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Contents

Preface

This is the twelfth volume of the *Annual Review of Nursing Research* (*ARNR*) series, which began in 1983. As introduced in Volume 11, the beginning of the book's second decade, our goal is to select chapter topics that are more specific in focus.

Part I, Research on Nursing Practice, follows the theme of significant clinical issues. In Chapter 1, Nancy M. Ryan-Wenger presents research on psychogenic pain in children. Chapter 2 includes a discussion of fatigue during the childbearing period by Renée A. Milligan and Linda C. Pugh. Terry Fulmer reviews the research on elder mistreatment in Chapter 3, and Clarann Weinert and Mary E. Burman review research on rural health and health-seeking behaviors in Chapter 4.

Research on Nursing Care Delivery is the focus of Part II. In Chapter 5, Sandra R. Edwardson and Phyllis B. Giovannetti review research on nursing workload measurement systems. A review of hospice nursing as symptom control is presented by Inge B. Corless. Part III, which focuses on Nursing Education Research, includes one chapter, a review of registered nurses and the baccalaureate degree by Mary Beth Mathews and Lucille L. Travis. Part IV, Research on the Profession of Nursing, also includes one chapter, a review of research on minorities in nursing by Diana L. Morris and May L. Wykle.

Part V has served as a category for chapters that do not easily fit the content theme of Part I or the categories included in the other components. Part V also has included chapters regarding nursing research in other countries. In this twelfth volume, Part V includes a chapter on Native American health by Sharol F. Jacobson and a chapter on nursing research in Korea by Elizabeth C. Choi.

Our thanks are extended to the new Advisory Board members who joined us as of Volume 11: Violet Barkauskas, Marie Cowan, Claire Fagin, Suzanne Feetham, Phyllis Giovannetti, Ada Sue Hinshaw, Kathleen McCormick, Jane Norbeck, Christine Tanner, Roma Lee Taunton, and Harriet Werley. Our Ad-

visory Board members play a major role in setting directions for the future, as well as recommending authors, chapters, and reviewers for each volume.

We look forward to your continuing involvement in this important series. We continue to welcome suggestions for topics, authors, and expert reviewers, as well as your suggestions about how we can improve this *ARNR* series. Please let us know your ideas.

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FORTHCOMING

ANNUAL REVIEW OF
NURSING RESEARCH, Volume 13

Tentative Contents

PART I

Research on Nursing Practice

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Chapter 1

Psychogenic Pain in Children

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CONTENTS

The literature generally differentiates psychogenic pain from malingering, organic pain, and dysfunctional pain. *Malingering* (e.g., feigned abdominal pain) is rarely observed during childhood (Li, 1987). Some abdominal pain is labelled *organic* if the pain originates from and is manifested as a disease or disorder in a specific body organ or site, such as ulcerative colitis (Coleman, 1992). In the case of organic pain, there is a specific medical or surgical diagnosis. Pain is labelled *dysfunctional* when it is caused by normal variations in physiological processes (e.g., stool retention). Psychogenic pain, such as recurrent abdominal pain, is often labelled as such when pain is periodic in nature, the child is otherwise healthy in appearance, no specific medical or surgical diagnosis or dysfunction is apparent, and a "psychological" origin is suspected. The most popular (but relatively untested) theory is that psychogenic pain originates from a primary psychologic response to endogenous or exogenous stressors. A secondary physiologic stress response is manifested as pain at a variety of organ sites (Coleman, 1992). The theory does not specify the exact biological mechanism that elicits pain, however. Several terms are used to describe the same phenomenon, including psychogenic, psychosomatic, functional, recurrent, periodic, and nonspecific. For consistency, the term "psychogenic" is used in this review. Four sites of psychogenic pain in children are commonly referred to in the literature: abdominal pain, limb pain, headache, and chest pain.

DEFINITION OF TERMS

Abdominal Pain

Most clinicians and researchers have used Apley and Naish's (1958) original criteria for the diagnosis of psychogenic recurrent abdominal pain (RAP): pains at least once per month for 3 consecutive months, severe enough to limit activities, and intermittent asymptomatic periods. Pain is typically periumbilical, and concomitant autonomic symptoms such as nausea, perspiration, palpitations, and flushing or pallor are common. RAP occurs in 10% to 15% of all children, primarily during the school-age period, and more often in girls than boys (Li, 1987; Poole, 1984).

