

DOCUMENT RESUME

ED 308 949

PS 018 125

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 TITLE Cognitive, Temperamental, and Family Characteristics as Predictors of Children's Adjustment to Surgery.
 PUB DATE Apr 89
 NOTE 14p.; Paper presented at the Biennial Meeting of the Society for Research in Child Development (Kansas City, MO, April 27-30, 1989).
 PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)
 EDRS PRICE MF01/PC01 Plus Postage.
 DESCRIPTORS *Adjustment (to Environment); *Children; *Cognitive Development; Comprehension; *Family Characteristics; Hospitalized Children; *Personality; Predictor Variables; *Surgery
 IDENTIFIERS *Tonsillectomies

ABSTRACT

Findings from a study of 47 children between 3.5 and 12 years of age who received tonsillectomies at a children's hospital are presented. During a home visit before hospitalization, the child's adjustment, cognition, temperament, and family characteristics were assessed. Tonsillectomies were followed by an overnight stay at the hospital, and behavioral ratings were made during that period. One to two weeks after the child returned home, the mother again completed measures of the child's adjustment. Findings indicated that adjustment prior to hospitalization was the strongest predictor of post-surgical adjustment. However, cognitive, temperamental, and family factors were also significant predictors. Children's conceptualizations of illness and medical procedures were strongly related to general cognitive development, and more sophisticated illness conceptualizations were associated with better adjustment after surgery. Children who displayed the most positive reactions to hospitalization were temperamentally more rhythmical, i.e., had predictable, regular behavior, and tended to be more approaching to new experiences. They were also more adaptable, more positive in mood, more distractible, and had lower thresholds of responsiveness. Measures of family characteristics were less strongly associated with children's reactions to hospitalization. However, maternal anxiety, overprotection, and overindulgence were predictive of poorer adjustment. (Author)

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Presented at the biennial meeting of the Society for Research in
Child Development, Kansas City, 1989

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PS 018125

Abstract

This paper presents findings from a study of 47 children aged 3 1/2 - 12 years old who received tonsillectomies at a Children's Hospital. During a home visit before hospitalization, the child's adjustment, cognitive variables, temperament, and family characteristics were assessed. Tonsillectomies were followed by an overnight stay at the hospital, and behavioral ratings were made during that period. One to two weeks after the child returned home, the mother again completed measures of the child's adjustment.

Results indicated that adjustment prior to hospitalization was the strongest predictor of post-surgical adjustment. However, cognitive, temperamental and family factors were also significant predictors. Children's conceptualizations of illness and medical procedures were strongly related to general cognitive development, and more sophisticated illness conceptualizations were associated with better adjustment after surgery. Children who displayed the most positive reactions to hospitalization were temperamentally more rhythmical (i.e., had predictable, regular behavior), and tended to be more approaching to new experiences. They were also more adaptable, more positive in mood, more distractible, and had lower thresholds of responsiveness. Measures of family characteristics were less strongly associated with children's reactions to hospitalization. However, maternal anxiety, overprotection, and overindulgence were predictive of poorer adjustment.

Cognitive, Temperamental, and Family Characteristics
as Predictors of Children's Adjustment to Surgery
David K. Carson, James R. Council, and Jill E. Gravley

This study had the following aims: 1.) To examine cognitive development as a determinant of a child's ability to comprehend illness and the purpose of medical procedures, and to investigate these variables as predictors of adjustment to hospitalization. 2.) To examine the influence of various temperament characteristics on children's responses to the stress of hospitalization. 3.) To investigate effects of the family environment on children's responses to hospitalization and surgery. We predicted that family cohesion and adaptability, as well as the quality of the mother-child relationship, would influence a child's experience of hospitalization.

Method

Forty-seven children (30 female, 17 male) aged 3 1/2 to 12 years old who were scheduled to receive tonsillectomies at a Children's Hospital were studied. Virtually the entire sample consisted of Caucasian children from intact, middle to upper-middle class families.

During a home visit prior to surgery, a child's level of cognitive development, conceptions of illness causality, and general verbal ability were assessed. Mothers completed prehospitalization measures of background/demographics, family variables (including the mother-child relationship), their child's

temperament and adjustment, and their own anxiety.

