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Parental Overprotection and Heart-Focused Anxiety in Adults with Congenital Heart Disease

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Abstract
Background The care of adult patients with congenital heart disease (CHD) is challenging from a mental health perspective, as these patients continue to face a variety of biopsychosocial issues that may impact emotional functioning. Despite these issues, there are limited data on the psychosocial functioning of adults with CHD, and there are no data on the impact of parental overprotection on heart-focused anxiety in this patient population.
Purpose The aim of this study was to examine the relationships between patient recollections of parental overprotection and current heart-focused anxiety in adults with CHD.
Method A cross-sectional sample of 190 adult patients with CHD (51% male; mean age=32.28, SD=11.86 years) completed validated measures of perceived parental overprotection (Parental Bonding Instrument) and heart-focused anxiety (Cardiac Anxiety Questionnaire).
Results The results indicated that perceived parental overprotection ($\beta=0.19$, $p=0.02$) and heart defect complexity ($\beta=0.17$, $p=0.03$) were significantly related to heart-focused anxiety. Contrary to hypotheses, perceived parental overprotection did not vary as a function of heart defect complexity (F (2, 169)=0.02, $p=0.98$).
Conclusion Perceived parental overprotection and heart defect complexity are associated with heart-focused anxiety in adults with congenital heart disease. These results can inform the development of clinical interventions aimed at improving the psychosocial adjustment of this patient population.

Keywords Congenital heart disease · Anxiety · Overprotection

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Introduction

Approximately 1% of all infants are born with congenital heart defects [1, 2]. Medical advances in the diagnosis and treatment of congenital heart disease (CHD) have enabled over 90% of children with congenital heart defects to survive into adulthood [3]. In Canada, this represents about 100,000 adults with CHD [4]. Of these, it is estimated that 55,000 will continue to require highly specialized clinical management at regional CHD centers due to the complexity and rarity of their CHD [4]. Adults with CHD are at risk for serious complications such as sudden cardiac death, heart failure, arrhythmias, and bacterial endocarditis [5].

The care of adult patients with CHD is also challenging from a mental health perspective, as many of these patients continue to face a variety of biopsychosocial issues that may impact emotional functioning, such as premature

mortality, neurocognitive deficits, body image concerns (e.g., smaller stature, cyanosis, surgical scars, and clubbed digits), physical limitations, lower educational and occupational attainment, delayed social maturation, and limitations in interpersonal relationships (see 6, 7). The persistence of severe or disabling physical health problems into adulthood has been observed in other patient populations (i.e., adult survivors of other chronic pediatric illnesses) to increase the likelihood of later psychiatric difficulties [8]. Despite these issues, there are limited data on the psychosocial functioning of adults with CHD [9].

The available evidence is inconsistent regarding the psychosocial adjustment of this population. Some European studies have reported that adults with CHD are well adjusted relative to reference norms [10, 11] and orthopedic outpatients [12] in terms of lower psychopathology [12], lower hostility [10, 11], better self-esteem [10, 11], and lower neuroticism [10, 11]. However, two European studies have reported some evidence of psychopathology in their samples with respect to somatic complaints and obsessive thoughts [13] and significant depressive symptoms [14]. There is also evidence from North American investigations that adults with CHD report significant psychological distress [15–18]. For instance, Horner et al. [17] observed that 28% of their sample met diagnostic criteria for a psychiatric disorder upon clinical interview. Similarly, 35% of Bromberg et al.'s [16] sample met diagnostic criteria for a psychiatric disorder by semi-structured interview.

The impact of heart disease complexity on psychological functioning is also unclear. Some investigations have noted a significant association between disease severity and psychological symptoms [14, 16], while others have failed to find an association between disease severity and psychological distress [10, 11, 13]. The inconsistencies in findings may be due to differences in measuring disease severity as studies that did not observe effects relied on CHD diagnosis [10, 11], while studies that found a relationship between disease severity and emotional functioning employed a cardiologist-rated medical severity questionnaire [16] and New York Heart Association Functional Class [14]. Differences in assessment instruments used to measure psychological distress may also account for inconsistencies across studies.