Limb Pain

Limb pains often have been erroneously referred to as "growing pains" because they tend to disappear when the child stops growing; however, the pains are not related to the growth process. Limb pain presents as deep, intermittent pain in the muscles of both calves or thighs (Szer, 1989), and is not associated with limping or limited mobility (Peterson, 1986). Naish and Apley (1951) devel-

oped criteria for psychogenic limb pain which included: a three-month history of pain, intermittent symptom-free intervals, occurs late in the day or awakens the child at night, and is severe enough to limit activity. Limb pain occurs in about 4.2% (Szer, 1989) to 15% (Schechter, 1984) of all children, primarily during the school-age period, and in girls more often than boys (Peterson, 1986).

Headache

Muscle contraction headaches of psychogenic origin typically occur daily and build in intensity during the day. The pain has been described as an ache or simply as something that "hurts," usually in the frontal area (Barlow, 1984). There has been much disagreement about the prevalence of psychogenic headaches in children, ranging from 5% to 20% of children (Barlow, 1984; Chu & Shinnar, 1992; Gascon, 1984; Passchier & Orlebeke, 1985; Schechter, 1984). There also has been disagreement about the percentage of headaches that are psychogenic in origin. Psychogenic headaches have been noted more often in adolescents than in younger children, and more often in girls than boys (Choquet & Menke, 1987; Sillanpää, 1983a, 1983b).

Chest Pain

Recurrent chest pain has not been well described in terms of specific location, intensity, or frequency, but has been reported to account for 650,000 physician visits annually in 10- to 21-year-olds (Coleman, 1984). In a study of urban black adolescents, chest pain was the seventh most common presenting symptom (Brunswick, Boyle, & Tarica, 1979). Chest pain has been reported in adolescents more often than younger children (Coleman, 1984), and in boys more often than girls (Selbst, 1985).

ORGANIZATION OF THE REVIEW

A critical analysis and overview of the corpus of published research on psychogenic pain in children is provided, followed by a synthesis of the research on 12 major variables related to psychogenic pain. When available, a description of the stated or implied underlying theoretical framework or hypotheses precedes the discussion of empirical work on each variable. Findings for which there is consensus, disparity, and/or equivocation are presented. Each subsection ends with a critical review of related intervention research and suggestions for further research.

The literature for this review was obtained from computerized literature searches, hand searches from medical, nursing, and social science indexes, and

references from published research. The empirical work included in this review was limited to all data-based research on the four common types of psychogenic pain in children, published from January 1980 to September 1992 ($N = 66$).

OVERVIEW OF THE RESEARCH

Research on psychogenic pain in children was conducted by scientists from numerous disciplines, including medicine (32), psychiatry (14), psychology (13), nursing (1), and other health-related disciplines (6). The scientists from behavioral science disciplines focus mainly on psychogenic or environmental and familial factors, whereas behavioral scientists focus primarily on physical or organic mechanisms to explain the pain. Studies have been conducted in numerous geographic areas including the United States (27), Western Europe (15), Great Britain (11), Canada (9), and Australia (4); it is apparent that psychogenic pain in children is a concern for children in most First World countries.

Samples of children with psychogenic pain were derived primarily from outpatient clinics and pediatrician offices (45), but also from schools or community groups (13), hospitals (5), and the emergency department (1). The source of subjects was not clearly stated in two studies. There is some argument about the equivalence of samples drawn from schools, clinics, and hospitals. The characteristics of school children with psychogenic symptoms who are *not* seen in the health care system may be different from children whose parents seek medical intervention for them through clinics, and may differ also from children whose parents are not satisfied with a psychogenic diagnosis even after hospitalization or unnecessary surgery (Hughes, 1984). Disparate results among these studies did not appear to be a function of the type of sample used thus it was possible to integrate the findings from all the studies.

