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ORIGINAL PAPER

Child Mental Illness and Mental Health Service Use: Role of Family Functioning (Family Functioning and Child Mental Health)

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Abstract

The purpose of this study was to identify which domains of family functioning were associated with odds of internalizing versus externalizing mental health disorder, past-year health professional consultations, hospitalizations, and length of hospital stay in a sample of children with a mental health disorder. One hundred children aged 6–17 years who received mental health services (inpatient or outpatient) and their parents at a large clinical paediatric tertiary care centre in Ontario were recruited in this cross-sectional study. The final recruited and analyzed sample was children aged 8–17 years. Family functioning was measured using the McMaster Family Assessment Device (FAD), child mental health disorder using the Mini International Neuropsychiatric Interview, and mental health service use using items from the 2012 Canadian Community Health Survey (Mental Health). Higher scores on affective involvement and problem solving were associated with greater odds of major depressive disorder [OR = 2.12 (1.01, 4.43)] and social phobia [OR = 1.80 (1.09, 2.98)]. Reports of better communication were correlated with lower odds of generalized anxiety disorder [OR = 0.55 (0.35, 0.84)] and shorter length of stay in hospital [OR = 0.93 (0.89, 0.97)]. Higher scores on behaviour control were associated with lower odds of social phobia and oppositional defiant disorder [OR = 0.48 (0.27, 0.86) and OR = 0.52 (0.32, 0.84)], respectively. Future research should aim to gain an understanding of strategies that ameliorate family functioning to limit the impact and severity of childhood mental health conditions.

Keywords Child mental health disorder · Mental health service use · Mental health service access · Family-centred care · Family functioning

Highlights

- Affective involvement is correlated with major depressive disorder and social phobia.
- Better communication is associated with shorter lengths of stay in hospital.
- Family-based interventions that consider child mental health need to be examined.

Childhood and adolescence is a period of experiencing increased vulnerability to developing mental health disorders (Comeau and Georgiades 2019; Georgiades et al. 2019) including internalizing (e.g., anxiety, depression) and externalizing conditions (e.g., attention-deficit hyperactivity disorder, oppositional defiant disorder). With respect to internalizing disorders, common indicators include the presence of emotional problems, social withdrawal, and challenges in establishing and maintaining social relationships (Taylor et al. 2004). Features of externalizing disorders include behavioural issues such as aggression, defiance, and a lack of impulse control (Tully et al. 2017).

Children with a mental health disorder are likely to experience symptoms throughout their lives, which increases their likelihood to drop out of school, abuse substances, have suicidal thoughts, be less physically active, and use mental health services for longer periods of time (Dittman et al. 2011; Tully et al. 2017).

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Because the family environment can significantly shape the mental and social progress of young people (Gamble and Taylor 2007), exploring the potential associations between contextual variables, such as family functioning, is crucial in understanding the development of mental health disorder among children. Because the family environment is intertwined with the development of child social and mental skills (e.g., ability to adapt to diverse situations, communicate effectively to resolve conflict, etc.), parent and child perspectives should be incorporated into the existing health care system (Jona et al. 2017). Families involved in family-centred care actively participate in care and decision-making surrounding the mental health care needs of their child alongside their health care professional, aid in the planning, delivery, evaluation, and quality of their child's mental health care (Hutch 1999).

Family functioning refers to the ability for a family to function effectively to meet basic needs and manage conflict (Jona et al. 2017). In contrast, poor family functioning relates to the presence of strain, conflict, violence, distress, and poor cohesion within the family (Dmitrieva et al. 2004). Examples of poor family functioning include critical and hostile behaviour expressed by parents, which was shown to predict child depression (Yu et al. 2015). Evidence also suggests that children are more inclined to develop bipolar, depressive, and anxiety-related disorders when their parents demonstrate elevated critical and hostile tendencies (Peris 2015). When families experience marital or parent-child conflict, including verbal disagreements, implement disciplinary actions, and greater levels of control over child decision-making (Murphy and Flessner 2015; Restifo and Bögels 2009) and subsequently experience lower family cohesion (Sander and McCarty 2005), children are more vulnerable to developing depressive symptoms and behavioural problems (Dmitrieva et al. 2004).