Heart-Focused Anxiety

In addition to conventional indicators of psychological functioning, a distinctive mental health concern relevant to cardiac patients is heart-focused anxiety, which is defined as a fear of heart-related symptoms and sensations precipitated by perceived negative consequences associated with cardiac-related sensations [19]. While this construct was originally conceptualized to describe cardiac-related anxiety in heart-healthy individuals, there is evidence to suggest that patients with cardiac conditions may also experience significant heart-focused anxiety [19–21]. For instance, heart-focused attention and fear of cardiac sensations have been found to predict self-reported chest pain intensity among patients with coronary artery disease [22]. Recent data also suggest that heart-focused anxiety is significantly correlated with increased symptoms of anxiety and depression and lower health-related quality of life among patients undergoing cardiac surgery [21]. In addition, Hoyer et al. [21] found that 20% of their sample (N=90) continued to report clinically elevated levels of heart-focused anxiety 6 months following cardiac surgery.

To date, there are minimal data examining heart-focused anxiety in adults with CHD. The findings of Utens et al. [13] indicate that adults with CHD may exhibit increased attention to somatic sensations and health-related worries. Research has also shown that adults with CHD are significantly more distracted by heartbeat sounds relative to healthy controls [23]. Although it is unclear whether these associations clearly represent heart-focused anxiety, it is plausible that the ongoing biopsychosocial challenges and medical residua that CHD patients face as a result of having a congenital heart defect may precipitate heart-focused anxiety.

Parental Overprotection

Several theories have been proposed to explain individual differences in vulnerability to emotional disorders, such as diathesis–stress models (e.g., 24) and cognitive theories (e.g., 25). Other theories maintain that disruptions in the parent–child bond contribute to social and cognitive vulnerabilities to emotional distress in adulthood [26, 27]. Both qualitative findings [28] and clinical observations [6] suggest that explanatory models based on the parent–child relationship may be particularly relevant to understanding the emotional functioning of CHD patients.

One widely used approach to conceptualize the parental bond is to describe it in terms of two dimensions, care and overprotection [29]. Care is defined as "affection, emotional warmth, empathy and closeness," while overprotection is construed as "intrusion, excessive contact, infantilization, and prevention of independent behavior" (p. 8, 29). Optimal bonding is said to occur when there is high care and low overprotection. Conversely, vulnerability to psychopathology is heightened when the parental bond is characterized by low care and high overprotection.

Previous research suggests that levels of maternal protection may be higher in children with CHD compared to healthy controls [30]. Linde and colleagues [31] also reported an association between increased maternal anxiety/protection and poor emotional adjustment in children with CHD. In addition, Garson et al. [32] conducted informal interviews with families of children with CHD and noted that parental overprotection appeared to be unrelated to the

child's degree of heart disease severity, suggesting that the presence of any CHD may be sufficiently anxiety-provoking in some parents to elicit overprotective behaviors. However, it should be noted that protective parental behavior may represent an understandable reaction to giving birth to a "blue baby" who perhaps was not expected to reach adulthood. It is important to avoid pathologizing all parental attentiveness, as parents might understandably become more watchful after their child undergoes heart surgery in the first years of life.

In a qualitative study examining the psychosocial experiences of women with CHD, respondents often reported that parental overprotectiveness and constant vigilance were important aspects of growing up with CHD that led to feelings of infantilization, significant activity limitations, and fears of imminent death [28]. Parental overprotection appears to extend into adulthood, as parents are frequently observed to accompany adults with congenital heart disease (ACHD) patients to outpatient cardiology clinics [6]. Parental overprotection may also foster dependence and promote delayed social maturation, which might explain why adults with CHD are less likely to be married or cohabiting and are more likely to live with their parents relative to healthy age-matched controls [10, 33].

Past research suggests that parental overprotection may be a risk factor for the pathogenesis of anxiety disorders [34]. For instance, overprotective parenting has been linked to trait anxiety [35] and anxiety disorders such as obsessive-compulsive disorder, panic disorder, and social phobia [34, 36, 37]. Parental overprotection might contribute to increased heart-focused anxiety in ACHD patients through selective learning and reinforcement of "cardio-protective" behaviors. For instance, patients whose parents restricted activity in childhood due to fear of negative cardiac consequences might grow up restricting themselves of activity due to fear of triggering cardiac symptoms.

Study Objectives

Although clinical observation and qualitative data suggest that parental overprotection may be a significant concern among ACHD patients, there are limited data examining the relationship between parental overprotection and psychological adjustment in this patient population. Given the link between parental overprotection and the development of anxiety disorders, this study sought to investigate the relationship between patient recollections of parental overprotection and heart-focused anxiety in adults with CHD. This study also examined whether heart-focused anxiety and parental overprotection vary as a function of heart defect complexity. The following hypotheses were tested: (1) higher perceived parental overprotection is associated with greater heart-focused anxiety, (2) greater heart defect complexity is associated with higher heart-focused anxiety, and (3) greater heart defect complexity is correlated with higher perceived parental overprotection.