Regarding research design, of the 66 studies, 61% (40) were comparative studies and 39% (26) were single-sample designs, 15 of which were descriptive studies, and 11 of which were studies of treatment interventions. Only one of the intervention studies was not controlled; half the studies employed an experimental and control-group design, whereas in the other half of the studies, subjects served as their own controls.

Of the 40 comparative studies, children with psychogenic pain were compared with both healthy and "sick" children (17), with healthy children only (10), or with "sick" children only (13). Sick children included those who had organic illnesses with symptoms similar to the psychogenic symptoms (22), chronic illnesses (8), unrelated acute illnesses (3), behavioral disorders (6) and psychiatric illnesses (1). One researcher compared children with adults. The

rationale for selection of these comparative groups was rarely given; therefore the utility of the findings for practice is unclear. Samples of healthy or asymptomatic children in the comparative studies were obtained from schools or the community (16), from children seen for routine well-child physical examinations in clinics (9) and from previously published literature (2).

All the investigators used convenience samples and subjects were sometimes deliberately selected because of specific characteristics. None of the research reports included a power analysis or rationale for the sample size selected. Although the number of subjects in single sample descriptive studies ranged from 16 to 2,921, over half the studies had more than 100 subjects. The intervention studies had from 1 to 106 subjects per group, whereas the comparative descriptive studies had from 1 to 539 subjects per group. Cohen's (1977) sample size guidelines were applied to the 51 comparative and intervention studies, with alpha set at 0.05 and power at 0.80. If a moderate effect size was predicted, only five studies would have had a sufficient sample size. If a large effect size was predicted, 26 studies would have had a sufficient sample size; however, a large effect size may not be justifiable.

Psychometrically sound instruments appropriate for children were used in the majority of studies, and appropriate statistical procedures were used to analyze the data. Most of the findings were based primarily on descriptive statistics, nonparametric, and simple inferential statistics such as t-tests and analysis of variance, and only a few authors identified an alpha level of significance a priori. Despite the inevitable limitations of individual studies, similarities among the findings suggested that the phenomenon observed was fairly robust; therefore, some conclusions can be drawn from a group of studies. To avoid the use of numerous *p*-values in the discussion of specific studies, the term "significant" is used throughout this review to reflect findings with *p*-values at 0.05 or better.

In general, there were two positions taken by investigators of psychogenic pain in children. Those who supported the notion of psychogenic origin of pain primarily studied family, environmental, and psychosocial variables, whereas nonsupporters (i.e., those who supported some biologic cause) primarily studied biophysical variables as alternative etiologies for the pain.

INCIDENCE AND IMPACT OF PSYCHOGENIC PAIN IN CHILDREN

An estimated 10% to 15% of all children experience psychogenic headache, abdominal, chest, or limb pain (Apley, 1975; Poole, 1984). The actual incidence and prevalence of psychogenic pain in children is not known because inconsistent criteria have been used for the term "psychogenic," however. Some

researchers relied on physician diagnoses, whereas other researchers included any child with parent-, teacher- or self-report of frequent pain symptoms. Further, the operationalization of the term "frequent" has varied from two episodes per week to one or more episodes per year. Many researchers did not require physician verification of psychogenicity based on the wide belief that only 5% of children with such pain symptoms have a medical or surgical diagnosis (Jay & Tomasi, 1981; Li, 1987; Poole, 1984).

The morbidity of psychogenic pain in children was reflected in school absenteeism, frequent and expensive physician visits, and poor long-term prognoses. Children with psychogenic symptoms missed more school days than asymptomatic children (Crossley, 1982; Hodges, Kline, Barbero, & Woodruff, 1985b; Robinson, Alverez, & Dodge, 1989; Wasserman, Whitington, & Rivara, 1988), as many as 26 to 30 days per school year (Bury, 1987; Hodges et al., 1985). Stomachaches and headaches accounted for 25% (Nader & Brink, 1981) and 41% (Stephenson, 1983) of all visits to the offices of school nurses in two different elementary schools. In a self-initiated school health clinic, 15% of the children made over half of all the visits with a variety of complaints, the most common of which were stomach aches and headaches (Lewis, Lewis, Lorrimer, & Palmer, 1977).

