

Maternal Lifetime Depressive/Anxiety Disorders and Children's Internalizing Symptoms: The Importance of Family Context

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Abstract

Objectives: This study investigated the interaction effects between mothers' lifetime depressive/anxiety disorders and other psychosocial correlates of 6 to 11 year-old children's self-reported internalizing symptoms in the Quebec Child Mental Health Survey. **Method:** A representative subsample of 1,490 Quebec children aged 6 to 11 years was selected from the original sample. Multiple linear regression analyses were performed using children's internalizing symptoms and child, family and socioeconomic characteristics. **Results:** Four variables interacted significantly with mothers' lifetime depressive/anxiety disorders to predict 6 to 11 year-old children's internalizing symptoms: child age ($t=2.415$, $P=0.016$), mother's caring behaviours ($t=2.950$, $P=0.003$), mother's punitive behaviours ($t=2.629$, $P=0.009$) and parental social support ($t=2.272$, $P=0.023$). **Conclusion:** Results highlight the important contribution of the family context to the intergenerational transmission of internalizing symptoms and the relevance of taking into account children's developmental period. They support the importance of early screening of children's self-reported internalizing symptoms, among children of depressed/anxious parents. It is suggested to develop preventive intervention programs oriented towards children of depressed/anxious parents and exposed to relational difficulties.

Key words: *child informant, depressive/anxiety disorders, intergenerational transmission, psychosocial characteristics, psychiatric epidemiology*

Résumé

Objectif: L'objectif de cette étude était d'investiguer les effets d'interaction entre les troubles dépressifs/anxieux des mères et d'autres variables associées aux symptômes intériorisés rapportés par les enfants de 6 à 11 ans dans l'Enquête Québécoise sur la Santé Mentale des Jeunes. **Méthodologie:** Un sous-échantillon de 1490 enfants, représentatif des jeunes québécois de 6 à 11 ans, a été sélectionné à partir de l'échantillon original. Des analyses de régression linéaire multiple ont été réalisées en utilisant les symptômes intériorisés rapportés par les enfants au questionnaire Dominique et de multiples caractéristiques individuelles, familiales et socioéconomiques. **Résultats:** Quatre variables interagissaient significativement avec les troubles dépressifs/anxieux des mères pour prédire les symptômes intériorisés des enfants: l'âge ($t=2.415$, $P=0,016$), les comportements de soins des mères ($t=2.950$, $P=0,003$), les comportements punitifs des mères ($t=2.629$, $P=0,009$) et le soutien social parental ($t=2.272$, $P=0,023$). **Conclusion:** Les résultats mettent en évidence l'importante contribution du contexte familial dans la transmission intergénérationnelle des troubles intériorisés et la pertinence de prendre en compte la période développementale de l'enfant. Il est suggéré de développer des programmes d'intervention préventive destinés aux enfants de parents dépressifs ou anxieux qui vivent des difficultés familiales.

Mots clés: *informateur enfant, troubles anxieux/dépressifs, transmission intergénérationnelle, caractéristiques psychosociales, épidémiologie psychiatrique*

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Introduction

The Quebec Child Mental Health Survey (QCMHS) was conducted in 1992 on a representative sample of 2,400 children and youths aged 6–14 years living in the province of Quebec. The QCMHS was an epidemiological cross-sectional study designed to determine the prevalence (Breton et al., 1999) and identify the correlates for the most frequent mental disorders in children and adolescents from the general population. One study identified correlates of internalizing and externalizing disorders for three age-groups (6–8, 9–11, 12–14 years) according to three different informants (youth, parent, teacher) (Bergeron et al., 2000). These findings revealed the important contribution of family characteristics, thereby supporting the hypothesis that proximal variables contribute to the development of child and adolescent psychopathology. More specifically, the multivariate analysis of individual, family and socioeconomic characteristics indicated significant associations between parents' lifetime mental disorders and their children's internalizing disorders (Bergeron et al., 2000). Results showed that the presence of internalizing disorders was two to three times more likely in children or adolescents whose parents had either a major depressive episode, a simple phobia, an agoraphobia or a generalized anxiety disorder during their lifetimes (Bergeron et al., 2000). Another study of the QCMHS data confirmed the importance of the strength of association between parents' lifetime internalizing disorders and children's depressive disorders (Bergeron et al., 2007). However, no prior analysis of the QCMHS data has investigated if children report more internalizing symptoms when exposed to a combination of both parental lifetime internalizing disorder and another potentially risky psychosocial characteristic.

