The Improvement of Individually Defined Problem Behaviors During a Telephone-Assisted Self-Help Intervention for Parents of Pharmacologically Treated Children with ADHD

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Abstract: *Background:* This study examined change in individually defined problem behaviors during a telephone-assisted self-help (TASH) intervention for parents of children with attention-deficit/hyperactivity disorder (ADHD). *Method:* Parents of children with ADHD and functional impairment despite methylphenidate treatment participated in a 12-month TASH intervention (8 self-help booklets plus up to 14 counseling telephone calls). The severity of three individually defined target problems, of ADHD symptoms, and oppositional symptoms were rated at baseline and after 6 and 12 months; parental satisfaction with the intervention was assessed after 12 months. The problems were categorized according to the type of behavior and the disorder to which they were related (ADHD vs. oppositional symptoms). *Results:* Repeated measures analyses of variance revealed a significant decrease in problem severity during the intervention. The change in problem severity was greater than the change in ADHD and oppositional symptoms. Correlations between problem severity and symptom severity were low to moderate. Correlations between the change in problem severity and parental satisfaction were moderate. *Discussion:* The decrease in the individual problem severity during TASH is stronger than the decrease in ADHD and oppositional symptoms. Individually defined problems should be attended to in psychotherapy research to avoid underestimating the benefit of interventions by solely considering standardized measures.

Keywords: attention-deficit/hyperactivity disorder, functional impairment, methylphenidate, telephone-assisted self-help, individually defined problems

Die Veränderung individueller Verhaltensprobleme während telefonassistierter Selbsthilfe für Eltern von Kindern mit ADHS unter Methylphenidat-Medikation

Zusammenfassung: *Hintergrund:* Die Studie untersuchte die Veränderung individuell definierter Verhaltensprobleme während einer telefonassistierten Selbsthilfe-Intervention (TASH) für Eltern von Kindern mit einer Aufmerksamkeitsdefizit-/Hyperaktivitätsstörung (ADHS). *Methoden:* Eltern von 33 Schulkindern mit ADHS, die trotz einer Behandlung mit Methylphenidat residuale Funktionseinschränkungen aufwiesen, nahmen an einer 12-monatigen TASH-Intervention teil (8 Selbsthilfe-Hefte plus bis zu 14 telefonische Beratungsgespräche). Die Eltern schätzten die Ausprägung dreier individuell definierter Zielprobleme sowie die ADHS- und oppositionelle Symptomatik der Kinder zu Beginn, nach 6 und 12 Monaten ein. Zusätzlich beurteilten sie nach der TASH-Intervention ihre Behandlungszufriedenheit. Zur Vorbereitung der statistischen Analysen wurden die individuell definierten Probleme verschiedenen Verhaltens- und Störungskategorien (ADHS vs. oppositionelle Störung) zugeordnet. *Ergebnisse:* Varianzanalysen mit Messwiederholung ergaben kategorienübergreifend eine starke Verringerung der Problemstärke während der Interventionszeit. Die Problemstärke verringerte sich stärker als die allgemeine ADHS- und oppositionelle Symptomatik. Es zeigten sich geringe bis mittlere Korrelationen zwischen der Problemstärke und der ADHS- und oppositionellen Symptomatik sowie mittlere Korrelationen zwischen der Veränderung der Problemstärke und der elterlichen Behandlungszufriedenheit. *Diskussion:* Veränderungen während einer

TASH-Intervention zeigen sich stärker in individuell definierten Problemen als in Symptomfragebögen. Individuell definierte Probleme sollten neben standardisierten Verfahren in der Psychotherapieforschung Berücksichtigung finden, um eine Unterschätzung des Nutzens von Interventionen durch eine alleinige Betrachtung der allgemeinen Symptomatik zu vermeiden.