Over a 6–year period, 17.3% of the children's services provided by a health maintenance organization were for psychogenic symptoms (Starfield et al., 1980) and more than 20% of those children had at least eight additional acute and nonacute problems (Starfield et al., 1984). Complaints of abdominal pain accounted for 3% (n = 371) of all emergency department visits during 4 seasonally diverse months (Reynolds & Jaffe, 1990). Based on urine and hematologic laboratory results, chest x-rays, barium enemas, careful histories, and physical examinations, 64.4% were classified as medical diagnoses, 6.5% as surgical diagnoses, and 29.1% as "nonspecific" or psychogenic. From a sample of all 6–year old children in a new industrial town in Great Britain (n = 494), 34% experienced more than three episodes of abdominal pain within the past 3 months, according to parent report. Although 58% of those children had been seen by a general practitioner, no specific diagnosis or treatment was offered and parents reported the physician visit as "unhelpful" (Faull & Nicol, 1986). The cost of a typical 3–day outpatient and inpatient medical evaluation of a child with RAP was estimated to be $3060 per child in 1986 (Li, 1987). Such costs are disproportional to the percentage of children (about 5%) for whom a specific medical or surgical diagnosis for frequent headache, abdominal, chest or limb pain typically is found.

Stress research has shown that exaggerated and prolonged somatic responses to stress may result in structural changes and tissue damage (Eaton, Peterson, & Davies, 1981; Henker, 1984). This prolonged response may be responsible for the fact that children do not necessarily "grow out" of these

symptoms. Longitudinal and retrospective studies have shown that RAP is still present in 64% of a sample of children after 3 months (Crossley, 1982), in 68% after an average of 9 months (Wasserman et al., 1988), and 66% after 1 to 7 years (Bury, 1987). About one-fourth of school-age children who originally had RAP reportedly developed *other* pains several years later (Crossley, 1982; Magni, Pierri, & Donzelli, 1987). After 12 years, one-half of the most frequent visitors to the self-initiated school clinic still complained of stomachaches and headaches as adults (Lewis & Lewis, 1989). One 20–year follow-up study revealed that migraines were now a problem for a large percentage of adults who had RAP (70%), limb pain (66%) and headaches (33%) when they were children (Salmon, 1985).

FAMILY AND ENVIRONMENTAL VARIABLES

Family Functioning

Some dysfunctional family systems maintain their equilibrium only as long as a family member has a somatic symptom that serves to deflect attention from factors that would ordinarily result in conflict, for example, marital, financial, or substance abuse problems (Haggerty, 1983; Wood et al., 1989). Using ancecdotal situations to describe the "psychosomatic family mode," Castleberry (1988) demonstrated how the power of "family rules" in dysfunctional families fosters and maintains psychogenic symptoms in children. The secondary gain for the child is increased attention and school avoidance. Most research findings do not support the hypothesis that children with psychogenic pain come from dysfunctional families, however.

When psychometrically sound measures were used, four studies with clinical or school samples showed no significant differences in family functioning between asymptomatic children and children with RAP (Raymer, Weininger, & Hamilton, 1984; Robinson, Greene, & Walker, 1988; Sawyer, Davidson, Goodwin, & Crettenden, 1987; Wasserman et al., 1988), chest pain and limb pain (Robinson et al., 1988). In a study in which family functioning was measured by observation rather than self-report, Castleberry's psychosomatic family model was supported (Wood et al., 1989). Videotapes of family interactions revealed that families of children with RAP demonstrated enmeshment, rigidity, and poor conflict resolution, but not overprotection, as expected. The authors postulated that the child with RAP serves as a scapegoat for family conflict. Interrater reliability of interaction scores between two independent observers was 0.70–0.90. No comparison of families with asymptomatic children was made, however, to determine if similar family interaction styles exist.