The objective of the present study was to identify the child, family, or socioeconomic characteristics which may moderate the association between maternal lifetime depressive/anxiety disorders and 6 to 11 year-old children's self-reported internalizing symptoms, based on data of the QCMHS. From a developmental perspective, the decision to target children aged 6 to 11 years (*versus* adolescents aged 12 to 14 years) would permit us to take into account the specific intellectual, emotional, and social organization levels usually observed at these ages (Cicchetti, Rogosch, & Toth, 1994). The choice of the multiple child, family, and socioeconomic characteristics to be investigated in this study was based on: (1) a list of variables from the QCMHS and identified as significant correlates of children's internalizing disorders; and, (2) hypotheses derived from both theoretical integrative models on the intergenerational transmission of psychopathology and previous empirical studies conducted on samples of children from the general population.

Intergenerational transmission of internalizing disorders

Being exposed to parental depression or anxiety disorders heightens children's vulnerability to develop internalizing symptoms and disorders. Past epidemiological and family studies have shown that children of depressed or anxious parents represent a high-risk group for the development of a psychopathology (Weissman, Warner, Wickramaratne, Moreau, & Olfson, 1997). Internalizing disorders are generally more frequent in these children, compared with children whose parents have never had any psychopathology (Hammen & Brennan, 2003; Lieb, Isensee, Hofler, Pfister, & Wittchen, 2002; Phillips, Hammen, Brennan, Najman, & Bor, 2005; Weissman et al., 1997). Current research has now moved beyond the question of whether parental psychopathology is associated with childhood internalizing disorders to the identification of the psychosocial correlates or mechanisms involved in this intergenerational transmission of risk. Theoretical integrative models suggest that children's internalizing disorders could be transmitted through several mechanisms involving not only genetic factors or predispositions, but also other child characteristics as well as family characteristics, and complex interactions between these multiple characteristics (Cummings & Davies, 1994; Goodman & Gotlib, 1999; Piché, Bergeron, & Cyr, 2008; Van Doesum, Hosman, & Riksen-Walraven, 2005).

Regarding age, Lieb et al., (2002) observed an earlier onset of depressive disorders for offspring of two depressed parents compared with offspring whose parents had never had any depressive disorders. Depression was also found to be more frequent in daughters than sons of depressed parents. Among other child characteristics, social functioning and stressful events emerged from a study by Hammen & Brennan (2003). First, among youths with poor social functioning, the prevalence of depression was significantly higher in offspring of depressed mothers than in offspring of non-depressed mothers. Second, both high chronic interpersonal stress and high negative life events were more strongly associated with depressive disorders in youths of depressed mothers than in youths of non-depressed mothers.

Few studies have found that children of depressed parents and exposed to various problems in their family context are more likely to develop depressive disorders (Brennan et al., 2002; Hammen & Brennan, 2003; Hammen, Brennan, & Shih, 2004; Hammen, Shih, Altman, & Brennan, 2004). Some results highlighted that maternal interpersonal stress and parenting quality may play a role in the association between mother and youth depression. Other results underscored the importance of several family discord variables such as a low marital satisfaction and poor mother-child relationship. Finally, family income may also be involved in increasing the

child's vulnerability, but findings are conflicting (Hammen & Brennan, 2003; Kaminski & Garber, 2002).