Method

Procedures

The present investigation is a part of a larger study entitled, "The Psychosocial Adjustment of Canadian Adults with Congenital Heart Disease," and involves a consecutive sample of ACHD patients who were recruited from an outpatient clinic of the Toronto Congenital Cardiac Centre for Adults at the University Health Network. The parent study is part of a two-site investigation (Toronto, Ontario, Canada; Gainesville, Florida, United States) of the psychosocial burden of ACHD patients [18]. The study protocol was approved by the research ethics boards at each site.

Data Collection

Participants who provided informed consent were asked to complete self-report measures on the day of their outpatient visit. Patients who were unable to complete the questionnaires during the clinic visit were given pre-addressed, stamped envelopes for the return of questionnaires via mail. In addition, one to two patients per clinic day were randomly invited to participate in a semi-structured clinical interview, the Structured Clinical Interview for DSM-IV (Diagnostic and Statistical Manual, Fourth Edition) Axis I Disorders [38], for the assessment of psychiatric disorders. Findings from the clinical interview data have been reported elsewhere [18]. Only the self-report data were analyzed in the present study.

Inclusion Criteria

Patients who were at least 18 years of age and met the following criteria were included in the study: (1) structural heart disease, as documented by echocardiogram, cardiac catheterization, or previous surgery, and (2) ability to provide informed consent and complete questionnaires in English.

Exclusion Criteria

Patients who had significant cognitive impairments (e.g., Down Syndrome) documented in their medical charts were excluded from the study.

Demographic and Medical Variables

Information on ethnicity, education, household income, employment status, marital status, and history of psychological treatment were collected by participant self-report.

A medical record review was performed to collect data on cardiac diagnoses, treatment history, functional class, and current medications. Cardiac diagnoses were confirmed by surgical history, echocardiography, and/or catheterization reports. Heart defect severity was classified as simple (e.g., isolated small ventricular septal defect and isolated small congenital aortic valve disease), moderate (e.g., coarctation of the aorta and Tetralogy of Fallot), or great complexity (e.g., cyanotic heart disease and transposition of the great arteries) based on published guidelines [39].

Measures

Trait anxiety was measured with the State-Trait Anxiety Inventory, Trait version (40). This 20-item scale assesses a general or dispositional tendency to experience anxiety. Its reliability and validity have been well established. Scores range from 20–80. Higher scores indicate higher levels of trait anxiety.

Heart-focused anxiety was assessed using the Cardiac Anxiety Questionnaire (CAQ; 19), an 18-item scale that features three subscales: (1) heart-focused worry and fear (e.g., "If tests come out normal, I still worry about my heart"), (2) avoidance behavior (e.g., "I avoid activities that make my heart beat faster"), and (3) heart-focused attention (e.g., "I pay attention to my heart beat"). Items are rated on a five-point Likert-type scale (0=never and 4=always). The mean of all 18 items comprise the total score (range 0–4), which was used to assess heart-focused anxiety in this study. Higher scores signify greater heart-focused anxiety.

The Parental Bonding Instrument (PBI; 29) includes 25 items intended to capture parental care and perceived overprotectiveness. Respondents are instructed to answer each item based upon past experiences with a parent or guardian during the first 16 years of life. The PBI originally yielded two factors: (1) parental care (e.g., "was affectionate to me"), and (2) parental overprotection (e.g., "tried to control everything I did"). Scores range from 0–36 and 0–39 for the parental care and overprotection factors, respectively [29]. Higher scores indicate greater perceived care and overprotection. The PBI has acceptable reliability and validity [29]. Long-term stability of the PBI has been established by a study conducted by Wilhelm and colleagues [41] who administered the PBI four times over a 20-year period and found that PBI scores remained stable over time, and that score stability was unaffected by factors such as mood and life experiences. Only the overprotection subscale was utilized in this study.

Control Variables

Demographic and clinical information (e.g., surgical history, diagnoses, and functional class) was obtained via medical chart review and participant self-report. Age, gender, education, heart defect complexity, and trait anxiety were selected as control variables for the analyses. The education variable was a dichotomous variable (i.e., less than a college/university degree versus college/university degree or higher). Control variables were selected a priori on the basis of theoretical considerations, clinical experience, and past empirical investigations [10–12, 16].