Schlüsselwörter: Aufmerksamkeitsdefizit-/Hyperaktivitätsstörung, Funktionseinschränkungen, Methylphenidat, telefonisch angeleitete Selbsthilfe, individuelle Problemliste

The recently published German guidelines on the diagnosis and treatment of ADHD (Deutsche Gesellschaft für Kinder- und Jugendpsychiatrie, Psychosomatik und Psychotherapie [DGKJP] et al., 2018) suggest that training should be offered to parents of preschool children with ADHD, to parents of school-age children and adolescents with ADHD who experience mild to moderate functional impairment, and to parents of patients with residual ADHD symptoms under medication. Such parent training can also be conducted as a guided self-help intervention (DGKJP et al., 2018) combining self-help materials with therapeutic contact, for example, by telephone.

A systematic review and meta-analysis of self-help interventions for parents of children with externalizing behavior disorders revealed large effects on parent-rated externalizing behavior problems and parental self-efficacy, moderate effects on harsh parenting, and small effects on lax parenting, parental mood, and parental stress (Tarver, Daley, Lockwood, & Sayal, 2014). Observational studies using a pre-post design (Kierfeld & Döpfner, 2006; Mokros et al., 2015) and randomized controlled trials (Dose et al., 2017; Kierfeld, Ise, Hanisch, Görtz-Dorten, & Döpfner, 2013) demonstrated the efficacy and effectiveness of a German telephone-assisted self-help intervention (TASH) for parents of children with externalizing behavior disorders. Inter alia, effects emerged related to parent-rated ADHD symptoms, oppositional defiant disorder (ODD) symptoms, and parenting behavior. The improvements remained stable at 1-year follow-up (Döpfner et al., 2018; Ise, Kierfeld, & Döpfner, 2015).

A previous randomized controlled trial examined the efficacy of TASH in school-age children with ADHD showing residual functional impairment despite methylphenidate treatment (Dose et al., 2017). Intention-to-treat analyses yielded moderate effects on ODD symptoms ($d = 0.43$) and negative parenting ($d = 0.48$). Per-protocol analyses, which included only the data of families who had completed the intervention, additionally indicated an intervention effect on child functional impairment (ODD symptoms: $d = 0.64$, negative parenting: $d = 0.62$, functional impairment: $d = 0.71$). These effects remained stable when controlling for medication effects. However, a significant effect on ADHD symptoms (per-protocol analysis; $d = 0.52$) should be interpreted with caution, as a con-

founding effect of a change of pharmacotherapy during the intervention could not be completely ruled out.

This study concerns secondary analyses of data gathered in the study by Dose et al. (2017). We examined whether individually defined problem behaviors in children improved during the intervention. At the beginning of the intervention, the parents defined three problematic behaviors of their child they wanted to target during the intervention, together with their coach, for example: “My child needs more than three demands to start doing his/her homework” or “My child butts into telephone conversations.”

In behavior therapy, the individual assessment of problematic behaviors is highly important for treatment planning (Döpfner, Frölich, & Lehmkuhl, 2013). Such a client-guided approach might complement more standardized methods and support clinical science and practice in several ways, for example, by (a) adding specificity to problems that are found using standardized measures, (b) determining specific client priorities, (c) enhancing the therapeutic rapport and alliance, (d) offering foci for an ongoing assessment during treatment and, hence, facilitating the judgement whether treatment influences the problems clients consider the most important, and (e) applying an approach fitting into everyday clinical practice (Weisz et al., 2011).

Nevertheless, despite their high practical relevance, individually defined problems are only seldom considered outcome variables in psychotherapy research. An observational study on an early version of the TASH intervention used in this study found a significant, large pre-post improvement of individually defined problem behaviors ($d = 2.25$; Mokros et al., 2015). This effect was markedly stronger than the change in ADHD and ODD symptoms assessed with standardized measures (ADHD: $d = 1.02$, ODD: $d = 0.57$). Similarly, in a meta-analysis, Lindhiem, Bennett, Orimoto, and Kolko (2016) found that effect sizes for psychotherapeutic interventions were significantly larger for personalized treatment goals than for symptom checklists. However, to our knowledge, no detailed content-related consideration of individually defined problematic behaviors relevant to the treatment of ADHD has yet been published. Moreover, only few publications have compared individually defined problems with other relevant out-

comes, like standardized measures of ADHD and comorbid ODD symptoms or satisfaction with the intervention (e.g., Ise, Schröder, Breuer, & Döpfner, 2015).