Results are equivocal on the prevalence of marital problems and/or single-parent families with respect to psychogenic symptoms in children. In one study

of children with chest pain (n = 100, 91% black), there were more frequent family separations than the national statistics would have predicted (Pantell & Goodman, 1983). Other researchers have shown that single-parent families were significantly more prevalent in samples of children with RAP compared to samples of asymptomatic children (30% versus 18.6%) (Crossley, 1982). Similar findings are available for children with headaches (39% versus 9%) (Larsson, 1988). On the other hand, four studies with samples of fewer than 50 subjects per group found no differences in parental marital status (Faull & Nicol, 1986; McGrath, Goodman, Firestone, Shipman, & Peters, 1983; Walker & Greene, 1989; Zuckerman, Stevenson, & Bailey, 1987).

The weak empirical support for the theory linking family functioning with psychogenic pain can be interpreted in many ways: the theory is incorrect, the operational definitions of family functioning are not sufficiently sensitive, or other methodological problems have clouded the relationship. Further, the role of family functioning in the etiology of symptoms cannot be evaluated without prospective studies. A more in-depth theoretical analysis of the connection between family systems and psychogenic symptoms is needed before further descriptive research is done.

Family History of Pain

Investigators have clearly shown that a family history of chronic pain or other symptoms was more typical of children with psychogenic pain than asymptomatic children (Burg, 1987; Wasserman et al., 1988; Mortimer & Good, 1990; Larsson, 1988; Pantell & Goodman, 1983; Garber, Zeman, & Walker, 1990). There were three potential explanations for the appearance of symptoms in children belonging to these families (Apley, 1975). Children may have an inherited predisposition for symptoms similar to their parents' symptoms; children may learn symptom-behavior from observation of their parents; or, parents' fussing over children's somatic complaints, while ignoring other behavior (e.g., aggression) may serve to reinforce the use of symptoms for attention (Apley, 1975). A fourth explanation may be that children have the same undiagnosed medical or surgical "organic" problem as their parents.

Compared to family members of asymptomatic children, more family members of children with RAP had a history of RAP themselves (Bury, 1987), peptic ulcer (Wasserman et al., 1988), unexplained pain (Geist, 1989; Magni, Pierri, & Donzelli, 1987), migraines and "nervous trouble" (Mortimer & Good, 1990; Robinson et al., 1989), depression, anxiety, and somatization disorders (Walker & Greene, 1989), and lengthy parental illness over the past 3 months to 1 year (Crossley, 1982; Garber et al., 1990; Zuckerman, Stevenson, & Bailey, 1987). Similarly, 40% of children with headaches had parents with a history of headaches (Larsson, 1988; Werder & Sargent, 1984), and parents of 45%

of children with chest pain also had chest-related problems (Pantell & Goodman, 1983). In studies that differentiated among family members, typically, mothers rather than fathers had the majority of symptoms (Garber et al., 1990; Mortimer & Good, 1990; Robinson et al., 1989; Routh & Ernst, 1984; Walker & Greene, 1989). Only two research teams showed no difference in family history of pain between RAP and asymptomatic children (Faull & Nicol, 1986; McGrath et al., 1983). Although there has been ample descriptive work, theory-generating and theory-testing research is needed to explain whether children have psychogenic pain because the pains are inherited, learned, or reinforced.

Stressful Life Events

Two distinct theories regarding the relationship between stressful life events and illness have been tested with children who have psychogenic pain. One theory hypothesizes that the amount of life change caused by stressful life events, not the events per se, puts an individual at risk for health problems (Holmes & Masuda, 1974). Six research teams used life change unit (LCU) measures of stress, but none of the six studies had a large enough sample (n = 16 to 31 per group) to detect a moderate effect size. Data from four of the six studies revealed no significant differences between children with RAP or headaches and asymptomatic children (Kowal & Pritchard, 1990; McGrath et al., 1983; Raymer et al., 1984; Wasserman et al., 1988). The hypothesis was supported by two studies of children with RAP who had significantly higher LCU scores than asymptomatic children (Hodges, Kline, Barbero, & Flanery, 1984; Robinson et al., 1989). Item analysis of life events in one of the studies showed that children with RAP experienced more health- and death-related stressors than asymptomatic children (p-value not reported) (Hodges et al., 1984). A step-wise multiple regression showed that the LCU score explained 10% of the variance and was a significant predictor of the severity of headache pain in 23 children (Kowal & Pritchard, 1990). The validity of this line of research is compromised by the fact that data in four of the five LCU studies were collected from parents rather than from the children themselves. Further, in each instrument used, the amount of life change assigned to each event was determined by adults without validation by children (Ryan, 1988).

