

Cognitive Emotion Regulation Strategies Moderate the Effect of Parenting Self-Efficacy Beliefs on Parents' Anxiety Following Their Child's Surgery

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Objective To explore the role of cognitive emotion regulation (CER) in the association between parenting self-efficacy (PSE) and state anxiety in parents of children undergoing surgery. **Method** In a prospective design, parents of 114 children admitted to hospital for planned surgical interventions completed self-report questionnaires assessing PSE, CER, and state anxiety. Mediation and moderation analyses were conducted to test competing theoretical models regarding the role of CER in the relationship between PSE and parents' anxiety. **Results** The mediational model was rejected, whereas the findings supported a moderational model. The use of nonadaptive CER moderated the effect of PSE on parents' anxiety. Higher PSE only predicted lower postsurgery anxiety when low use of nonadaptive CER was present. **Conclusions** Interacting cognitive factors contribute to parents' anxiety after a child's surgery. Both PSE and CER should be targeted in parent interventions promoting successful adjustments to surgery on children.

Key words anxiety; health care services; parents.

Introduction

The potential negative effects of experiencing illness and undergoing pediatric surgery on children's psychological well-being have been previously documented in the literature (e.g., Kain, Mayes, Caldwell-Andrews, Karas, & McClain, 2006; Kazak et al., 2006; Landolt, Vollrath, Ribl, Gnehm, & Sennhauser, 2003). Importantly, such experiences can also undermine parents' psychological well-being (Ben-Amitay et al., 2006; Hug, Tönz, & Kaiser, 2005). For example, in one study, more than a quarter of parents of children who underwent surgery reported clinically significant symptoms of anxiety and/or traumatic stress in the first 24 hr after the intervention (Scrimin, Haynes,

Alto, Bornstein, & Axia, 2009). High levels of parental anxiety related to a child's illness and hospitalization has been shown to be associated with poorer child and family outcomes after discharge (Kazak et al., 2006). Such anxiety can interfere with parents' ability to effectively respond to their children's needs (LaMontagne, Hepworth, Pawlak, & Chiafery, 1992) and may compromise adherence to treatment (Streisand, Braniecki, Tercyak, & Kazak, 2001). Therefore, it is crucial to identify parents who are at risk of significant anxiety following their child's hospitalization, and to promote their successful coping (Melnyk, 2000).

One important risk factor for parental anxiety following children's surgery may be related to parents' self-efficacy beliefs (PSE), that is, "parents' beliefs in their

ability to influence their child and the environment in ways that would foster the child's development and success" (Jones & Prinz, 2005, p. 342). In general, parents with more positive self-efficacy beliefs report that they find the parenting role rewarding and the problems associated with child rearing relatively easier to resolve. Positive PSE beliefs are associated with fewer parental depressive symptoms (Fotiadou, Cullen, & Barlow, 2004) and lower levels of stress (Streisand, Swift, Wickmark, Chen, & Holmes, 2005), as well as with more competent parenting practices (Coleman & Karraker, 1998) and better child adjustment (Coleman & Karraker, 2003). Although there are relatively less data available regarding the role of parental self-efficacy in hospital settings, it has been reported that parents with higher PSE experience relatively lower levels of negative mood after their children are admitted to a pediatric intensive care unit (Melnyk, 1995). Moreover, intervention programs increasing PSE of mothers of critically ill children have been shown to improve both parents' and children's psychological well-being and coping ability (Melnyk, Crean, Feinstein, Fairbanks, & Alpert-Gillis, 2007).