In this study, in line with the results of Mokros et al. (2015), we hypothesized that the severity of parent-defined and parent-rated individual problem behaviors would decrease during TASH intervention. Moreover, we correlated individualized and standardized measures, and compared the changes in individually defined problems with changes in standardized measures of ADHD and ODD symptoms as well as the problem severity with the symptom severity at different assessment points. Weisz et al. (2011) reported that a substantial percentage of individually defined problems did not correspond to the items rated to be in the clinical range on a standardized symptom checklist. We therefore hypothesized that individualized and standardized measures do not exactly capture the same constructs. Thus, we expected to find only low-to-moderate correlations between the severity of individual problems at different assessment points and ADHD/ODD symptom ratings or the changes in problem severity and the changes in symptom severity, respectively. Furthermore, based on the results reported by Mokros et al. (2015) and Lindhiem et al. (2016), we expected that the individual problem severity would show a greater change during the intervention than the standardized symptom ratings.

In addition to these hypotheses, we exploratively examined whether individually defined problems would change differently depending on their content-related allocation to categories covering different types of problem behaviors or different disorders (ADHD vs. ODD). Moreover, we examined the association between the change in problem severity and the problem severity at the end of the intervention with parental satisfaction with the intervention.

Methods

The study was registered at ClinicalTrials.gov (identifier: NCT01660425; URL: <https://clinicaltrials.gov/ct2/show/NCT01660425>) and approved by the Medical Ethical Committee of the University of Cologne. All participating parents provided written informed consent.

Design, Participants and Intervention

The main study, which provided data for the current analyses, was conducted as a randomized controlled trial (Dose et al., 2017). Parents in an enhancement group ($n = 51$) participated in a 12-month TASH intervention as an adjunct to routine clinical care (including pharmacological

treatment with methylphenidate) and were compared to parents in a waitlist control group ($n = 52$). Participants were parents of children with ADHD and residual functional impairment despite methylphenidate treatment (for the inclusion criteria, see section 1 in the electronic supplement [ESM]). The intervention consisted of eight self-help booklets on externalizing behavior disorders and parenting strategies (Döpfner et al., 2011) and up to 14 telephone consultations of about 30 minutes each. The booklets and ten of the consultations were provided on a biweekly base during a 6-month intensive phase, four further consultations were provided during a 6-month booster phase (for details, see section 2 in the ESM). The analyses presented here focus on data from families in the enhancement group who completed the intervention ($n = 33$).

Measures

We used a slightly modified version of the Individual Problem Checklist (IPC) taken from the “Therapy Program for Parents of Children with Hyperkinetic and Oppositional Problem Behavior” (THOP; Döpfner, Schürmann, & Frölich, 2007) to assess individually defined problem behaviors. The IPC captures three individually parent-defined target problems to be rated on a 6-point Likert-type scale (for more details, see section 3.1 in the ESM).

We assessed the IPC by telephone at baseline (T1), after the intensive phase at 6 months (i.e., at the tenth telephone consultation; T2), and at the final telephone consultation at 12 months (T3).