Specific aspects of family functioning—problem solving, communication, and behaviour control—are shown to be strong correlates of child mental health disorder. Evidence suggests that children diagnosed with attention-deficit hyperactivity disorder come from families that fail to communicate and respond well, and demonstrate poor problem solving (Pour and Kasaei 2013; Schroeder and Kelley 2009). Children also demonstrate behavioural problems, specifically aggression and anger, as well as poor behaviour control in the presence of parental conflict (Lee and Mclanahan 2016). Problem solving within the family refers to the ability for a family to effectively manage and solve issues that may threaten their capacity to function well as well as their integrity (Roman et al. 2016). Communication is the ability for family members to engage in dialogue and exchange verbal information (Jona et al. 2017). Behaviour control can allude to the standards and expectations of family members in terms of their behaviour and expression of emotions (Roman et al. 2016). However, it may also refer to how family members respond to physically dangerous events, psychobiological drives or needs, and interpersonal circumstances (Roman et al. 2016).

While mental health disorder is prevalent among children and youth, the rates of service use are particularly low in this population especially among those with clinically relevant levels of psychopathology (Gronholm et al. 2015). Definitions for mental health service use vary widely in the literature. According to the National Hospital Discharge Survey for 2006, mental health service use was defined as the number of discharges, days of care, and average length of hospital stay (Buie et al. 2010). Moreover, the Canadian Mental Health Association described mental health service access as timely access to medical and non-medical professionals, respectively (i.e., physicians, psychiatrists, etc.) (Canadian Mental Health Association 2014). Each of these mental health service use factors pertain to unique processes and/or outcomes of behaviour influenced by different predisposing, contextual, and enabling factors as supported by Andersen's Model of Health Service Use (Babtisch et al. 2012). With respect to our study, this model specifies (1) predisposing factors like youth age and sex, parent education, and income; (2) services received such as inpatient (e.g., behavioural analysis assessment, medication review, etc.) and outpatient services (e.g., family and group treatment, home-based services, psychological consultation, etc.); (3) the site where these services were received, which was at the McMaster Children's Hospital; (4) the purpose of the associated services like treating youth with mental health disorder and promoting recovery; and (5) the timeline associated with these delivered services (i.e., 2015–2017) (Babtisch et al. 2012). The outcomes of interest unique to this model were: hospitalizations, mental health consults, and length of hospital stay.

With regards to the literature around contextualizing mental health within Andersen's Model of Health Service Use, predisposing factors can include the cultural norm of mental health disorder within a family while contextual factors refer to the collective values and political opinions surrounding them (Babtisch et al. 2012). Culture plays a role in shaping parents' social perception of mental health problems and need for specialist services in youth (Flink et al. 2013). Families that express less stigmatized attitudes towards mental health services are more likely to refer their child for mental health consults (Villatoro and Aneshensel 2015). Conversely, parents' unfamiliarity with mental health system navigation is shown to delay mental health service use (Villatoro and Aneshensel 2015). Enabling factors, which pertain to the expense of mental health services (excluding those covered publicly), can affect hospitalization rates for mental health problems in addition to severity and intensity of required treatment (Babtisch et al. 2012; Zimmerman

et al. 2018). Longer duration of outpatient mental health treatment also has beneficial effects (e.g., fewer substance use problems and improved social functioning) among individuals with substance use disorders (Moos et al. 2001). Finally, length of hospital stay could be influenced in part by type of child mental health disorder, the presence of co-morbid mental and physical conditions, and stigma towards mental health disorder, which can interfere with hospital admittance time and consequently extend hospital stay (Jacobs et al. 2015; Koopmans et al. 2005; Mcbride et al. 2018; Zhang et al. 2011).