In light of the potential importance of PSE beliefs in hospital settings, it is crucial to further investigate the mechanisms by which self-efficacy beliefs may affect parent and child outcomes. A better understanding of such mechanisms would then allow us to more specifically target future intervention programs aiming to reduce parental anxiety (Jones & Prinz, 2005; Melnyk, 2000). From a social-cognitive perspective, it has been proposed that the effect of perceived self-efficacy on negative emotions may be mediated by maladaptive cognitive emotion regulatory processes (Bandura, 2001; Benight & Bandura, 2004). While emotion regulation has been defined as involving physiological, motivational, behavioral, and cognitive processes to regulate the experience and expression of emotion (Thompson, 1994), cognitive emotion regulation (CER) refers to the conscious cognitive component of this process (Garnefski, Kraaij, & Spinhoven, 2001; Ochsner & Gross, 2005). The concept of CER also partially overlaps with the concept of coping, with some authors suggesting that CER reflects a specific subset of coping responses (Eisenberg, Valiente, & Sulik, 2009; Garnefski et al., 2001).

Previous research within the coping literature found that cognitive strategies can either mediate (e.g., Barchia & Bussey, 2010; Kim, Jackson, Conrad, & Hunter, 2008) or moderate (e.g., Cox, Funasaki, Smith, & Mezulis, 2012; Troy, Wilhelm, Shallcross, & Mauss, 2010) the link between stressful life events and psychological well-being. Moreover, cognitive emotion regulatory processes can also play a role in parents' adjustment to their children's illness and hospitalization. Parents of ill or disabled children who

report higher levels of positive reappraisal (Barr, 2011; van der Veek, Kraaij, & Garnefski, 2009) and acceptance of the child's illness (Norizan & Shamsuddin, 2010), as well as lower levels of rumination (Goldbeck, 2001; van der Veek et al., 2009), catastrophic thinking (Caes, Vervoort, Eccleston, Vandenhende, & Goubert, 2011), and self-blame (Greening & Stoppelbein, 2007; van der Veek et al., 2009), also experience less anxiety and depression.

However, no research has yet investigated whether cognitive emotion regulatory processes in fact mediate or moderate the relationship between PSE beliefs and parents' anxiety in hospital settings. So far, the only initial indication of an association between PSE beliefs and cognitive emotion regulatory processes has been reported by Miklósi, Ribiczey, and Perczel Forintos (2011), who found that in a nonclinical sample of parents of 7–10-year-old children, parents who reported higher levels of self-efficacy also reported less catastrophizing and self-blame, and more acceptance and planning in response to their children's problem behaviors. An important step is now to investigate whether these cognitive processes play a role in the well-documented relationship between parental self-efficacy and anxiety in hospital settings.

The present study sought to examine these questions. We tested two competing models. First, according to the mediational model derived from social-cognitive theory, PSE beliefs might affect parents' anxiety levels by activating either adaptive or nonadaptive cognitive emotion regulatory processes. On the other hand, it is also logically possible that the association between PSE beliefs and anxiety is moderated, rather than mediated by cognitive regulatory processes. In other words, the effect of PSE beliefs on anxiety may depend on the extent to which parents use adaptive or nonadaptive cognitive emotion regulatory strategies in response to their child's hospitalization. We aimed to test these two competing models in a prospective design involving parents whose children underwent pediatric surgery.

Method

Participants

All parents whose children were admitted to the Heim Pál Pediatric Hospital for planned surgical intervention (Departments of Otolaryngology, Orthopedics, Surgery, and Urology) during a 3-week period of recruitment were approached to take part in the study. The inclusion criteria were the child's planned surgical intervention within 1 week, the parents being fluent Hungarian speakers, and the child being younger than 18 years old with no mental retardation. One hundred ninety-nine (96.6%) of 206

parent-child dyads fulfilling inclusion criteria agreed to participate in the study. Reasons for refusal included the parent being tired ($n = 4$) or not having enough time to participate in the study ($n = 3$). However, only 157 (78.9%) of the 199 questionnaire packets distributed to parents were returned. The children of the participating parents did not differ from children of nonparticipating parents (i.e., of those parents who did not consent to participate in the study or did not give back the questionnaire packet) in terms of age ($t(204) = -.254, p = .800$, Cohen's $d = -.036$) and gender ($\chi^2(1) = .165, p = .684, \phi = .028$).