Moreover, parents rated ADHD and ODD symptoms on the Fremdbeurteilungsbogen für Aufmerksamkeitsdefizit-/Hyperaktivitätsstörungen (FBB-ADHS, Symptom Checklist for Attention-Deficit/Hyperactivity Disorder; Döpfner, Görtz-Dorten, & Lehmkuhl, 2008) and on the ODD subscale of the Fremdbeurteilungsbogen für Störungen des Sozialverhaltens (FBB-SSV, Symptom Checklist for Oppositional Defiant Disorder and Conduct Disorder; Döpfner et al., 2008) at T1, T2, and T3 and expressed their satisfaction with the intervention using the Client Satisfaction Questionnaire (CSQ; e.g., Plant & Sanders, 2007) at T3 (for a more detailed description of these instruments, see sections 3.2 and 3.3 in the ESM). These questionnaires were sent and returned by post. Where possible, missing data were collected by telephone.

Statistical Analyses

The statistical analyses were conducted using the Statistical Package for the Social Sciences, SPSS version 24 (IBM Corporation, Armonk, NY). The analyses included

data of the 33 families in the enhancement group who had completed the intervention, that is, those who had received all eight booklets and participated in at least nine telephone consultations (per-protocol analyses). Accordingly, we had 99 individually defined problems available for analysis. There were several missing values (see section 4.1 in the ESM). In the case of single missing values for items of the FBB-ADHS, FBB-SSV, and CSQ, the scale scores were computed by averaging the available item scores. Missing data for complete FBB-ADHS and FBB-SSV questionnaires (at T2) and missing IPC data were imputed using the expectation maximization method. The imputation was carried out separately for each measure. We used available T1, T2, and T3 data of the respective measure as predictors.

We performed a repeated-measures analysis of variance (ANOVA) to analyze whether problem severity changes over time, using the mean severity of the three problems per family as the dependent variable. To account for the impact of families who discontinued the intervention ($n = 18$), we additionally performed an intention-to-treat analysis on the change of problem severity over time, including all families who had been randomized to the enhancement group. Again, we imputed missing IPC data using the EM method.

Moreover, because the medication of several children changed during the intervention period (see Dose et al., 2017), we performed a two-factor repeated-measures ANOVA (factor 1: Time, factor 2: Type of change in medication) in the completing families to examine whether these changes influenced the change in problem severity over time. The results and a discussion of this analysis are presented in the ESM (sections 5.1 and 6.1).

To examine whether individually defined problems which captured different types of problem behaviors or which were related to different disorders changed in different ways, we first followed a qualitative approach and developed a category system that differentiated between different types of behavior (e.g., “interrupts others”) at a lower level and between ADHD-related and ODD-related problems at a higher level. The lower-level categories were developed inductively by grouping problems capturing similar types of behaviors. We allocated the 99 individually defined problems each to one lower-level, behavior-related category and one higher-level, disorder-related category (for further details on the development of the category systems and the categorization, see section 4.2 in the ESM). Following the categorization, we performed two-factor repeated-measures ANOVAs to test for differences in the change in problems allocated to different behavior- or disorder-related categories.

In the case of violation of the sphericity assumption, we applied a Greenhouse-Geisser correction to the ANOVAs.

Partial eta-squared (η_p^2) was used as a measure of effect size. According to Cohen (1988), values below .06 are considered as small, values between .06 and .14 as moderate, and values above .14 as large. The significance level of subsequent pairwise comparisons and posthoc tests was Bonferroni-corrected. Cohen’s d was applied as a measure of effect size for the pairwise comparisons. In line with Cohen (1988), we considered effects of 0.20 as small, of 0.50 as moderate, and of 0.80 as large. Confidence intervals (CI) for Cohen’s d were computed using the formula of Algina and Keselmann (2003). We applied the noncentral distribution calculator (NDC; cf. Steiger, 2004) to determine confidence intervals of the noncentral t -distribution, in order to then derive confidence intervals for d from these confidence intervals.

We calculated Pearson’s correlation coefficients to examine the association between individual problem severity and ADHD and ODD symptoms at the different assessment timepoints (or between the change in ADHD/ODD and the change in problem severity), and between problem severity (or the change in problem severity) and parental satisfaction with the intervention.