There is little information about how the family environment, particularly family functioning, might influence the use of mental health services. Most knowledge on proxy indicators of the family environment (e.g., medical adherence) and health service use in children focuses on children with physical health conditions (DeLambo et al. 2004; Lemanek et al. 2001). However, there is some literature that demonstrates poor medical adherence among children with a mental health disorder living in poor family functioning environments (e.g., poor problem solving and communication skills) characterized by parental mental health problems, substance abuse, child abuse, or neglect (Taddeo et al. 2008). Present research supports the presence of elevated caregiver expressed emotion as a potential factor related to a higher number of rehospitalizations and lengths of hospital stay (Marom et al. 2005; Wang et al. 2017). In fact, patients with schizophrenia experience greater levels of subclinical psychopathology (e.g., hostile and agitated behaviour) depending on their relatives' attitude (i.e., expressed emotion in affective style). (Woo et al. 2004). In addition, greater symptom severity and relapse rates are reported among youth and adults with bipolar disorder experiencing interpersonal (i.e., family and friend) difficulties (Siegel et al. 2016; Sullivan et al. 2013). Perceived family burden and expressed emotion are also elements that predict subsequent hospitalization in persons with a first psychotic episode and psychosis (Koutra et al. 2015). Lastly, parental excessive criticism increases the odds of relapse in persons with schizophrenia and bipolar disorder following hospital discharge (Miklowitz et al. 1988; Weiden et al. 2004). According to trends in the literature, families characterized by better family functioning use less health services and demonstrate better medical adherence (DiMatteo 2004; Glick et al. 2011; Leucht and Heres 2006).

Prior studies have typically focused on associations between family dynamics (e.g., family distress), family emotional environment (e.g., expressed emotion), and parenting behaviour (e.g., discipline style) on emotional symptoms in children (Dittman et al. 2011; Murphy and Flessner 2015). However, our study furthers the field in family functioning by considering modifiable contextual factors such as problem solving, communication, behaviour control, and other characteristics of family functioning that are amenable to intervention within a family-centred approach to care. Few studies have also examined associations between family functioning and child mental health disorder as measured using structured diagnostic interviews (Rao and Beidel 2009) whereas this study implemented a validated structured diagnostic tool to assess child mental health disorder (Sheehan et al. 2010). Our research endeavour attempts to accurately reflect the experiences of families of children with more serious mental health disorder, who use specialized mental health services. Previous self-reported measures of family functioning such as the child-reported Family Environment Scale (FES) and the child and parent-reported Family Relations Scale (FRS) also demonstrate self-serving bias and perception distortions (Hamilton and Carr 2016). While these tools demonstrate less than acceptable internal consistency reliability and validity (Hamilton and Carr 2016), our measure of family functioning (i.e., the McMaster Family Assessment Device), displays robust psychometric properties (e.g., good to excellent reliability and validity) (Hamilton and Carr 2016; Staccini et al. 2015).

In an effort to expand the research around family functioning, we conducted a nuanced examination of the association between family functioning and child mental health disorder and mental health service use. We sought to identify which domains of family functioning were associated with internalizing and externalizing disorders, past-year health professional consultations, hospitalizations, and length of hospital stay. We hypothesized that problem solving, communication, and behaviour control would be the most pertinent domains of family functioning to associate with mental health disorder and mental health service use. Specifically, better functioning in these domains would be inversely associated with child mental health disorder and use of mental health services.

Methods

Participants

One hundred parents and children who received mental health services from a clinical tertiary care facility were recruited. A power analysis was used to determine the required sample size using G*power. The inclusion criteria were: (1) children aged 4-17 years; (2) children that screened positive for at least one mental health disorder; and (3) children who were presently receiving mental health services from an inpatient or outpatient unit. No child less than 8 years was recruited into the study; thus, the recruited and analyzed sample included children aged 8–17 years. Parents with satisfactory English-language skills to complete the family functioning and mental health service use

Table 1 Six domains of the family assessment device and meanings

Domain	Item pairings	Meanings
Problem solving	FAD1 & FAD9	Less difficulty planning family activities and fewer problems making decisions.
Communication	FAD3 & FAD5	Ability to talk about sadness and discussing fears and concerns.
Behaviour control	FAD7 & FAD11	Good feelings in the family and getting along well together.
Affective involvement	FAD6 & FAD10	Expressing feelings to each other and making decisions on how to solve problems.
Affective responsiveness	FAD4 & FAD8	Individuals being accepted for what they are and feeling accepted for what they are.
Roles	FAD2 & FAD12	Turning to each other in times of crisis and confiding in each other.

questionnaires were included. Children who experienced psychotic episodes or another mental health problem that interfered with their capacity to complete the interview and questionnaires were excluded. In total, 259 eligible children were identified, 144 (56%) provided informed consent, and 100 (39%) participated in the study.