Statistical Analyses

Study variables were screened for outliers and potential violation of distributional assumptions. Multiple regression was used to test the association between parental overprotection and heart-focused anxiety. Variables were entered into the model in two blocks. The demographic control variables (age, gender, and education) were entered in the first block. The education variable was a dichotomous variable (post-secondary school or less versus some post-secondary education or a college/university degree). Trait anxiety was entered in the second block to examine the relationship between parental overprotection and cardiac anxiety, independent of trait anxiety. Heart defect complexity and parental overprotection were also entered in the second block.

A 1×3 analysis of covariance was performed to test whether parental overprotection scores varied as a function of heart defect complexity. Age, gender, and education were entered as covariates. Pairwise comparisons were tested with the Tukey's honestly significant difference test.

Results

Prior to the analyses, study variables were screened for out-of-range and outlying values. Two univariate outliers were found in the dataset; one case was an outlier on heart-focused anxiety, and another case was an outlier on parental overprotectiveness. To reduce their impact, the scores of the outliers were changed to be 1 unit greater than the next case that is not considered an outlier [42]. Two cases were eliminated due to the fact that they were considered to be multivariate outliers.

Assessment of parametric assumptions (e.g., normality, linearity, multicollinearity, and homoscedasticity) was also performed. The distributions of trait anxiety and parental overprotection were observed to be skewed, and were corrected with a logarithmic and a square root transformation, respectively. All distributions were found to be homoscedastic. Scatterplots indicated that the parental overprotection and heart-focused anxiety were linearly related, and there was no evidence of multicollinearity.

Clinical and Demographic Characteristics

Demographic and clinical characteristics of the sample are presented in Table 1. Of the 241 patients approached for

Table 1 Participant characteristics

Characteristic	*n* (%)
Age (32.28±11.86 years)	
Gender (*n*=190)	
Male	97 (51)
Marital status (*n*=178)	
Partnered	78 (44)
Education (*n*=179)	
College or university degree	98 (55)
Employment (*n*=183)	
Employed	132 (72)
Disease complexity (*N*=190)	
Simple	21 (11)
Moderate	119 (63)
Great	50 (26)
CCS functional class (*N*=190)	
I	130 (68)
II	44 (23)
III	16 (8)

CCS Canadian Cardiovascular Society, *I* ordinary physical activity does not cause angina/shortness of breath, *II* slight limitation of ordinary activity (e.g., angina/shortness of breath might occur with walking or climbing stairs rapidly), *III* marked limitation of ordinary physical activity (e.g., angina/shortness of breath occurs walking one or two blocks on the level)

study participation, 22 declined, 219 consented, and 192 returned the study questionnaires (51% male; mean age= 32.28, SD=11.86 years), yielding a participation rate of 79.7%. Most participants had CHD of a moderate complexity (63%), and 68% had no functional impairment due to cardiac symptoms. Forty-four percent of the participants were married or living with a partner, and 72% were currently employed. With respect to household income, 31% reported earning less than $30,000 per year, 26% reported earning between $30,000 and $59,999, and 43% reported earning more than $60,000 per year (all figures in Canadian dollars).

Parental Overprotection and Heart-Focused Anxiety

Means, standard deviations, and alpha reliabilities for the study questionnaires are presented in Table 2. Reliability analyses indicated that the PBI–Overprotectiveness subscale and the CAQ were both internally consistent (PBI–Overprotectiveness, α=0.89; CAQ, α=0.87).

Preliminary analyses showed that parental overprotection was significantly correlated with heart-focused anxiety (r= 0.30, p<0.001). Next, a regression model was tested to determine whether parental protection continued to be related to heart-focused anxiety when age, gender, education,

Table 2 Descriptive statistics for study variables

Measure	*M*	SD	Range	Cronbach's α
Heart-focused anxiety (CAQ)[a]	1.29	0.65	0.00–3.61	0.87
Parental overprotection (PBI)[a]	11.93	8.36	0.00–33.00	0.89
Trait anxiety (STAI)[b]	35.85	11.45	20.00–70.00	0.94

M mean, *SD* standard deviation, *CAQ* Heart-focused anxiety Questionnaire, *PBI* Parental Bonding Instrument, *STAI* State-Trait Anxiety Inventory

[a] *n*=180

[b] *n*=172

trait anxiety, and heart defect complexity were simultaneously entered into the model (see Table 3). The results indicated that parental overprotection (β=0.19, p=0.02) remained significantly related to heart-focused anxiety in the multivariable model. Of the covariates tested, age (β=0.15, p=0.04), trait anxiety (β=0.26, p=0.001), and heart defect complexity (β= 0.17, p=0.03) were also reliably associated with heart-focused anxiety. Sex and education were not significantly related to heart-focused anxiety.