In order to compare changes in problem severity with changes in ADHD and ODD symptoms assessed with standardized measures, which were already known from the main study (Dose et al., 2017), we assessed the symptom changes using repeated-measures ANOVAs and subsequent pairwise comparisons. Cohen’s d for the pairwise comparisons and the respective confidence intervals were determined and compared between the analyses on the individually defined problems (see above) and the analyses on ADHD and ODD symptoms.

As an indicator of the clinical significance of the results, we used McNemar’s test to examine how the proportion of families with a clinically nonsignificant mean problem severity changed over time. Several tests were performed, with each analysis including two assessment timepoints to be compared. Because there are no normative data for the IPC, we based the cut-off value for clinically significant symptoms on clinical experiences. Values ≤ 2 were considered as clinically nonsignificant, as families choosing this value usually barely express any strain.

Results

Participant Flow and Sample Characteristics

Detailed information on participant flow may be derived from the publication of the main study (Dose et al., 2017). Thirty-three out of the 51 families (65%) who had originally been randomized to the enhancement group completed the intervention. Children in this group had a mean

age of 9.86 years ($SD = 1.47$) at the beginning of the intervention; 23 (70 %) were boys. In most cases ($n = 30$; 91 %), the biological mother participated in the telephone consultations. On average, the parents made use of 13.64 ($SD = 1.10$; range: 9–14) telephone consultations.

Global Change in Problem Severity

A repeated-measures ANOVA revealed a significant reduction in problem severity over time both in the analyses including data of the families who completed the intervention and the intention-to-treat sample (see Table 1). Subsequent pairwise comparisons showed a large reduction in problem severity between T1 and T2, and a further significant, but small, reduction between T2 and T3 (see Table 2).

Behavior- and Disorder-Related Categories and Change in the Associated Problems

Analyses on the change of problems belonging to the different behavior- and disorder-related categories yielded a similar pattern as the analyses on the global change in problem severity. Details on these analyses are provided in the ESM (section 5.2, Figure S1 and Table S1).

Comparison of Problem Severity and Symptoms

The correlation between the FBB-ADHS and the ADHD-related problems and the correlation between the ODD scale of the FBB-SSV and the severity of the ODD-related problems were low to moderate at all assessment time-points. The correlation between changes in problem severity and changes in ADHD symptom severity from T1-T3 was moderate; changes in problem severity and changes in ODD symptoms correlated highly (see Table S2 in the ESM).

Repeated-measures ANOVAs revealed a significant reduction in ADHD and ODD symptom severity over time

(see Table 1). Pairwise comparisons showed a moderate decrease in ADHD symptom severity and a large decrease in ODD symptom severity between T1 and T2. ADHD and ODD symptom severity remained stable between T2 and T3 (see Table 2). The effect sizes for the reduction in problem severity between T1 and T2 were larger than those for the reduction in symptom severity; there was no overlap between the related confidence intervals (see Table 2).

Clinical Significance

At T1, all families showed a clinically significant mean problem severity. The mean problem severity had changed to a clinically nonsignificant range in 18 families at T2 (55 %) and in 25 families (76 %) at T3. McNemar's test indicated that a significantly higher proportion of families had a nonclinically relevant problem severity at T2 compared to T1. This distribution remained stable between T2 and T3.

Associations Between Problem Severity and Parental Satisfaction with the Intervention

A moderate negative correlation emerged between the mean parental satisfaction with the intervention and the mean problem severity at T3 ($r = -.40$, $r^2 = .16$, $p = .02$). Additionally, there was a moderate positive association between parental satisfaction and the change in problem severity during the TASH intervention ($r = .43$, $r^2 = .18$, $p = .02$).