Tonsillectomies were followed by an overnight stay at the hospital. After a period of observation, Child Life staff rated each child on a scale that included measures of compliance and distress during hospital activities, postoperative pain behavior, physical symptoms, and interpersonal behavior. One to two weeks after children returned home, mothers completed and returned a post-hospitalization adjustment questionnaire.

Measures

Cognitive Measures. The Peabody Picture Vocabulary Test -- Revised (PPVTR; Dunn & Dunn, 1987) was used as a general measure of intelligence. This test of receptive vocabulary required a child to point to pictures that corresponded to words read by the examiner.

The Concept Assessment Kit (CAK; Goldschmid & Bentler, 1968) was used to determine a child's level of cognitive development (according to Piaget's theory) through performance on several conservation tasks. The CAK was used to assess children up to 8 years old. Older children of normal intelligence (estimated by the PPVT) were credited with perfect scores on this measure.

Conceptualizations of Illness Causality were measured with six questions developed by Perrin & Gerrity (1981): 1.) How do children get sick?; 2.) How can children keep from getting sick?; 3.) Some children get stomachaches when they are sick. How do kids get stomachaches?; 4.) Sometimes when children get sick they have to stay in a hospital. What would be wrong with them that would make them have to stay in a hospital?; 5.) When children are sick, how

can they get better again?; 6.) Sometimes when children get sick they have to take medicine. How does medicine work?

These questions were read to children and their responses recorded verbatim. Responses received a score from 0 to 6 according to explicit criteria, with higher scores indicating more sophisticated illness concepts. For example, a score of "5" indicated that a child was beginning to use underlying principles or causal agents in explaining illnesses.

Measures of Temperament. The Behavioral Style Questionnaire (BSQ; McDevitt & Carey, 1975) and the Middle Childhood Temperament Questionnaire (MCTQ; Hegvik, McDevitt & Carey, 1980) were used with 3-to-7 and 8-to-12 year olds, respectively. They assessed nine dimensions of childhood temperament: activity level, rhythmicity, approach-withdrawal, adaptability, intensity of reaction, threshold of responsiveness, quality of mood, distractibility, and attention span/persistence. Items were behavioral descriptions that were rated for their similarity to a child's behavior on 6-point scales.

Measures of Adjustment. The Post-Hospitalization Adjustment Questionnaire (PHAQ; Vernon & Schulman, 1964) was used to assess twenty-seven behavioral symptoms frequently reported to affect children after hospitalization. Although six subscale scores can be derived from the questionnaire, total scores are used here in order to simplify the presentation of results. This measure was completed by mothers both before and after their child's hospitalization.

The Pediatric Patient Rating Scale (Council & Carson, 1989) was a 22-item behavior rating scale that was completed by Child Life staff after several hours of general contact with the patient. The

items assessed distress and cooperation during various hospital procedures and social interactions experienced by the patient. Item analysis with an independent sample of 28 hospitalized children resulted in a final scale composed of the 12 items highest in inter-rater reliability. Higher scores on this measure indicate more positive adjustment.

Family and parent measures. The State-Trait Anxiety Inventory (STAI; Spielberger, 1970) was used to assess mothers' levels of generalized and specific anxiety.

The Family Adaptability and Cohesion Evaluation Scale III (FACES-III; Olson, Portner, & Lavee, 1985) was used to assess the general quality and supportiveness of family environment. This measure yielded scores indicating adaptability and cohesiveness, as well as a composite "distance from center" score based on Olson's Circumplex Model.

The Mother-Child Relationship Evaluation (MCRE; Roth, 1980) was used to assess the quality of the mother-child relationship. It yielded scores indicating maternal acceptance, overprotection, overindulgence, and rejection.

Results

A dependent t-test was conducted on pre- and post-hospitalization PHAQ scores to determine the effect of hospitalization on adjustment. The difference between means was not significant ($t = .91$). Two stepwise regression analyses were conducted in which behavior in the hospital (PPRS) and post-hospitalization adjustment (PHAQ), respectively, were the dependent variables. Remaining variables assessed in this study were entered

into the regressions in order to determine their predictive power. Results for the PPRS indicated that Approach was the most powerful predictor with a standardized regression coefficient of $-.72$ ($t=-4.25$, $p<.001$). The PPVT was the only other significant predictor, with a standardized regression coefficient of $-.36$ ($t=-2.13$, $p<.05$). The Multiple R was $.70$, accounting for 49% of variance in the PPRS scores. Results for the PHAQ indicated that the pre-hospitalization score on the same measure was by far the most powerful predictor with a standardized regression coefficient of 1.03 ($t=12.87$, $p<.001$). The other significant predictors were mother's State Anxiety prior to hospitalization, and Mood, with standardized regression coefficients of $-.24$ ($t=-3.53$, $p<.01$) and $.21$ ($t=2.69$, $p<.05$), respectively. The Multiple R was $.97$, accounting for 94% of the variance in the PHAQ scores.