On the day planned for the surgical intervention, 114 parents (57.3% of the total sample) were available to fill in the second questionnaire. Dropout was owing to postponed surgical intervention ($n = 23$), early discharge from hospital ($n = 8$), or the unavailability of parents on the day ($n = 12$). Sample characteristics are shown in Table I. No significant differences were found between children of parents who did and did not complete the follow-up assessment regarding the child's age ($t(155) = -.246, p = .806$, Cohen's $d = -.040$), gender ($\chi^2(1) = .097, p = .756, \phi = .025$), or parents' education ($\chi^2(2) = .330, p = .848$, Cramer's $V = .046$). Mean age of participating children was 7.02 years [standard deviation (SD) = 4.36, range: 6 months to 17 years].

Procedure

Ethical approval was obtained from the Institutional Ethical Committee of the Heim Pál Pediatric Hospital. Parents were contacted by the first author when arriving for their child's preoperative examination, from 1 to 7 day(s) before admission to the hospital. After being informed about the nature of the study and assured of anonymity and confidentiality, parents gave their written consent and completed the "Time 1" questionnaire packet. This included a demographic form, the Parental Belief Scale for Parents of Hospitalized Children (PBS), and the shortened Cognitive Emotion Regulation Questionnaire (CERQ-short). The Time-1 questionnaires took ~15 min to fill in, and were completed in the office of the head nurse, while waiting for the preoperative examination. On the day of the surgical intervention (Time 2), ~1–6 hr after intervention, parents were asked by the fourth author to complete the Spielberger State-Trait Anxiety Inventory State subscale (STAI-S). Parents took 5–10 min to complete this questionnaire and handed it back to the researcher. No compensation was provided for participation.

The procedures were carefully considered to reduce potentially biasing situational characteristics. For example, we assessed parents' anxiety after, rather than before, the child's surgery. This might have resulted in reduced levels

of parental anxiety because the separation from the child has already been terminated and concerns about the short-term outcome of the intervention have been reduced. Nevertheless, postsurgery anxiety was a highly relevant outcome measure, as parents now needed to manage their child's recovery and postoperative care. If both parents were present, we asked the parent who took primary responsibility for the child's postoperative care to complete the questionnaires. To ensure that parents were not distracted by their children during the data collection process, children were given toys and a research assistant played with the child while the parents completed the questionnaires.

Measures

Demographic Form

The parents reported their level of education and their child's gender and age. The relevant hospital department and length of stay were also recorded.

The PBS (Melnyk, 1994) assesses parents' beliefs about their ability to understand and predict their children's behavior and emotions (e.g., "I know what changes in behavior to expect in my hospitalized child") and about parenting their children during hospitalization (e.g., "I am clear about the things that I can do to best help my child"). Parents respond to the 20 items using a 5-point Likert-type scale (from 0 [*strongly disagree*] to 5 [*strongly agree*]). Higher scores indicate stronger PSE beliefs. In previous research, this measure showed excellent internal consistency with an alpha score of .91 (Melnyk et al., 2007). The Hungarian version of the PBS was developed for the purpose of the present study using a back-translation process. Psychometric properties were assessed in an independent sample of parents whose children were admitted to the Department of Surgery. It showed excellent internal consistency ($\alpha = .938$), acceptable stability, and a significant positive correlation with the Parental Sense of Competence Scale (Johnston & Mash, 1989), a well-established measure of PSE. In the present sample, internal consistency of the PBS was .935.