Discussion

This study examined changes in individually defined problem behaviors during a TASH intervention in a sample of school-age children with ADHD who showed residual functional impairment despite methylphenidate treatment. Both per-protocol and intention-to-treat analyses

Table 1. Change of problem severity, ADHD, and oppositional defiant disorder symptoms during telephone-assisted self-help

	Variable	<i>n</i>	T1		T2		T3		<i>F</i>	<i>df</i> ₁	<i>df</i> ₂	<i>p</i>	η_p^2
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>					
Per-protocol sample	IPC	33	3.95	0.66	2.00	0.89	1.59	0.94	118.83	2	64	< .01	.79
	FBB-ADHS	33	1.61	0.55	1.26	0.49	1.18	0.61	14.86	1.67	53.31	< .01	.32
	FBB-SSV (ODD)	33	1.72	0.60	1.21	0.61	1.14	0.75	19.87	1.64	52.60	< .01	.38
Intention-to-treat sample	IPC	51	3.94	0.64	2.06	0.72	1.65	0.79	207.26	1.69	84.40	< .01	.81

Note. The table displays the results of single-factor repeated-measures analyses of variance. T1 = baseline, T2 = assessment point at 6 months, T3 = assessment point at 12 months; IPC = Individual Problem Checklist, FBB-ADHS = Symptom Checklist for Attention-Deficit/Hyperactivity Disorder, FBB-SSV (ODD) = Oppositional Defiant Disorder scale of the Symptom Checklist for Oppositional Defiant Disorder and Conduct Disorder; *n* = sample size, *M* = mean, *SD* = standard deviation, *F* = empirical *F*-value, *df* = degrees of freedom, *p* = significance value, η_p^2 = partial Eta-squared (effect size).

Table 2. Changes of problem severity, ADHD, and oppositional defiant disorder symptoms during telephone-assisted self-help: Pairwise comparisons of the assessment points

		Paired differences						
	Variable	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>	95 % CI for <i>d</i>
Families completing the intervention	IPC							
	T1 vs. T2	1.96	0.89	12.58	32	< .01	2.49	1.65, 3.00
	T1 vs. T3	2.37	1.07	12.72	32	< .01	2.91	2.00, 3.62
	T2 vs. T3	0.41	0.85	2.75	32	.03	0.44	0.12, 0.85
	FBB-ADHS							
	T1 vs. T2	0.35	0.43	4.66	32	< .01	0.68	0.32, 0.94
	T1 vs. T3	0.43	0.58	4.25	32	< .01	0.73	0.37, 1.17
	T2 vs. T3	0.08	0.41	1.05	32	.90	0.14	-0.12, 0.39
	FBB-SSV (ODD)							
	T1 vs. T2	0.52	0.57	5.17	32	< .01	0.85	0.43, 1.14
	T1 vs. T3	0.59	0.70	4.85	32	< .01	0.87	0.47, 1.31
	T2 vs. T3	0.07	0.46	0.89	32	> .99	0.10	-0.13, 0.35
Intention-to-treat sample	IPC							
	T1 vs. T2	1.88	0.82	16.44	50	< .01	2.74	2.00, 3.20
	T1 vs. T3	2.29	1.02	16.07	50	< .01	3.17	2.43, 3.89
	T2 vs. T3	0.41	0.71	4.10	50	< .01	0.53	0.27, 0.85

Note. IPC = Individual Problem Checklist, FBB-ADHS = Symptom Checklist for Attention-Deficit/Hyperactivity Disorder, FBB-SSV (ODD) = Oppositional Defiant Disorder scale of the Symptom Checklist for Oppositional Defiant Disorder and Conduct Disorder; T1 = baseline, T2 = assessment point at 6 months, T3 = assessment point at 12 months; *M* = mean (of paired differences), *SD* = standard deviation (of paired differences), *t* = empirical *t*-value, *p* = Bonferroni-corrected significance value, *df* = degrees of freedom, *d* = Cohen's *d* (effect size), CI = confidence interval.