The present study

This brief review suggests that various child and family characteristics may be involved in the intergenerational transmission of internalizing disorders. However, previous studies presented four main methodological limitations (Piché et al., 2008). First, most of these studies were conducted using research designs focusing on high-risk families, by analyzing separately the two types of families. Second, some variables related to the child and his/her family (e.g. the child's stressful events), suggested by theoretical models on the intergenerational transmission of internalizing disorders, have been less studied in representative samples of young children from the general population. Third, although authors agreed on the necessity of using the child as an informant regarding his/her internalizing symptoms (Bird, Gould, & Staghezza, 1992; Kazdin, 1994), prior studies have not documented the interaction effects of parental psychopathology and correlates of children's internalizing symptoms according to the child as an informant of his/her own symptoms (Piché et al., 2008). Fourth, although most researchers acknowledge the importance of taking into account children's developmental period (Goodman & Gotlib, 1999), to our knowledge the interaction effects have not been studied in representative samples of young children from the general population.

In the present study, the data from the QCMHS were used to investigate the interaction effects between mothers' lifetime depressive/anxiety disorders and other psychosocial correlates of 6 to 11 year-old children's internalizing symptoms. Several child, family and socioeconomic variables were hypothesized to interact with maternal depressive/anxiety disorders, to statistically predict children's internalizing symptoms. This study was unique since this type of multivariate analysis had never been realized by using: (1) data from a representative sample of children aged 6 to 11 years from the general population; and, (2) the child as informant of his/her own symptoms (Piché et al., 2008).

Method

Target population, sample and data collection

The target population of the QCMHS was Quebec children aged 6 to 14 years who lived at home for at least two weeks per month in the 12 months preceding the interview. The children and one of their parents had to speak either French or English to be included in the study. A complex sampling design was used to avoid high travel costs and ensure representativeness across Quebec's 16 administrative areas. Of the 3,209 families initially contacted, 486 refused to participate

and 323 were excluded (changed residence or failed contact attempts). The response rate (83.5%) was computed on the basis of numbers of participants, refusals, those not reached, and a weight according to the eligibility rate. A brief questionnaire (a selection of sociodemographic, child's mental health, and service utilization items from the overall questionnaire) was administered to a majority of the families who refused to participate. No statistically significant differences were found between participating and non-participating families (Bergeron et al., 2000). The original survey was conducted with the approval of the Institutional Review Board (IRB) of the Rivière-des-Prairies Hospital (Bergeron et al., 2000).

In this present study, a subsample of 1,490 Quebec children aged 6 to 11 years was selected from the original sample (N=2400) of the QCMHS, whose parent respondent was the biological mother. Since 92.5% of parent respondents were biological mothers in the QCMHS (5.8% of biological fathers and 1.7% of adoptive parents), we decided to select only children whose parent respondent was their biological mothers for statistical analyses. Although categorizing subgroups based on the type of parent respondent would have been interesting, this decision helps maintain sufficient statistical power and control for the biological link between mother and child. This sample size was sufficient for the detection of small effects with a statistical power of 99% at the 0.05 significance level (Cohen, 1988).

Measurement of mental disorders

In this study, the printed version of the Dominic (Valla, Bergeron, Berube, Gaudet, & St-Georges, 1994; Valla, Bergeron, & Smolla, 2000), a pictorial self-report measure, was used directly with children to assess four internalizing disorders (simple phobia, separation anxiety disorder, over-anxious disorder, major depressive disorder), based on DSM-III-R criteria. For these disorders, there were no major differences between DSM-III-R and DSM-IV symptoms or syndromes. The Dominic had been devised to minimize errors caused by 6 to 11 years-olds' lack of attention, motivation, memory, and understanding. The comprehension of the situations depicted in the drawings included in the Dominic was tested in a sample of 150 children from the general population. The internal consistency (Cronbach's alpha coefficient = 0.62 to 0.88), test-retest reliability (intraclass correlation coefficients = 0.59 to 0.74) and concurrent validity (kappas = 0.64 to 0.88) were assessed in a sample of 143 children from the general population and outpatient clinics. In addition, norms for the Dominic were determined in the representative sub-sample of 1,575 children aged 6 to 11 years from the QCMHS (Bergeron et al., 2000).

Measurement of psychosocial variables

All the variables were assessed by parent report. More details regarding the different measures of these variables including their psychometric properties have been published previously (Bergeron et al., 2000; Bergeron et al., 2007).