Table 1 indicates relationships between cognitive variables and adjustment. First of all, these data suggest that concept development specific to illness causality is related to more general indicators of cognitive development, including age. The data also indicate that illness concepts are more consistently predictive of hospitalization-related behaviors than the more general cognitive variables.

Table 2 presents findings on the relationship between temperament variables and responses to hospitalization. The results indicate that several aspects of childhood temperament may affect a child's reactions to hospitalization. Children who displayed the most positive reactions to hospitalization were temperamentally more rhythmical (i.e., had predictable, regular behavior), and tended to be more approaching to new experiences.

They were also more adaptable, more positive in mood, more distractible, and had lower thresholds of responsiveness.

Table 3 presents correlations between family variables and indicators of adjustment to hospitalization. These data suggest that mothers' anxiety and factors in the mother-child relationship relating to overprotection and overindulgence may also influence post-surgical adjustment. Variables assessed by FACES-III were unrelated to reactions to hospitalization.

Conclusions

This study was conducted to examine cognitive development, temperament, and family characteristics as moderators of children's adjustment to hospitalization and surgery.

The results suggest that specific variables from each category were predictive of adjustment reactions to the hospital experience. In particular, children's conceptions of illness and medical procedures, several temperamental factors, and the mother-child relationship appeared to significantly influence children's reactions to hospitalization.

It should be noted here that this study employed a correlational design. The results should encourage investigators to employ these classes of variables in experimental research, for example, investigations of interventions designed to prepare children for stressful medical procedures.

A problematic aspect of the study concerns the failure to find a significant difference between the pre- and post-hospitalization measures of adjustment. This result could imply either that children do not experience adjustment difficulties as a result of

hospitalization, or that they were evidencing difficulties as a result of anxiety or other responses in anticipation of hospitalization. Follow-up PHAQ data are currently being collected to determine whether the pre-hospitalization measure was actually representative of baseline adjustment.

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Table 1. Correlations Involving Cognitive Development and Adjustment

	ILLCON	CAK	PPVT	Age	PPRS	PHAQ:	
						Pre	Post
Illness Concepts (ILLCON)	--	.64***	.58***	.63***	.37*	-.47***	-.21
Conservation (Concept Assessment Kit; CAK)		--	.46**	.77***	.12	-.30	-.17
Receptive Vocabulary (PPVT)			--	.34*	.04	-.29	.03
Age				--	.28	-.32*	-.23
Pediatric Patient Rating Scale (PPRS)					--	-.62***	-.52**
Pre-Hospitalization Adjustment (PHAQ: Pre)						--	.83***
Post-Hospitalization Adjustment (PHAQ: Post)							--

Note: n = 43 to 47, except in the case of PPRS, where n = 33.

*** p < .001 ** p < .01 * p < .05

Table 2. Correlations Between Temperament and Response to Hospitalization

	PPRS	PHAQ	
		Pre	Post
Activity	-.26	.22	.15
Rhythmicity	-.43**	.66***	.54***
Approach	-.54***	.60***	.51***
Adaptability	-.42*	.67***	.64***
Intensity	.26	.11	.23
Mood	-.46**	.60***	.65***
Persistence	-.15	.32*	.30
Distractibility	.60***	-.24	-.12
Threshold	.50**	-.47**	-.29

*** p < .001 ** p < .01 * p < .05

Table 3. Correlations Between Family Variables and Response to Hospitalization

	PPRS	PHAQ	
		Pre	Post
FACES:			
Cohesion	.00	-.19	.01
Adaptability	.14	-.11	.06
Centrality	.10	.11	-.03
MCRI:			
Acceptance	.23	-.09	-.18
Overprotection	-.17	.41**	.43**
Overindulgence	-.16	.30**	.45**
Rejection	-.29	.36*	.36*
STAI: Mother			
State	-.22	.34*	.13
Trait	-.37*	.50***	.47**

*** p < .001 ** p < .01 * p < .05