Procedure

Specific enlistment procedures were followed for recruiting potential participants from the clinical inpatient and outpatient mental health programs and have been published previously (Ferro et al. 2019). Briefly, during treatment breaks (e.g., at lunch), research staff explained the study procedure to children on the inpatient unit. Interested children gave research staff permission to contact their parents to obtain consent to participate in the study. When children were either discharged from hospital or during hospital visits by parents, research staff scheduled families to complete the study interview and questionnaires. Preceding the interviews and administration of questionnaires, research staff obtained written consent from parents and children. For the recruitment of children from the outpatient unit, research staff were granted access to clinic rosters. These clinic rosters included relevant contact information from families that: (1) agreed to be contacted; (2) were presently receiving mental health services from the outpatient unit; and (3) were age-appropriate to be included into the study. By telephone, research staff contacted families, introduced the study objectives and protocol, and scheduled a time for parents and children to complete the interview and questionnaires. Data collection for outpatients occurred at the research office. Responses to the interview and questionnaires were obtained and stored electronically on password-protected laptops. Ethical approval from the Hamilton Integrated Research and the University of Waterloo Research Ethics Boards was obtained.

Measures

McMaster Family Assessment Device

The General Functioning subscale of the McMaster Family Assessment Device (FAD) was used as the measure of family functioning (Byles et al. 1988). Following a four-point Likert scale (strongly agree to strongly disagree), parents were asked whether they agreed or disagreed to statements regarding their family. Possible scores on the General Functioning subscale ranged from 0 to 36. Raw scores on the FAD were summed for a total score. Higher scores represented better family functioning. The parent version of the FAD demonstrated acceptable internal consistency ($\alpha = 0.89$). Item pairings that represent the domains of the FAD—problem solving, communication, roles, affective responsiveness, affective involvement, and behaviour control are shown in Table 1.

Mini International Neuropsychiatric Interview for Children and Adolescents

The Mini International Neuropsychiatric Interview for Children and Adolescents (MINI-KID) is a structured diagnostic interview that screens children aged 6–17 years for mental health disorders in accordance with the Diagnostic and Statistical Manual of Mental Disorders-IV and International Classifications of Diseases 10. The MINI-KID has been validated against the Schedule for Affective Disorders and Schizophrenia for School Aged Children-Present and Lifetime Version (Sheehan et al. 2010). The MINI-KID is composed of diagnostic modules containing screening questions for each mental health disorder assessed. The most common mental health disorders (major depressive disorder, social phobia, specific phobia, generalized anxiety disorder, separation anxiety disorder, attention-deficit hyperactivity disorder, conduct disorder, and oppositional defiant disorder) were included in this study (Georgiades et al. 2019) The child-reported MINI-KID has shown strong psychometric properties (Duncan et al. 2018). Children aged 8–17 years completed the MINI-KID independently (i.e., without parental presence). The reference period for the assessment of disorders was 6 months. The questions posed in the interview aimed to determine patterns that were associated with child functional impairment, distress, and/or inability to pursue desired activities.

Mental health service use

Validated items from the Canadian Community Health Survey were used to measure mental health service use. Mental health service use was defined as hospitalizations and length of hospital stay versus access, which referred to health professional consultations. Specifically, the questions asked parents if their child had been hospitalized overnight or longer for problems with their emotions or mental health in the past 12 months, the number of times they had been hospitalized, the length of hospital stay for these problems, and if their child had seen, or talked on the telephone to any health professional about these problems in the past year.

Sociodemographic characteristics

The following sociodemographic information was obtained: parent's account of child age when the MINI-KID was administered, child sex (male or female), parent sex (male or female), parent age, marital status (married or common-law, widowed, divorced, or separated, and never married), education (some secondary school, completed secondary school, completed post-secondary school, completed graduate or professional school), parent and child immigrant status, which was defined as place of birth (born in Canada or not), and total yearly household income in $15,000 increments from <$15,000 to ≥$135 000.