Parental Overprotection and Heart Defect Complexity

Contrary to hypotheses, parental overprotection scores were found to be unrelated to heart defect complexity (F (2, 169)= 0.02, p=0.98; see Table 4), after adjusting for the effects of age (F (1, 169)=0.26, p=0.61), sex (F (1, 169)=2.21, p= 0.14), and education (F (1, 169)=0.25, p=0.62).

Table 3 Summary of regression analysis: the association between heart-focused anxiety and parental overprotection (*N*=159)

Analysis of Variance				
Source	D*f*	MS	*F*	*p*
Between	6	2.22	6.75	0.000
Within	153	0.33		
Total	159			
R^2 = 0.21; Adjusted R^2 = 0.18				
Parameter Estimates				
Variable	*B*	SE	*t*	*p*
(Constant)	−1.75	0.62	−2.83	0.01
Age	0.01	0.00	2.07	0.04
Sex	0.12	0.09	1.33	0.19
Education	−0.02	0.09	−0.21	0.84
Heart disease complexity	0.17	0.08	2.26	0.03
Trait anxiety	1.29	0.39	3.32	0.00
Parental overprotection	0.09	0.04	2.34	0.02

Dependent variable: heart-focused anxiety

Table 4 Heart-focused anxiety and parental overprotection by heart defect complexity (N=180)

Heart defect complexity	Heart-focused anxiety	Parental overprotection
Simple	1.13 (0.81, 1.45)	12.79 (9.07, 16.50)
Moderate	1.25 (1.13, 1.36)	11.80 (10.25, 13.35)
Great	1.46 (1.26, 1.66)	11.88 (9.32, 14.44)

Mean (95% confidence interval)

Discussion

This study investigated the relationship between parental overprotection and heart-focused anxiety in a cross-sectional sample of ACHD patients. Sample means for heart-focused anxiety were comparable (i.e., within one standard deviation) to published values for a sample of post-angiography outpatients [19] and a sample of primary and secondary prevention patients attending a cardiac education session [43]. The current sample scored approximately one standard deviation lower than means reported for cardiac inpatients [20]. With respect to parental overprotection, the mean of the current sample was consistent with published normative values for a sample of 410 primary care patients [29]. However, parental overprotection scores for the current sample were more comparable with levels reported by non-anxious controls than with scores reported by patients with anxiety disorders [34, 36, 37]. Similarly, trait anxiety scores were consistent with normative data reported for a non-clinical sample of working adults [40]. Altogether, these comparisons suggest that the average ACHD patient in the current sample did not exhibit clinically elevated scores on trait anxiety, heart-focused anxiety, or parental overprotection.

As hypothesized, higher levels of parental overprotection were associated with higher levels of heart-focused anxiety. Regression analyses showed that this association remained significant even when age, gender, education, trait anxiety, and heart defect complexity were simultaneously tested in the model. Therefore, the experience of greater parental overprotection during childhood and adolescence may contribute to heart-focused anxiety during adulthood.

It is noteworthy that a few decades ago, patients with CHD were significantly less likely to survive to adulthood, which might explain why some parents may have been extra cautious and vigilant of their children, particularly with respect to cardiac symptomatology. These behaviors might have been appropriate and even encouraged by medical teams. Parents of children with CHD are typically expected to monitor symptoms, ensure attendance at regular cardiology appointments, manage medication regimens, and provide support during and following cardiac surgeries and other interventions. A hypervigilant and overly cautious parental style, however, might encourage similar behaviors in children growing up with CHD. In terms of possible mechanisms relating parental overprotection and heart-focused anxiety, Turgeon and colleagues [34] suggest that overprotective parents may hold negative outcome expectancies about their child's ability to cope with stressful events and therefore discourage their child's participation in potentially stressful activities, which may in turn encourage avoidance behaviors. Hence, it is possible that overprotective parental behaviors may foster feelings of dependency, an external locus of control, and low self-efficacy, all of which might hinder adult CHD patients' efforts at coping with heart-related symptomatology. Adults with CHD who report their parents as being overprotective might have learned to form negative interpretations of their symptoms and use maladaptive coping behaviors like avoidance and fearful responding when experiencing cardiac symptoms or when faced with situations that trigger cardiac-related sensations.