The STAI-S (Spielberger, Gorsuch, & Lushene, 1970) is the most widely used self-report measure of anxiety, and has been validated across genders and ethnic groups (Novy, Nelson, Goodwin, & Rowzee, 1993). We assessed state anxiety, which measures situational anxiety as a reaction to environmental cues (Spielberger et al., 1970). The STAI-S consists of 20 items with a Likert-type response format (from 0 [*almost never*] to 3 [*almost always*]). Higher scores represent higher levels of anxiety. Validity and reliability of the Hungarian version has been reported

Table 1. *Sample Characteristics (N = 114) of Participants Who Returned Both Time 1 and Time 2 Questionnaires*

Sample characteristics	N (%)
Department	
Otolaryngology <i>n</i> (%)	52 (45.6)
Orthopedics <i>n</i> (%)	12 (10.5)
Surgery <i>n</i> (%)	27 (23.7)
Urology <i>n</i> (%)	23 (20.2)
Length of hospital stay	
≤24 hr (day surgery) <i>n</i> (%)	81 (71.1)
>24 hr (minor/major interventions) <i>n</i> (%)	33 (28.9)
Mean age of children in years (SD)	7.02 (4.36)
Child's gender	
Girls <i>n</i> (%)	42 (36.8)
Boys <i>n</i> (%)	72 (63.2)
Participating caregiver	
Mothers <i>n</i> (%)	101 (88.6)
Fathers <i>n</i> (%)	13 (11.4)
Other (adopting mother) <i>n</i> (%)	1 (.9)
Caregiver's level of education	
Low level of education (≤8 years) <i>n</i> (%)	21 (18.4)
Medium level of education (12 years) <i>n</i> (%)	53 (46.5)
High level of education (high school or high or university degree) <i>n</i> (%)	40 (35.1)

Note. SD = standard deviation.

by Sipos and Sipos (1983). In this study, the STAI-S showed excellent internal consistency ($\alpha = .920$).

The CERQ-short (Garnefski & Kraaij, 2006a) is a self-report measure assessing nine cognitive strategies of emotion regulation. It has been developed from the original 36-item version of the CERQ (Garnefski et al., 2001) and consists of 18 items that participants respond to via a 5-point Likert-type scale (from 1 [*almost never*] to 5 [*almost always*]). Higher scores represent more frequent use of the specific CER strategy. Previous research found good factorial, convergent, and discriminant validity for both versions of the CERQ, as well as acceptably high reliabilities for the individual subscales (Garnefski et al., 2001; Garnefski & Kraaij, 2006a, 2006b; Geisler, Vennwald, Kubiak, & Weber, 2010). Validity and reliability of the Hungarian version has been reported by Miklósi, Martos, Kocsis-Bogár, and Perczel Forintos (2011).

The nine cognitive strategies assessed by the CERQ can be grouped into adaptive and nonadaptive strategies. Adaptive strategies include *acceptance* (“I think that I have to accept that this has happened”), *positive refocusing* (“I think of nicer things than what I have experienced”), *refocus on planning* (“I think of what I can do best”), *positive reappraisal* (“I think I can learn something from the situation”), and *putting into perspective* (“I think that it all could have been much worse”). Nonadaptive strategies include *self-blame* (“I feel that I am the one to blame for

it”), *rumination* (“I often think about how I feel about what I have experienced”), *catastrophizing* (“I continually think how horrible the situation has been”), and *blaming others* (“I feel that others are to blame for it”). In this study, we used the *adaptive strategies* (CERQ-A) and *nonadaptive strategies* (CERQ-NA) subscales. Scores for CERQ-A and CERQ-NA were derived by summing the relevant subscale scores described above. Internal consistency estimates for the CERQ-A and CERQ-NA were .759 and .779, respectively. The questionnaire was adapted to the aims of the study, following the guidelines of the authors (Garnefski, Kraaij, & Spinhoven, 2002): the instruction was slightly modified to direct parents' attention to issues related to the child's hospitalization (“Having a child hospitalized or treated for an illness can be a difficult experience for many parents. Parents have different thoughts about this situation. Please indicate how often you had each of the following thoughts concerning this situation”).

Results

Descriptive Statistics

Data were analyzed using IBM SPSS 20 (2011). Power analyses were undertaken using the software GPOWER (Faul & Erdfelder, 1992), to clarify if any lack of statistical significance would be due to low sample size. Missing values (1%) were imputed using multiple regression method.