Data Analyses

The General Functioning subscale of the FAD was designed to reflect the remaining six subscales/domains of the FAD (e.g., problem solving) (Byles et al. 1988). A correlational matrix was computed to examine which items were highly correlated to one another and subsequently, to which domains they corresponded (see Supplementary material). The next step in the analysis was to create composite domain variables, which involved summing item pairs. Confirmatory factor analysis was then performed on the six domains of the FAD based on the correlated pairings. Model fit was assessed through the following indices: χ^2 test, root mean square error of approximation (RMSEA), comparative fit index (CFI), and the Tucker-Lewis index (TLI). To address the issue of missing data, the complete cases were analyzed and then missing data were imputed using regression (i.e., missing at random) technique since child age predicted missing data on the child-reported MINI-KID. Mean imputation was used for child age, number of hospitalization times, length of hospital stay, and family functioning scores. Binary logistic regression examined parent-reported problem solving, communication, roles, affective responsiveness, affective involvement, and behaviour control on child mental health disorder and mental health service use. Confounders that could have skewed the association between family functioning, child mental health disorder, and mental health service use were child age and sex, mental health disorder, household income, and parent marital status and education (Kim et al. 2007) and were subsequently included in all models. To investigate number of hospitalizations and length of hospital stay, Poisson regression was used. Odds ratios (OR) and associated 95% confidence intervals (CI) were computed. Data were analyzed using Mplus 6.11 (factor analysis) and SAS 9.4 (regression modelling).

Results

Sample Characteristics

Sample characteristics are shown in Table 2. Children had a mean age of 14.5 (SD 2.2) years and over two-thirds (71.0%) were female. The majority of children received outpatient mental health services (62.0%). Major depressive disorder was the most common internalizing disorder, which affected the majority (72.0%) of children. The most common externalizing disorder was oppositional defiant disorder (34.0%). Parents had a mean age of 46.4 (SD 6.6) years and the majority (85.0%) were female. More than half were married and 52.0% completed post-secondary school. As shown in Tables 3, 41.0% of parents reported that their child was hospitalized overnight or longer for emotional or mental health problems. The majority of parents (80.0%) answered that their child had seen or talked to a health professional. Among children who had been hospitalized, one-third (34.1%) of parents reported that their child had been hospitalized more than once in the past year. The past-year average length of time spent in hospital for children was 14.0 (9.67) days.

Factor Analysis of the FAD

Confirmatory factor analysis of the items from the FAD was consistent with the correlation matrix. As shown in Table 4, factor loadings for each domain were strong ranging from 0.69 to 0.95 and statistically significant ($p < 0.001$ for all). Fit indices indicated that the data fit the model very well: χ^2 $2(39) = 49.13$ ($p = 0.128$); RMSEA = 0.051 (90% CI: 0.000, 0.091); CFI = 0.995 and TLI = 0.991.

Associations with Mental Health Disorder

Associations between domains of family functioning and internalizing and externalizing disorders are shown in Table 5. Higher scores on affective involvement were associated with greater odds of major depressive disorder [OR = 2.12 (1.01, 4.43)] and higher scores on problem

Table 2 Characteristics of children and parents

	n (%) *N* = 100
Sociodemographics (children)	
Age (years), mean (SD)	14.5 (2.2)
Female	71 (71.0)
Immigrant	5 (5.0)
Inpatient	38 (38.0)
Outpatient	62 (62.0)
Sociodemographics (parents)	
Age of parents (years), mean (SD)	46.4 (6.6)
Female	85 (85.0)
Immigrant	13 (13.0)
Marital Status	
Married or common law	61 (61.0)
Widowed, divorced, separated	31 (31.0)
Never married	8 (8.0)
Current education status	
Some secondary school	6 (6.0)
Completed secondary school	20 (20.0)
Completed post-secondary school	52 (52.0)
Completed graduate or professional school	14 (14.0)
Total yearly household income (before taxes)	
Less than $15 000	5 (5.0)
$15–29 999	10 (10.0)
$30–44 999	10 (10.0)
$45–59 999	14 (14.0)
$60–74 999	12 (12.0)
$75–89 999	12 (12.0)
$90–104 999	12 (12.0)
$105–119 999	6 (6.0)
$120–134 999	4 (4.0)
$135–149 999	5 (5.0)
$150–164 999	2 (2.0)
$165 000 or more	8 (8.0)
Mental health disorder (children)	
Major depressive disorder	72 (72.0)
Separation anxiety disorder	26 (26.0)
Combined phobia (social or specific)	62 (62.0)
Generalized anxiety disorder	61 (61.0)
Attention-deficit hyperactivity disorder	17 (17.0)
Conduct disorder	15 (15.0)
Oppositional defiant disorder	34 (34.0)

solving were associated with greater odds of social phobia [OR = 1.80 (1.09, 2.98)]. In contrast, higher scores on communication were associated with lower odds of GAD [OR = 0.55 (0.35, 0.84)]. Higher scores on behaviour control were associated with lower odds of social phobia and oppositional defiant disorder [OR = 0.48 (0.27, 0.86) and OR = 0.52 (0.32, 0.84), respectively] (Table 5).