Contrary to the findings of Utens et al. [10] and van Rijen et al. [11], greater heart-focused anxiety was found to be associated with greater heart defect complexity. Compared to patients with less complex heart defects, patients with greater defect complexity may be more symptomatic, have greater functional impairments, and have a history of more extensive and frequent interventions, which may elicit anxious responses to cardiac-related sensations in vulnerable individuals. Heart-focused anxiety was unrelated to sex or educational attainment but was positively associated with age, which suggests that heart-focused anxiety does not appear to lessen with age but rather increase. This finding might be related to the general perception that cardiac vulnerability increases with age in the general population and so a similar association between cardiac risk and age might be thought to operate in young adults with CHD.

Parental overprotection was not found to be associated with age, sex, or heart defect complexity, which corresponds with the findings of Parker [44], as well as that of Garson and colleagues [32]. The lack of an association between parental overprotection and heart defect complexity suggests that having a child born with a chronic medical condition like CHD, regardless of severity of CHD, may elicit similar levels of parental protective behavior. There is some evidence that parental perspectives of a child's heart disease as being an ongoing life challenge versus being a chronic disabling condition can affect the extent to which an individual with CHD is able to normalize and integrate CHD into his/her daily life [45]. In Claessens and colleagues' [45] qualitative study, they found that if CHD was perceived by parents to be a challenge, children may learn early on how to adjust and cope with their heart defect. However, if CHD was perceived by parents as a disabling condition, they may build a protective world around their

children to reduce or compensate for the effects of CHD, which may include significant activity limitation [45]. These actions, although well intentioned, could reinforce dependency and delay the development of effective strategies for coping with CHD-related symptoms and any associated functional limitations [45].

Implications and Future Directions

Our data suggest that parental overprotective behavior during childhood and adolescence is associated with increased heart-focused anxiety in adulthood. As some parents of children with CHD might be over-restrictive of their child's activities, health care professionals are encouraged to provide very specific activity and lifestyle guidelines to foster increasing independence of adolescents and adults with CHD. Regular follow-up care should ensure that parents, as well as teachers, are not unnecessarily restricting activities. As medically appropriate, health care professionals should encourage patients to adopt a more active role in their own health care. Encouraging independent self-care and patients' active participation in health care might begin early during the transition from pediatric to adult-focused health care.

Future studies are encouraged to investigate correlates of parental overprotective behavior, such as parental perspectives or knowledge regarding their child's heart condition. Future research could also examine the associated cognitive or behavioral characteristics of elevated heart-focused anxiety and parental overprotection in order to guide clinical recommendations for psychosocial care for patients and their families. For instance, if distorted patterns of thinking are found to underlie cardiac-related fear and avoidance, clinical interventions that include cognitive restructuring techniques may prove efficacious in decreasing heart-focused anxiety in this patient population.

Limitations

The cross-sectional and correlational design prohibits the establishment of causal inferences. A prospective study that evaluates parental overprotection and heart-focused anxiety in childhood and determines whether these factors are predictive of heart-focused would provide stronger and more conclusive results. This would also reduce the influence of recall bias on the assessment of parental overprotection. A second limitation entails the fact that the study sample represents a highly select group of adult CHD patients who were being followed in a tertiary care setting, which may limit the external validity of the findings. These patients may differ from CHD patients seen in general cardiology practices or smaller CHD programs along important dimensions such as heart defect complexity and treatment history. However, patients seen at the this clinic do come from all geographical areas of the province of Ontario and from other parts of Canada and represent diverse ethnic, educational, and socioeconomic backgrounds.

Conclusions

The results of this study suggest that parental overprotection and heart defect complexity are associated with heart-focused anxiety among adult patients with CHD. Contrary to prediction, parental overprotection did not differ as a function of heart defect complexity. To our knowledge, this study is the first to provide insights into the relationships between heart-focused anxiety, parental overprotection, and heart defect complexity in adult patients with CHD. A deeper understanding of these relationships could further facilitate the development of clinical interventions aimed at improving the psychosocial adjustment of this patient population. Interventions that support appropriate levels of parental protection and/or encourage independence among adolescents and young adults with CHD could be developed. Clinicians could provide recommended activity guidelines for parents and their children to reduce limitations on activities that are deemed medically appropriate.

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