Descriptive statistics for all variables are shown in Table II. About one quarter (24.6%) of parents had scores on the STAI-S that were 1 SD above the mean score of the adult Hungarian normative sample (Sipos & Sipos, 1983), and 4.4% of parents had scores that were ≥ 2 SDs above the mean. There were no significant differences in CERQ, PBS, and STAI-S scores between parents according to their level of education, their child's gender, or length of hospital stay. Pearson correlations among the variables are shown in Table II.

Test of Mediation Effects

To test the hypothesis that the use of adaptive and nonadaptive CER strategies mediates the effect of PSE beliefs on parents' anxiety, we used the multiple mediator approach (and the SPSS macro) provided by Preacher and Hayes (2008). This approach allowed us to assess the total, direct, and indirect effects (total and specific for each mediator) of PSE on parents' anxiety. Bootstrapping with a resample procedure of 5,000 bootstrap samples [bias corrected and accelerated (BCa) estimates and 95% confidence interval (CI)] was used for significance testing. The child's age, gender, and length of hospitalization, as well as the parents' levels of education (low/medium/high, choosing a low level of education as reference category), were included as covariates. Length of hospitalization was dummy coded: 0 = ≤ 24 hr, indicating day surgery, and 1 = > 24 hr, indicating minor or major surgery, as proposed by Welch, Randolph, Ravitch, O'Neill, and Rowe (1986).

Results of the mediational analysis ($R^2 = .160$, adjusted $R^2 = .096$, $F(8,105) = 2.500$, $p = .016$, Observed statistical power = .934) revealed that the total and direct effects of PSE on anxiety were $-.280$, $p = .005$ and $-.261$, $p = .007$, respectively, and the total indirect effect through the two mediators was $-.016$ (95% BCa bootstrap CI: $-.089$ to $.039$). An examination of the specific indirect effects also indicated that neither CERQ-A ($b = -.002$; 95% BCa bootstrap CI: $-.036$ to $.015$) nor CERQ-NA

($b = -.012$; 95% BCa bootstrap CI: $-.092$ to $.028$) was a significant mediator, controlling for all covariates in the model.

Test of Moderational Effects

To test the possible moderational effects of adaptive and nonadaptive CER on the relationship between PSE beliefs and state anxiety, a multiple hierarchical regression analysis was conducted using the STAI-S score as the dependent variable and the centered PBS, centered CERQ-A, and centered CERQ-NA scores and all possible two-way and the three-way interaction terms (predictors), again, controlling for background variables. In this analysis, a significant interaction effect of CER by PSE would suggest a moderational effect. Results of the regression analysis are summarized in Table III. Hospitalization and demographic characteristics had no significant effect on STAI-S scores. Main effects of PBS and CERQ-NA and the two-way interaction of PBS by CERQ-NA emerged as significant. CERQ-A did not have an effect on state anxiety.

A post hoc probing of significant interaction effects (Holmbeck, 2002) was performed. Post hoc analysis revealed that the unstandardized simple slope for individuals 1 SD below the mean of CERQ-NA was $-.002$ ($t = -3.944$, $p < .001$) and that the unstandardized simple slope for individuals 1 SD above the mean of CERQ-NA was $-.000098$ ($t = -.243$, $p = .808$). All other variables were included when we computed the constant for the predicted values. Therefore, the plots depicted in Figure 1 represent fully controlled relationships.