Child characteristics

Child age was treated as a continuous variable. *Gender* differences were also studied. *Progression in school (lifetime)* was defined by presence or absence of school delay or special placement for learning, emotional, or behaviour disorders. The list of the *child's stressful events (past 6 months and lifetime)* included 23 situations on which most authors agree. These events were all interpreted as undesirable, except three on which consensus is less clear: adoption (lifetime), birth of a sibling (lifetime), and moving (6 months). One item from the list of stressful events was the child being victim of physical or sexual abuse during his or her lifetime, as reported by the parent. *Chronic physical illness (duration of at least 6 months)* was defined by the presence or absence of at least one chronic physical illness with or without loss of autonomy or use of medication. *Social competence (past 6 months)* was assessed by means of three questions from the parent version of the Child Behavior Checklist (Achenbach & Edelbrock, 1983). In the QCMHS, frequency of participation in groups and activities with friends referred to the number of times per week or month (Bergeron et al., 2000).

Family characteristics

Three types of *family structure (past 6 months)* were identified in our coding criteria: (1) two biological parents; (2) single-parent family; and, (3) blended family. *Only-child status* was included in *ordinal position* (only child, 1st born, 2nd born, 3rd born or later born) (Bergeron et al., 2000). *Mother's depressive/anxiety disorders (lifetime)* was measured through the Diagnostic Interview Schedule Self-Administered (DISSA) (Kovess & Fournier, 1990), an abridged version of the Diagnostic Interview Schedule (DIS) (Robins, Helzer, Croughan, & Ratcliff, 1981). It was validated in Quebec using a sample of French-speaking participants from the general population and was compared with the DIS and the diagnoses from psychiatrists. The kappa values obtained for the comparison with the DIS were .54 for panic disorder, .47 for social phobia, .40 for agoraphobia, .38 for major depression and generalized anxiety and .36 for simple phobia. Compared with clinical diagnoses, kappa values ranged from .45 (phobias) to .63 (depression). In this context, kappa values lower than .40 (minimum acceptable kappa value) may be explained, in part, by the small sample (N=237) used to analyze the level of agreement between the DISSA and the DIS. It is also possible that the difference regarding the format of these two instruments (self-administered versus face-to-face

interview) explain the low agreement for some diagnoses. Despite these limitations, the acceptability of the DISSA in the present study was based on three considerations: (1) the short self-administered format allowed to integrate this instrument in a comprehensive battery assessing multiple correlates; (2) it was not significantly associated with a social desirability scale; and, (3) previous studies demonstrated significant main effects between the most severe period of lifetime depressive/anxiety symptoms in parents and current mental disorders evaluated by the Dominic (Bergeron et al., 2000).

The Dyadic Adjustment Scale (DAS) (Spanier, 1976) assessed *the relationship over the past 6 months between the mother and a spouse who had lived with her for at least 12 months* (Bergeron et al., 2000). The Parent Behaviours and Attitudes Questionnaire measured *the frequency (past 6 months) of mothers' caring behaviours, punitive behaviours, and autonomy-promoting attitudes* (PBAQ) (Bergeron et al., 2000). Caring behaviour was defined as affective and instrumental support (e.g., helping the child to accomplish difficult tasks). Punitive parental behaviour was defined by social isolation (forbidding the child to play with other children), deprivation of privileges, rejection and physical punishment. Permissiveness was assessed according to three major categories of the child's autonomous behaviour: basic autonomy (e.g., choosing his or her own hair style), autonomy in the community (e.g., going to the grocery store or other stores) and social autonomy (e.g., choosing his or her own friends). The PBAQ includes 23 items assessed on a 4-point Likert scale. In the QCMHS, psychometric properties and norms were established for each of the three PBAQ's subscales according to gender and three age-groups (6-8, 9-11, 12-14). A standardized score (Z score) for each item was calculated, and then all z-scores were added for each subscale. Subscales were treated as a continuous variable in the QCMHS (Bergeron et al., 2000) and in the present study.