Associations with Mental Health Service Use

Associations with mental health service use are shown in Table 6. Higher problem solving scores were associated with longer lengths of stay in hospital [OR = 1.07 (1.01, 1.12)] while higher scores on communication were associated with shorter hospital stays [OR = 0.93 (0.89, 0.97)]. No associations were found for any domains of family functioning and being hospitalized in the past year, number of past-year hospitalizations, or number of mental health professional consults (Table 6).

Discussion

Findings from this study showed that specific domains of family functioning—particularly problem solving and communication—could be associated with child mental health disorder and mental health service use in our clinical sample. These associations were limited to internalizing disorders (generalized anxiety disorder and social phobia) and past-year length of hospital stay. Interestingly, these associations were contrary to our hypotheses in some instances. Adolescent girls aged 12–19 years are more likely to be hospitalized for mental health disorder versus boys; hence, we have a representative sample consisting of predominately adolescent females with mental health disorder (Lalayants et al. 2017).

Higher scores on affective involvement and problem solving could be associated with increased odds of major depressive disorder and social phobia, respectively. These findings do not support our hypothesis. Affectively involved parents might provide emotionally distressed children support to feel more relaxed, at ease, and to potentially alleviate their associated symptoms of worthlessness or guilt (Bögels and Brechman-toussaint 2006; Kennedy 2008). However, we speculate that when affectively involved parents regularly problem solve for their child, this parental behaviour might interfere with the ability of their child to develop autonomy and decision-making skills during anxious and socially uncomfortable situations, which can affect the presence of internalizing symptoms (Bögels and Brechman-toussaint 2006). Hence, scoring high on these domains does not imply better family functioning.

There is also a possibility of reverse causality in that children with internalizing disorders might affect the capacity for their parents to be affectively involved and willing to problem solve on their behalf. In particular, children with major depressive disorder may need excessive reassurance from parents to help them navigate interpersonal situations; however, requiring this level of support might contribute to elevated parental conflict and emotional withdrawal (Brière et al. 2013). Consequently, parent's mood may be negatively

Table 3 Parent responses to children's mental health service use

Question	*n* (%)
Parents respond, "Yes" to their child being hospitalized overnight or longer	41 (41.0)
Parents respond, "Yes" to their child seeing or talking to a health professional	80 (80.0)
Parents respond, "one time" to the number of times their child was hospitalized	24 (24.0)
Parents respond, "two times or more" to the number of times their child was hospitalized	14 (14.0)
Parents respond to average length of time in days in hospital	14.0 (9.67) days

affected as a result of their child's complaints about their social inadequacy, making parents feel less close to and supportive of their child (i.e., relational erosion) during their reactions in social settings (Branje et al. 2010).

Lack of neighbourhood resources and family supports, presence of adverse childhood experiences, parental mental health stressors, and genetic predisposition to mental health disorder can also shape youth internalizing mental health problems (Swahn and Hayat 2018). Neighbourhood resources like community centres and parks may not have surrounded some of the families in our clinical sample; consequently, children may have had a deficiency in resources that were necessary for promoting their healthy development (Swahn and Hayat 2018). Moreover, children in our sample may have lacked family and professional supports, which significantly predicts child mental health problems (Cumella and Bellerby 2001). Children may have also experienced a number of adverse childhood experiences (e.g., abuse, neglect etc.) prior to participating in our study, which is associated with any current diagnosed mental health disorder (e.g., anxiety, depression). Lastly, they might have had a parent with a history of mental health disorder thus negatively affecting the extent of positive parental contact, communication abilities, and parental emotional support (Swahn and Hayat 2018).