Discussion

The aim of the present study was to examine the effect of CER and parental self-efficacy on parents' anxiety after a child's planned surgery. To our knowledge, this was the first prospective study to assess the joint effect of multiple cognitive factors on parents' anxiety after a child's surgery. We aimed to enhance the generalizability of our findings by

Table II. Descriptive Statistics and Reliabilities and Zero-Order Correlations of Study Variables (n = 114)

Scale	Mean	SD	α	Pearson's correlation coefficients (95% CI)			
				2	3	4	Child's age
1. CERQ-A	30.49	6.39	.759	.011 (−.173 to .194)	.092 (−.093 to .271)	−.039 (−.221 to .145)	.037 (−.147 to .219)
2. CERQ-NA	15.04	4.45	.779	–	−.096 (−.275 to .089)	.234* (.053 to .400)	.030 (−.154 to .267)
3. PBS	67.26	9.65	.938	–	–	−.285** (.107 to .445)	.113 (.072 to .290)
4. STAI-S	21.67	9.93	.920	–	–	–	−.148 (−.323 to .036)

Note. CERQ-NA = Cognitive Emotion Regulation Questionnaire, short form, nonadaptive strategies subscale; CERQ-A = Cognitive Emotion Regulation Questionnaire, short form, adaptive strategies subscale; CI = confidence interval; PBS = Parental Belief Scale for Parents of Hospitalized Children; STAI-S = Spielberger State-Trait Anxiety Scale, State Subscale; SD = standard deviation.

* $p < .05$, ** $p < .01$.

Table III. Results of a Moderated Hierarchical Multiple Regression Analysis Predicting STAI-S Scores ($n = 114$)

Dependent: STAI-S	β	SE of β	95% CI of β	t	p	Power ($\alpha = .05$)	ΔR^2
Step 1							.059
Child's gender (0 = boys, 1 = girls)	-.029	.097	-.222 to .163	-.303	.763	.060	
Length of hospital stays (0 = ≤ 24 hr, 1 = > 24 hr)	.052	.098	-.142 to .245	.528	.599	.082	
Mother's level of education (0 = low, 1 = medium)	-.103	.132	-.365 to .159	-.781	.437	.121	
Mother's level of education (0 = low, 1 = high)	-.207	.133	-.470 to .056	-1.558	.122	.339	
Child's age	-.124	.100	-.322 to .073	-1.246	.215	.235	
Step 2							.101
CERQ-A	-.031	.090	-.210 to .148	-.347	.730	.064	
CERQ-NA	.187	.092	.005 to .368	2.035	.044	.523	
PBS	-.253	.093	-.436 to -.069	-2.724	.008	.770	
Step 3							.061
CERQ-A*CERQ-NA	.004	.096	.187 to .195	.041	.967	.050	
CERQ-A*PBS	-.071	.095	-.260 to .118	-.744	.459	.114	
CERQ-NA*PBS	.257	.093	.072 to .441	2.765	.007	.782	
Step 4							.005
CERQ-A*CERQ-NA*PBS	.094	.114	-.132 to .320	.824	.412	.129	

Note. Because of the significance of Kolmogorov-Smirnov test ($p < .05$), STAI-S scores were transformed using the Box-Cox method to assure normality.

$R^2 = .226$; adjusted $R^2 = .134$; $F(12,100) = 2.445$ $p = .008$; observed statistical power = .977 for the final model; STAI-S = Spielberger State-Trait Anxiety Scale, State Subscale; PBS = Parental Beliefs Scale for Parents of Hospitalized Children; CERQ-A = Cognitive Emotion Regulation Questionnaire, short form, adaptive strategies subscale; CERQ-NA = Cognitive Emotion Regulation Questionnaire, short form, nonadaptive strategies subscale.

attempting to recruit all parents whose children were admitted for planned surgical intervention during the 3-week period of data collection and including parents of children from multiple diagnostic and age groups.

First, our regression analyses showed that when all other variables were entered into the equation, higher PSE was significantly associated with lower anxiety. These results add to a growing literature showing the importance of PSE beliefs in determining parents' anxiety in pediatric hospital settings (e.g., Melnyk, 1995; Melnyk et al., 2007), and extend previous findings by statistically controlling for other important constructs. The results are consistent with social-cognitive theory (Bandura, 2001), which postulates that self-efficacy beliefs can facilitate adaptation to stressful events.