An alternative theory is that the individual's own appraisal of a stressful life event as a threat, benign/positive, or a challenge is one determinant of the outcome of the stress-coping process (Lazarus, 1966, 1991). Self-report methods in which stress was measured from the children's perspective were used in five studies. Data from all of the studies indicated that children with RAP (Adams & Weaver, 1986; Greene, Walker, Hickson, & Thompson, 1985; Robinson, Greene, & Walker, 1988; Sharrer & Ryan-Wenger, 1991), headache

(Adams & Weaver, 1986; Larsson, 1988), limb pain (Robinson et al., 1988), and chest pain (Adams & Weaver, 1986) had significantly higher stress scores than asymptomatic children. Sample sizes ranged from 12 to 70 per group. In the study with the largest sample size, an investigator-designed an 11–item measure with no established reliability and validity was used (Larsson, 1988), whereas previously tested instruments were used in the other four studies. In a single sample study, 100 children with chest pain were interviewed regarding the incidence of negative life events prior to the onset of chest pain (Pantell & Goodman, 1983); however, the reliability of interview data was not established. It was noted that 26% and 31% of the children identified negative life events in the previous 3 and 6 months, respectively, but there was no comparison group of asymptomatic children to determine the extent to which these percentages are abnormal. When asked what they think caused their own headaches, 30% of 198 elementary and 40% of 660 secondary school children named "stress" as the cause (Passchier & Orlebeke, 1985). In the same study, a stepwise multiple regression revealed that self-identified fear of failure and school problems each contributed a significant proportion of the variance in the frequency, intensity, duration, degree of interference with normal activity, and consequences of headache pain.

In all but two of the above studies (Pantell & Goodman, 1983; Robinson et al., 1989), researchers examined stressful life events without regard to the timing of the event compared to the symptom. More research is needed to determine the extent to which stressful events are precipitant to or concomitant with the symptom. It may be that the experience of pain is unrelated to stress, but that the pain heightens one's perceptions of stress. Clinical intervention research is needed in which children with psychogenic pain are helped to identify and modify their own stressors and to cope with stressors that cannot be changed. This type of research will further test the hypothetical links between stressful life events and psychogenic pain in children.

PSYCHOSOCIAL VARIABLES

Depression, Anxiety, and Self-Esteem

There is no specific theory that links psychogenic pain in children with depression, anxiety, or self-esteem, but most research on the relationship among these variables was conducted to test the clinical observation that these children appear to have emotional problems and lack self-esteem. Research findings are divided on the issue of depression and psychogenic pain. Significant positive correlations ($r = 0.17–0.48$) between depression and somatic symptom scores were observed for children with RAP, headache, and limb pain (Larsson, 1991). When criteria from the Diagnostic and Statistical Manual of Mental Disorders,

Version III (DSM-III; American Psychiatric Association, 1980) were applied, 5 out of 13 children with RAP were diagnosed with a major depressive disorder, as opposed to none of the 16 asymptomatic children in the study (no *p*-value reported) (Garber et al., 1990). Significantly higher depression rating scales scores were found by self-report for children with RAP ($n = 41$) (Walker & Greene, 1989) and by parent-report for children with headaches ($n = 70$) (Larsson, 1988). Conflicting outcomes occurred in four studies that compared small groups of children with RAP or headaches ($n = 16$ to 30) to asymptomatic children. The investigators found no significant differences in depression scale scores (Kowal & Pritchard, 1990; McGrath et al., 1983; Raymer et al., 1984; Routh & Ernst, 1984). Investigators used reliable and valid depression inventories appropriate for children in each of these studies.