The list of *parent's stressful events (past 6 months)* included 23 situations considered in the literature to be major changes (Bergeron et al., 2000). *Chronic physical illness (duration of at least 6 months) in family members* was defined by the number of illnesses of the target child, parents and siblings and measured by the Service Utilization and Risk Factor Interview (SURF). The SURF was proposed by the QCMHS research team. The Social Support Scale (SSS) included three questions drawn from a Social Support Questionnaire that evaluates *mother's perception (present period) of emotional, instrumental, and normative support received from the spouse and/or others for parenting tasks* (Bergeron et al., 2000). These questions were chosen from a factorial analysis (factor loading coefficients: .78) of six preliminary questions during the QCMHS pilot study.

Table 1. Multiple linear regression model predicting 6 to 11 year-old children's self-reported internalizing symptoms

Independent variables	Children's internalizing symptoms (N=1,490)	
	B ⁽¹⁾	95% CI
Gender		
girls > boys	0.103	0.015, 0.190*
Birth of sibling		
birth < no birth	-0.178	-0.267, -0.089***
Parent's stressful events		
two or more > one/none	0.133	0.038, 0.228**
Mother's level of education		
college or university < high school or less	-0.105	-0.198, -0.012*
MLD X age		
among older children, MLD present > MLD absent	0.141	0.033, 0.249**
MLD X caring behaviours		
among MLD present, lower caring behaviours frequency > higher caring behaviours	0.087	0.011, 0.162**
MLD X punitive behaviours		
among MLD present, higher punishment frequency > lower punishment	0.122	0.054, 0.189**
MLD X parental social support		
among higher parental social support frequency, MLD present > MLD absent	0.184	0.050, 0.319*
Adjusted R squared	0.051	

⁽¹⁾ The unstandardized regression coefficient (B) (difference between means) is reported.
 *** $p < .001$, ** $p < .01$, * $p < .05$
 MLD = Maternal lifetime depressive/anxiety disorder

Socioeconomic characteristics

Parent's level of education was defined according to three categories: (1) high school or less; (2) college or equivalent; and, (3) university graduate. Family income was measured by a question on gross family income (*past 12 months*). A variable labeled "sufficient family income" was defined by four categories proposed in the QCMHS (very low; low; low average; high average or high) (Bergeron et al., 2000).

Statistical analyses

Multiple linear regression analyses were performed using a hierarchical backward elimination strategy, as proposed in the previous analyses of the QCMHS data (Bergeron et al., 2000; Bergeron et al., 2007). Complementary analyses were conducted to identify possible interaction effects between mothers' lifetime depressive/anxiety disorders and psychosocial correlates of children's psychiatric symptoms, according to gender and two age-groups (6 to 8 year-olds; 9 to 11 year-olds). In this study, an interaction effect occurs when the nature or strength of the association between the

independent and the dependent variable varies when combined with a second independent variable (Kraemer, Stice, Kazdin, Offord, & Kupfer, 2001). All statistical analyses were adjusted for the complex sampling design used. Hence, data were weighted according to the sampling plan and the estimated design effect of 1.14.

Due to the relatively low prevalence of depressive and anxiety disorders in children aged 6 to 11 years, symptom scores for the four internalizing disorders evaluated by the Dominic were combined in a single continuous variable (internalizing symptom score) instead of a dichotomous variable (presence or absence of internalizing disorders). This variable constitutes the dependent variable considered in the statistical analyses. The independent variables were defined by child, family and socioeconomic characteristics, including combinations (i.e., interactions) between mother's lifetime depressive/anxiety disorders (presence *versus* absence) and each of the psychosocial variables.

Table 2. Multiple linear regression model predicting 6 to 8 and 9 to 11 year-old children's self-reported internalizing symptoms

Independent variables	Children's internalizing symptoms			
	6 to 8 years old (n=737)		9 to 11 years old (n=753)	
	B ⁽¹⁾	95% CI	B ⁽¹⁾	95% CI
Gender				
girls > boys	ns		0.173	0.052, 0.295**
Birth of a sibling				
birth < no birth	-0.202	-0.329, -0.074**	ns	
Parent's stressful events				
two or more > one/none	ns		0.201	0.065, 0.337**
MLD X caring behaviours				
among MLD present, lower caring behaviours frequency > higher caring behaviours	0.320	0.024, 0.616*	0.293	0.118, 0.468*
MLD X parental social support				
among higher parental social support frequency, MLD present > MLD absent	0.229	0.039, 0.419**	ns	
Adjusted R Squared	0.035		0.051	

