parental treatment as a successful strategy for the prevention of mental disorders. Since the design of the present study was only quasi-experimental, we cannot demonstrate causality. However, especially because of its naturalistic design, the results are highly valuable. Nev-

ertheless, the results have to be replicated, since the sample size of parents who declined treatment compared to those who received treatment was very small. However, the effect sizes in this pilot study are high and it can be expected that the effect would be significant in a larger sample as well. In summary, even though there was no decrease in anxiety diagnoses, treatment of parental anxiety disorders appears to have a positive influence on children's symptoms of psychopathology.

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