Second, greater use of nonadaptive CER strategies (i.e., catastrophizing, rumination, or self-blame) was found to be related to more anxiety, when all other variables were statistically controlled for. Again, this relationship has been found consistently in the previous literature (e.g., Garnefski & Kraaij, 2006b), and has been extended to pediatric hospital settings by our study. However, the use of adaptive CER strategies (involving acceptance, refocus on problem solving, or positive reappraisal) did not predict negative emotion. This finding might indicate the relatively more important role of negative thinking in response to stress in determining anxiety. Alternatively, the results may have been due to the heterogeneity of CER strategies considered to be adaptive. While previous

evidence supported the adaptive value of positive reappraisal, findings are inconsistent regarding the other cognitive strategies currently included in the CERQ-A subscale (Jermann, Van Der Linden, D'Acromont, & Zermatten, 2006; van der Veek et al., 2009). Further research is needed to explore the effect of these strategies on negative emotions.

The main aim of the study was to explore the potential role of CER in the association between PSE beliefs and anxiety. Both mediational and moderational models were tested. Multiple mediation analysis did not support the hypothesis that CER mediates the effect of PSE beliefs on parents' anxiety. In other words, it is possible that adaptive or nonadaptive CER strategies are relatively stable characteristics of parents' responses to stress, rather than these strategies being triggered by the presence of low or high parental self-efficacy beliefs. On the other hand, we found a significant interaction effect between nonadaptive CER and PSE beliefs on parents' anxiety, suggesting that the association between self-efficacy beliefs and anxiety is significantly different across levels of use of nonadaptive CER strategies (moderator). The simple slope for the low nonadaptive CER regression line was significant, indicating that parents' anxiety tend to be lower at higher levels of PSE when nonadaptive CER is also low. However, no significant relationship was found between PSE beliefs and state anxiety when there were high levels of use of nonadaptive CER strategies. In other words, parents who excessively use such strategies as rumination,