⁽¹⁾ The unstandardized regression coefficient (B) (difference between means) is reported.
 *** p < .001, ** p < .01, * p < .05
 MLD = Maternal lifetime depressive/anxiety disorder

Results

Weighed estimates based on the QCMHS representative sample revealed a slightly higher percentage of boys (51.9%) than girls (48.1%). French was the mother tongue for 87.8% of children, and Quebec was the birthplace for 91% of the sample. About one family in four (23.4%) was in the "low-income" category, and 13.1% of the children lived in a single-parent family. In addition, 62.7% of the mothers had only completed high school. More than one third (35.9%, n=535) of biological mothers of the sample had at least one depressive/anxiety disorder in their lifetime, compared to 64.1% who had never had any internalizing disorder. Approximately 30% of mothers who had at least one lifetime depressive/anxiety disorder reported a combination of one depressive and one anxiety disorder. Children reported between 0 and 30 internalizing symptoms (mean=5.17, SD=4.87).

Main effects were found for gender (girls > boys), birth of a sibling (birth < no birth), parent's stressful events (two or more > one/none) and mother's level of education (college or university < high school or less) (see Table 1). When conducting analyses according to two age-groups, gender (girls > boys) and parent's stressful events (two or more > one/none) were associated with 9 to 11 year-old children's internalizing symptoms. Birth of a sibling (birth < no birth) was associated

with 6 to 8 year-old children's internalizing symptoms (see Table 2). In comparing boys and girls (see Table 3), we found that both genders reported less internalizing symptoms with a new birth in the family. Also, girls whose parents reported two stressful events or more reported more internalizing symptoms than girls whose parents reported one stressful event or none.

Age in combination with maternal depressive/anxiety disorders

The combination of mother's lifetime depressive/anxiety disorders and child age ($t=2.415$; $P=0.016$) (Table 1) showed one significant result. As children became older, those whose mothers had depressive/anxiety disorders reported more internalizing symptoms ($B=0.141$) than children whose mothers had never had any depressive/anxiety disorders.

Parental social support in combination with maternal depressive/anxiety disorders

The combination of parental social support and maternal depressive/anxiety disorders ($t=2.272$; $P=0.023$) showed one significant result (Table 1). Maternal history of depressive/anxiety disorders was more strongly associated with children's internalizing symptoms when mothers reported a high level of social support ($B=0.184$).

Table 3. Multiple linear regression model predicting 6 to 11 year-old boys' and girls' self-reported internalizing symptoms

Independent variables	Children's internalizing symptoms			
	Girls (n=726)		Boys (n=726)	
	B ⁽¹⁾	95% CI	B ⁽¹⁾	95% CI
Birth of a sibling				
Birth < no birth	-0.188	-0.315, -0.062***	-0.158	-0.282, -0.033*
Parent's stressful events				
two or more > one/none	0.160	0.026, 0.295*	ns	
MLD X caring behaviours				
among MLD present, lower caring behaviours frequency > higher caring behaviours	0.281	0.096, 0.466*	ns	
MLD X punitive behaviours				
among MLD present, higher punishment frequency > lower punishment	0.313	0.121, 0.504*	0.075	0.010, 0.145*
MLD X parental social support				
among higher parental social support frequency, MLD present > MLD absent	0.229	0.039, 0.419**	ns	
Adjusted R Squared	0.053		0.021	

⁽¹⁾ The unstandardized regression coefficient (B) (difference between means) is reported.
*** p < .001, ** p < .01, * p < .05
MLD = Maternal lifetime depressive/anxiety disorder

A similar trend was found when conducting analyses according to two age-groups (6-8 years; 9-11 years). Maternal lifetime depressive/anxiety disorders, combined with a high level of social support, was strongly associated with 6 to 8 year-old children's self-reported internalizing symptoms ($t=2.990$; $P=0.003$; $B=0.229$) (Table 2).