The preponderance of evidence indicated that children with psychogenic pain tend to be anxious. Scores on an investigator-developed Habitual Somatic Discomfort Questionnaire (HSDQ) correlated positively with anxiety scores for 90 13– to 18–year old children ($r = 0.30$–0.42), but not for 11-year old children (Rauste-von Wright & von Wright, 1981). In another study, a stepwise multiple regression showed that for 23 children with headaches, anxiety scores explained 22.4% of the variance and was a significant predictor of the severity of headache pain (Kowal & Pritchard, 1990). A single sample study showed that 21 out of 22 children with RAP met DSM-III criteria for several anxiety disorders (Astrada, Licamele, Walsh, & Kessler, 1981). Through a clinical interview, one researcher found that 84% of clinic RAP patients worried about themselves and their parents, which is more than twice that expected of the general population of children (Wasserman et al., 1988). Clinical interviews with children with RAP resulted in significantly more DSM-III diagnoses of "over-anxious disorder" compared to asymptomatic children in two studies (Garber et al., 1990; Hodges et al., 1985a). Similarly, when reliable and valid self-report instruments were used, anxiety scores of children with RAP (Hodges et al., 1985b; Walker & Greene, 1989) and headache (Larsson, 1988) were significantly higher than scores of asymptomatic children. With respect to long-term prognosis, a retrospective chart review indicated that for 17% of the sample, RAP in childhood was a precursor to somatization disorder (hysteria) in adults (Ernst, Routh, & Harper, 1984).

In three of the above studies, mothers of children with RAP also had significantly higher anxiety scores than mothers of asymptomatic children (Garber et al., 1990; Hodges et al., 1985b; Walker & Greene, 1989). Results are equivocal, however, for the fathers of children with RAP, that is, their anxiety scores were significantly higher in one study (Hodges et al., 1985b), but nonsignificant in another study (Garber et al., 1990). One study revealed no differences in anxiety scores between asymptomatic children and 10 children with RAP; however, anxiety scores were based on the children's response to one ques-

tion, "How nervous are you?" on a scale of 1 to 10 (Feuerstein, Barr, Francoeur, Houle, & Rafman, 1982). Similarly, no differences between children with headache and asymptomatic children (n = 23 per group) were found when a psychometrically sound measure was used (Kowal & Pritchard, 1990).

Data from three studies showed that despite small sample sizes (n = 16 to 31), self-esteem scores of children with headache, RAP, limb, or chest pain were signficantly lower than scores of asymptomatic (Raymer et al., 1984; Robinson et al., 1988) or chronically ill children (Adams & Weaver, 1986). One-third of the 16 children with RAP had scores more than 2 SD below the mean on the Coopersmith Self-Esteem Inventory (Raymer et al., 1984). A six-item measure of self-esteem, with no evidence of reliability or validity, was used in one of the above studies (Robinson et al., 1988).

Because all the above studies were conducted at one point in time, when children had already developed symptoms, the above findings only support clinical observations that children with psychogenic pain tend to be depressed, anxious, or have low self-esteem; there are no prospective studies which indicate that these variables are *etiological.* The major gap in this line of research is the lack of a theoretical base for linking psychogenic pain with depression, anxiety, or self-esteem. Without a viable theory to describe, explain, and predict relationships among these variables, further descriptive work of this type does not build knowledge about psychogenic pain in children, hence both prevention and intervention studies would be premature.

Problem Behavior

Research results supported clinical observations that children who experience psychogenic pain often demonstrate problem behavior at home. Using the Child Behavior Checklist (CBCL), a popular psychometric measure, several researchers found significantly more problem behavior in children with RAP (n = 13 to 41) compared to asymptomatic children (Garber et al., 1990; Sawyer et al., 1987; Walker & Greene, 1989; Wasserman et al., 1988). Similarly, structured interviews with parents revealed that children with RAP and headache were significantly more dependent and/or had more fears (Zuckerman et al., 1987), were more "neurotic" (Crossley, 1982), and displayed more antisocial behavior (Faull & Nicol, 1986) than asymptomatic children. Only one parental interview study showed no difference between symptomatic and asymptomatic groups on problem behavior at home (Davison, Faull, & Nicol, 1986). It is possible that psychogenic pain makes children irritable, causing them to act out their distress. On the other hand, parental responses may have been biased.

Contrary to home behavior, school behavior as reported by teachers on the CBCL (Garber et al., 1990; Walker & Greene, 1989; Wasserman et al., 1988)