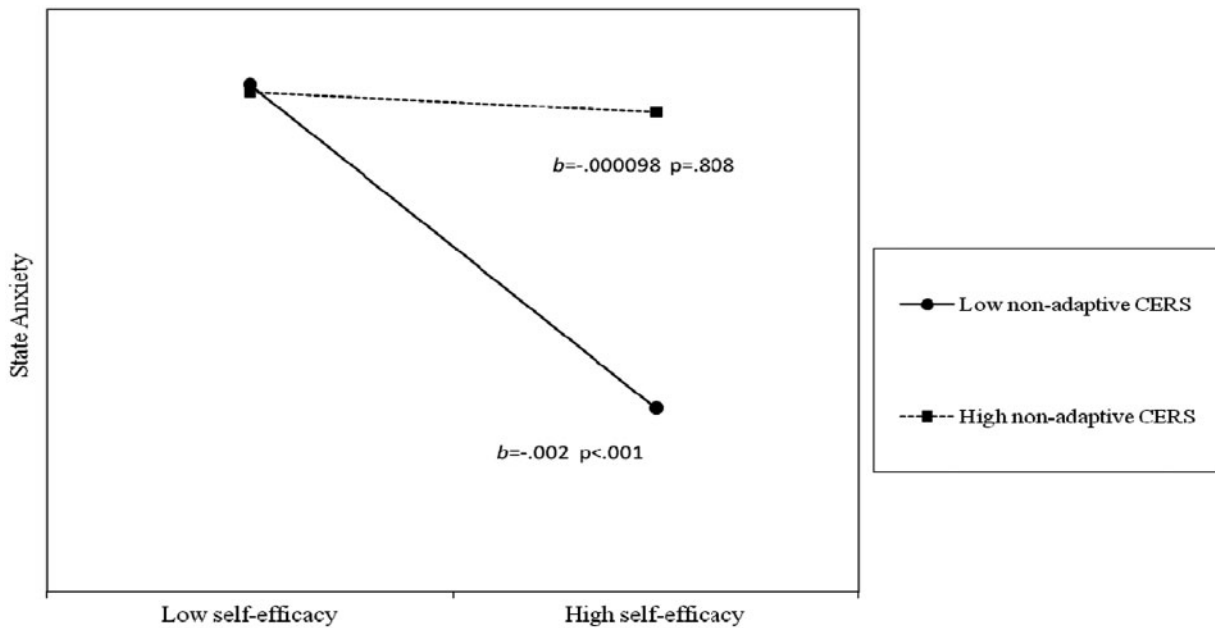


Figure 1. Regression lines for relations between perceived parental efficacy and state anxiety as moderated by the use of nonadaptive cognitive emotion regulation strategies (a two-way interaction). b = unstandardized regression coefficient (i.e., simple slope); CERS = Cognitive Emotion Regulation Strategies. 219 × 122 mm (200 × 200 DPI).

catastrophizing, or self-blame in response to their child's illness also experience higher levels of anxiety, independent of their level of PSE.

Taken together, our findings suggest that interventions targeting PSE beliefs alone might prevent or reduce parental anxiety in some instances, but that targeting parents' CER strategies would also be important in helping them cope with a child's surgery. Identifying a subgroup of parents who are characterized by excessive use of nonadaptive CER strategies may be an especially helpful approach. In this group, interventions aiming to enhance PSE beliefs alone might be relatively less effective; targeting these parents' CER strategies is likely to greatly enhance treatment success.

Limitations and Suggestions for Further Research

While our results have important theoretical and clinical implications, these need to be considered in light of the study's limitations. Importantly, we used self-report measures to assess both cognitive predictors and emotional outcome. Self-reports can be biased by contextual factors, memory, and social desirability. Further, single source reporting could inflate the relationships among the variables. However, as the relationships were not uniformly high (e.g., there was no association between adaptive CER and anxiety), such biases are unlikely to have played

a significant role. While we believe that self-report measures are the most appropriate assessments when enquiring about individuals' internal experience, future research should now complement the present data by using multimethod assessments (e.g., behavioral observation or physiological indicators of anxiety) as well.

Other limitations concern the generalizability and clinical significance of our findings. Similar to other research on parenting (e.g., Coleman, & Karraker, 2003; Greening, & Stoppelbein, 2007; Melnyk et al. 2007; Norizan, & Shamsuddin, 2010), female caregivers were overrepresented in the present sample. This overrepresentation indicates the fact that females still tend to be the primary day-to-day caregivers of children. Therefore, a better understanding of their responses to the child's hospitalization is especially important. Nevertheless, it needs to be acknowledged that the oversampling of female caregivers may limit the generalizability of our findings. Fathers may respond to children's illness differently, and such responses also need to be considered in future research and intervention programs. It is also important to point out that in our sample state anxiety scores were within normal limits for most of the parents. This can be explained by the high percentage (>70%) of the children who underwent day surgery, a relatively low-stress situation. To extend the generalizability of our findings and their clinical relevance, future studies are now

needed to examine the role of parental self-efficacy and emotion regulation in the context of more serious medical procedures as well.

Future studies may also improve on the design and statistical analyses used in our current research. Although our design was prospective, we did not collect data on state anxiety at Time 1, which means that an earlier wave of data for this variable could not be controlled. In addition, paths in the mediational model were not prospective, making it impossible to determine the temporal ordering of our variables. Moreover, we had only two waves of data for tests of mediation; three waves would have allowed us to more carefully examine the temporal relations among our variables. More careful large-scale longitudinal designs may be able to uncover further important relationships among the constructs we began to investigate in the present study.

While further work is needed to gain a more complete understanding of the cognitive underpinnings of parents' anxiety after a child's surgery, our findings on the moderating role of CER underline an important aspect of these experiences. Moreover, they draw researchers' attention to the need to test more complex models of cognitive factors that may be crucial in parents' stress reactions to their children's hospitalization and medical events.

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