Mother-child relationship in combination with maternal depressive/anxiety disorders

The combination of mother-child relationship and maternal depressive/anxiety disorders showed two significant results (Table 1). Maternal history of depressive/anxiety disorders was more strongly associated with children's internalizing symptoms when mothers reported a low frequency of caring behaviours than when mothers reported a high frequency of caring behaviours ($t=2.950$; $P=0.003$; $B=0.087$). Also, the combination of maternal depressive/anxiety disorders and a high frequency of punitive behaviours was strongly associated with children's internalizing symptoms ($t=2.629$; $P=0.009$; $B=0.122$).

When investigating the two age-groups (6-8 years; 9-11 years), the combination of mother's caring behaviours and maternal depressive/anxiety disorders showed similar results. Having a mother with a history of depressive/anxiety

disorders and a low frequency of caring behaviours predicted a strong association with children's internalizing symptoms among both children aged 6 to 8 years ($t=2.191$; $P=0.029$; $B=0.320$) and children aged 9 to 11 years ($t=2.164$; $P=0.031$; $B=0.293$) (Table 2).

Analyses according to child sex showed two significant results, only in the sub-sample of girls. The combination of maternal history of depressive/anxiety disorders and a low frequency of caring behaviours ($t=2.004$; $P=0.045$; $B=0.281$) was strongly associated with girls' self-reported internalizing symptoms. Moreover, maternal lifetime depressive/anxiety disorders was more strongly associated with girls' internalizing symptoms when mothers reported a high frequency of punitive behaviours ($t=2.530$; $P=0.012$; $B=0.313$) (Table 3).

Discussion

Four main contributions are highlighted by this study. First, when combined with mothers' lifetime depressive/anxiety disorders, four main variables were associated with children's internalizing symptoms: child age, parental social support, and mother's caring and punitive behaviours. These results support the hypothesis of interaction effects between mothers' lifetime depressive/anxiety disorders and other psychosocial variables suggested by developmental

integrative models of intergenerational transmission of psychopathology (Van Doesum, Hosman, & Riksen-Walraven, 2005).

Second, results of this study supported the importance of taking into account the child's developmental period in the intergenerational transmission of internalizing disorders (Radke-Yarrow & Klimes-Dougan, 2002). They inform us that even at a relatively young age, children's exposure to maternal lifetime depressive/anxiety disorders heightens their probability of developing internalizing symptoms.

Third, our results suggest a major contribution from family characteristics. Of the four significant interaction effects, three concern family characteristics, thus converging with the hypothesis that the family context has a central role in the intergenerational transmission of internalizing disorders (Van Doesum et al., 2005). As suggested by another study (Hammen, Brennan, & Shih, 2004), a low level of caring behaviour was associated with a higher score of internalizing symptoms in children of depressed/anxious mothers. The combination of lifetime maternal depression/anxiety disorder and a high level of punitive behaviours was also significantly associated with children's internalizing symptoms. It is suggested that maternal depression/anxiety symptomatology may lead mothers to be less caring and more punitive towards their children, heightening the children's vulnerability to develop similar symptoms. It is also possible that mothers with a lifetime depression/anxiety disorders report themselves as less caring and more punitive with their children.

Fourth, results of the complementary analyses tended to support the literature (Lieb et al., 2002) by indicating a gender effect: girls exposed to maternal lifetime depressive/anxiety disorders and relational difficulties reported more internalizing symptoms than boys (DeWit et al., 2005). It is possible that maternal depressive interpersonal and cognitive styles have a greater influence on same-sex children or that maternal depression may elicit more caretaking behaviours in girls (Sheeber, Davis, & Hops, 2002).

One finding is more difficult to interpret. The role of parental social support in the transmission of internalizing disorders in the family has been little studied in recent years, but it has been generally proposed to act as a buffer in the development of internalizing disorders (Van Doesum et al., 2005; Goodman & Gotlib, 1999). In this study, results do not confirm this trend. It is possible that family members and friends offer more support to a mother who has a lifetime depression/anxiety disorder when they are aware that her child is developing internalizing symptoms (Bertera, 2005), particularly if the child is young (e.g., 6 to 8 year-olds). Also, depressed/anxious mothers may receive inadequate social support. Since internalizing disorders are transmitted across generations,

these mothers are more likely to be surrounded by family members who also have an internalizing disorder (Van Doesum et al., 2005; Goodman & Gotlib, 1999).