revealed a large improvement in individual problem severity during the 6-month intensive phase and a subsequent stabilization in the 6-month booster phase. The effect size of the change during the complete 12-month intervention period ($d = 2.91$ in completing families, $d = 3.17$ in the intention-to-treat analysis) is comparable to that reported by Mokros et al. (2015; $d = 2.55$). The pattern of large improvement during the intensive phase and stabilization in the booster phase emerged for the total score, covering all individually defined problems, and for the single problem behavior- and disorder-related categories. Thus, the improvement did not depend on whether the problems captured ADHD- or ODD-related problematic behaviors. These results are in line with the findings of the main study (Dose et al., 2017), which demonstrated the effects of the TASH intervention on ADHD symptoms, ODD symptoms, and functional impairment (per-protocol analyses). Furthermore, they correspond to meta-analyses indicating effects of behavioral interventions on ADHD and ODD symptoms when these effects are rated by persons who are

directly involved in the intervention (Daley et al., 2014; Sonuga-Barke et al., 2013).

As expected, we only found low-to-moderate correlations between problem severity and DSM-defined ADHD and ODD symptom severity at all assessment timepoints and between the change in problem severity and changes in symptoms. This indicates that individually defined problems capture a construct that is distinct from symptoms as defined by the classification systems. This agrees with the observations by Weisz et al. (2011) that the individually defined problems most important to the patients or their caregivers added specificity to the information assessed with standardized symptom checklists, and that a high percentage of these problems did not correspond to standardized items with scores in the clinical range. The authors highlight that their Top Problems assessment complements standardized measures of symptoms by adding information on client problem priorities (Weisz et al., 2011). Moreover, the individually defined problematic behaviors actually showed greater improvements than

ADHD and ODD symptoms. In other words, individually defined problems seem to reflect changes in disorder-related behaviors more strongly than standardized measures. This agrees with the findings by Mokros et al. (2015) and with the results of a current meta-analysis on the comparison of intervention effects on personalized treatment goals and symptoms checklists (Lindhiem et al., 2016). Lindhiem et al. (2016) stress that psychotherapy might be more effective in helping patients to reach individual goals than in reducing symptoms as assessed with standardized measures. They conclude that the sole consideration of intervention effects on symptom checklists might lead to an underestimation of the real benefit of psychotherapy. This might also be true for the TASH intervention: Because the TASH intervention was tailored to the parent-defined problems, one might conclude that the parents were able to successfully apply the TASH intervention techniques to a wide range of specific problem behaviors and, hence, to achieve their individual goals. This is possibly the mechanism of change that leads to the positive effects of the intervention on more global ADHD and ODD symptoms.

Overall, these results hint at the importance of assessing specific problem behaviors in addition to utilizing standardized symptom measures. In clinical practice, the assessment of individually defined problems helps to gain a detailed impression of the patient's situation and to better address this situation. In psychotherapy research, it enables researchers to better judge the individual benefits of an intervention. Other measures to assess individualized problem behaviors or treatment goals are the Goal Attainment Scaling (Kiresuk & Sherman, 1968), the Top Problems measure introduced by Weisz et al. (2011), and the Individualized Goal Achievement Rating (e.g., Kolko, Campo, Kelleher, & Cheng, 2010). These measures have demonstrated satisfactory psychometric properties (cf. Lindhiem et al., 2016; Weisz et al., 2011). Several authors have highlighted the advantages of applying measures of individualized problem behaviors or treatment goals, respectively, in addition to standardized measures of symptoms. These include the identification of problems most relevant to patients or their caregivers, a stronger involvement of patients and their caregivers in the diagnostic and therapeutic process, the possibility to steadily monitor the patients' development and contribute to ongoing treatment planning and clinical supervision, and a shortened time needed for assessment and monitoring, as in contrast to standardized measures, individualized measures only consist of items relevant to patients (Lindhiem et al., 2016; Weisz et al., 2011).