Implications

Although the generalization of these findings to a clinical population is somewhat limited, some implications for clinicians may be suggested. First, results highlight the importance for clinicians to pay special attention to one potential high-risk subgroup who seem particularly vulnerable to reporting internalizing symptoms: girls of depressed/anxious mothers exposed to low maternal caring behaviours. Thus, professionals seeing children exposed to maternal depression/anxiety disorders should be aware of the moderating effect of maternal caring behaviours for girls. Second, clinicians may wish to consider careful early screening of psychiatric symptoms and other important child and family variables such as parent-child relationship, among children of depressed/anxious parents.

It is widely recognized that lifetime psychiatric disorders have their onset in childhood (e.g., unipolar depression and anxiety disorders (Costello, Egger, & Angold, 2005)). Epidemiological researches such as the present study are necessary for the early identification of these disorders for the development of primary and secondary prevention programs (Costello, Erkanli, & Angold, 2006). In this context, it is suggested that preventive intervention programs oriented towards high-risk groups of children, such as children of depressed/anxious parents and exposed to relational difficulties, be developed and integrated in the public health and social care system. In this regard, results of this study support the relevance of family and systemic interventions, to help prevent the intergenerational transmission of psychiatric disorders, by diminishing depressive/anxiety symptoms in parents and increasing the quality of parent-child relationships or parental social support. In recent years, several programs aimed to prevent the development of depressive/anxiety disorders in children exposed to parental depression/anxiety and/or family difficulties have been developed and show promising results (Riley et al., 2008; Van Doesum, Riksen-Walraven, Hosman, & Hoefnagels, 2008; Sanders et al., 2001).

Limitations

Four main limitations must be considered in the interpretation of results. First, as the QCMHS was a cross-sectional study, the aim of the research into correlates was to formulate hypotheses regarding risk factors. Second, some variables possibly implicated in the etiology of internalizing symptoms in children (e.g., genetic contributions) were not studied, for lack of feasibility. Yet, the pre-selection of a subgroup of

children with biological mothers controls for the biological link between mother and child. Third, as this study measured the mother's lifetime depressive/anxiety disorders, no conclusion can be made regarding the mother's current psychiatric status. Bagner, Pettit, Lewinsohn & Seeley (2010) underlined the importance of timing of maternal depression for the development of internalizing problems in children. Maternal depression during the child's first year of life was significantly associated with mothers' ratings of internalizing problems in children. Yet, empirical data from previous studies suggests that the most severe period of mother's depressive/anxiety disorders may be considered a relevant index of adversity for current internalizing symptoms in children (Bergeron et al., 2000). Fourth, this dataset did not measure general social support, thus limiting the interpretation of our results. However, we hypothesized that parental social support may be associated with general social support and of greatest importance in stressful contexts (i.e. depressed/anxious parents).

In this context, these exploratory findings need to be replicated using different research designs (e.g., longitudinal) and measurement instruments, as well as with samples of adolescents and young adults. From a developmental perspective, investigating the continuity of the interplay between maternal lifetime depressive/anxiety disorders and family characteristics across the early lifespan is highly relevant.

Acknowledgements/Conflicts of Interest

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Child and Adolescent Psychiatrist

McMaster Children's Hospital in Hamilton, Ontario, Canada seeks an outstanding child and adolescent psychiatrist with expertise in the assessment and treatment of children with ADHD, psychosis, mood and anxiety disorders. Experience with evidence-based (EB) assessment instruments (e.g. CAPA, K-SADS) and rating scales is needed. Experience and commitment to multidisciplinary clinical assessment and treatment as well as team-based care and evidence-based treatment models are essential. Experience in implementing research-informed multidisciplinary clinical services is required, as is experience in leading multidisciplinary care teams in caring for children with ADHD, mood and anxiety disorders. Experience in group psychotherapy EB treatment models is also highly desired, as well as a background in research and quality improvement studies in real-world treatment settings. The position includes opportunities in leadership, program development, education and clinical research.

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