Analyses of clinical significance revealed that about half of the families (55%) had a clinically nonsignificant mean problem severity after the intensive phase; this rate

increased to 76% by the end of the intervention. Thus, we may suppose that there was no further need for treatment regarding the targeted problem behaviors in these families. The rate of clinical improvement found in this study was slightly larger than that reported by Mokros et al. (2015), who observed that 67% of their participants demonstrated clinically nonsignificant individual problematic behaviors at the end of the intervention. This difference might be due to differences in the sample compositions (Mokros et al.: less restrictive inclusion criteria, children with and without medication), but also to methodological issues. Mokros et al. (2015) used a combination of the reliable change index (Jacobson & Truax, 1991) and the approach applied in this study to determine clinical significance.

The lower the problem severity at the end of the intervention, and the greater the improvement in individual problem severity, the more satisfied parents were with the intervention. These associations were moderate. The relationship between treatment satisfaction and symptoms at the end of treatment or symptom change during treatment, respectively, is in line with several results from previous literature (e.g., Acri, Bornheimer, Jessell, Flaherty, & McKay, 2016; Godley, Fiedler, & Funk, 1998; Turchik, Karpenko, Ogles, Demireva, & Probst, 2010). However, from an overall perspective, results on these associations are somehow inconclusive (for a detailed discussion of this issue, see section 6.2 in the ESM).

Some limitations of this study should be considered. First, we cannot definitively conclude that the improvement in problem severity was attributable to the TASH intervention, as we were unable to compare the problematic behaviors to the respective data from a control group. However, the analyses of standardized measures showed significant treatment effects compared to a waitlist control group (Dose et al., 2017). Second, the problem severity was rated by the parent who participated in the intervention, so that social desirability or effort justification might have biased the results. On the other hand, parents might be more competent in judging changes in the family environment than a blinded assessor (cf. Tarver et al., 2014). Third, the cut-offs for the clinical and nonclinical range of problem severity were based on a clinical decision. Thus, we were unable to compare the results with a normative sample. Hence, we may consider the results of the respective analyses as indication for the further need for treatment of the participants. However, they require replication in studies including a normative control sample. Fourth, we may not draw conclusions for families who discontinued the intervention (dropout rate of about 35%). There were no differences in baseline ADHD symptoms or baseline ODD symptoms between completers and noncompleters (Dose et al., 2017). However,

in noncompleting families, parents had a lower educational level and showed more negative parenting behavior, children had fewer social competences, and there were more siblings living in the same household as the child with ADHD (Dose et al., 2017). Thus, our findings are possibly not applicable to families with a lower educational level or more stressors.

Although the current study, like several previous studies, points to some advantages of assessing individual problem behaviors, only few studies involving respective measures exist (cf. Lindhiem et al., 2016). Thus, more studies including individualized measures of problem behaviors or treatment goals are required to replicate the findings of this study and former studies. Moreover, there are currently several different approaches to individualized assessment; a comparison of the different approaches might be helpful to enrich future research (cf. also Lindhiem et al., 2016). Specifically regarding TASH, future studies should consider individually defined problems as an outcome variable in randomized controlled trials. Moreover, the long-term effects of TASH interventions on individually defined problem behaviors remain to be examined.

Electronic Supplementary Material

The electronic supplementary material (ESM) is available with the online version of the article at <https://doi.org/10.1024/1422-4917/a000726>.

Additional Information for “The Improvement of Individually Defined Problem Behaviors During a Telephone-Assisted Self-Help Intervention for Parents of Pharmacologically Treated Children with ADHD.”

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Conflicts of interest

Manfred Döpfner was involved in the development of the booklets used for the telephone-assisted self-help intervention. He has received consulting income and research support from Lilly, Medice, Shire, Janssen Cilag, Novartis, and Vifor as well as research support from the German Research Foundation, the German Ministry of Education and Research, and the German Ministry of Health. He has received royalties from books and psychological tests published by Guilford, Hogrefe, Beltz, and Huber. Christina Dose was involved in providing the counseling telephone calls. Manfred Döpfner and Christina Dose are preparing the publication of self-help materials similar to those used in this study. Friederike Waschau and Elena von Wirth declare no conflicts of interest.

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