Aligned with our hypothesis, higher scores on communication and behaviour control could be associated with lower odds of generalized anxiety disorder and social phobia, respectively. Prior evidence demonstrates that acutely depressed mothers are less emotionally available for their children and their lack of emotion and sensitivity (e.g., less interest in activities, less engagement in play) has the capacity to affect the development and well-being of children; specifically, their intellectual, emotional, and behavioural development (Kluczniok et al. 2015). We speculate an inverse relationship in light of the above evidence; in fact, the majority of mothers who participated in our clinical study may have been more engaged, sensitive, and communicative to the needs of their child and this could have served as a protective effect against odds of anxiety disorders (Peleg-popko and Klingman 2002). Furthermore, mothers may have modified their behaviour recognizing that their child had anxious tendencies and made a greater effort to develop expressive behaviour and good interpersonal relationships by demonstrating effective communication. We recognize that risk factors for child anxiety are not limited to the family environment and consider other variables such as: early-onset internalizing problems, co-morbid conduct disorder, low self-esteem, and predisposed traits for negative emotionality such as neuroticism and irritability (Moffitt et al. 2007).

Table 4 Factor analysis of the general functioning subscale of the FAD

Domain	Items	Factor loading (SE)
Problem solving	FAD1	0.69 (0.08)
	FAD9	0.82 (0.07)
Communication	FAD3	0.87 (0.06)
	FAD5	0.83 (0.06)
Behaviour control	FAD7	0.76 (0.07)
	FAD11	0.73 (0.08)
Affective involvement	FAD6	0.77 (0.05)
	FAD10	0.74 (0.06)
Affective responsiveness	FAD4	0.85 (0.03)
	FAD8	0.95 (0.02)
Roles	FAD2	0.93 (0.03)
	FAD12	0.84 (0.03)

All factor loadings were standardized and statistically significant ($p < 0.001$)

Higher scores on behaviour control might be associated with lower odds of ODD. Knowing this, parents in our sample may have implemented various management strategies; specifically, they could have used positive play strategies, reinforced positive behaviour, and avoided escalating conflict to help calm and reassure their child with ODD (Danforth 2016). There is also evidence to support the genetic component of ODD in addition to family-level factors like poor marital quality and paternal substance abuse (Boat and Wu 2015).

Also aligned with our hypothesis was that higher scores on communication might be associated with shorter lengths of stay in hospital for mental health problems during the past year. We surmise that children who have a more meaningful relationship with their parents regarding feeling accepted, abilities to confide, and getting along well in their family are more likely to be comfortable communicating their mental health concerns to their parents. Stronger

Table 5 Odds of child-reported internalizing and externalizing disorders by FAD domain

	Domains					
Mental health disorder	Problem solving	Communication	Behaviour control	Affective responsiveness	Affective involvement	Roles
Major depressive disorder	1.19 (0.69, 2.05)	0.90 (0.56, 1.45)	0.83 (0.44, 1.53)	0.96 (0.57, 1.60)	2.12 (1.01, 4.43)	0.84 (0.47, 1.53)
Generalized anxiety disorder	1.36 (0.84, 2.22)	0.55 (0.35, 0.84)	0.88 (0.53, 1.45)	0.80 (0.49, 1.30)	1.25 (0.63, 2.47)	0.96 (0.55, 1.68)
Separation anxiety disorder	1.28 (0.80, 2.05)	1.18 (0.78, 1.79)	0.62 (0.38, 1.00)	0.83 (0.52, 1.32)	1.79 (0.89, 3.61)	1.09 (0.64, 1.86)
Social phobia	1.80 (1.09, 2.98)	1.06 (0.71, 1.57)	0.48 (0.27, 0.86)	0.91 (0.57, 1.44)	1.19 (0.62, 2.29)	0.72 (0.42, 1.25)
Specific phobia	1.19 (0.75, 1.88)	0.89 (0.58, 1.37)	1.21 (0.74, 1.97)	0.83 (0.54, 1.26)	1.55 (0.83, 2.89)	0.76 (0.46, 1.26)
Attention-deficit hyperactivity disorder	1.16 (0.68, 1.96)	0.91 (0.57, 1.45)	0.61 (0.36, 1.04)	0.97 (0.59, 1.58)	1.85 (0.84, 4.08)	0.72 (0.39, 1.32)
Oppositional defiant disorder	0.87 (0.56, 1.35)	1.15 (0.78, 1.70)	0.52 (0.32, 0.84)	0.78 (0.51, 1.19)	1.68 (0.88, 3.22)	0.90 (0.55, 1.47)
Conduct disorder	0.95 (0.57, 1.61)	1.22 (0.76, 1.97)	0.65 (0.38, 1.14)	0.86 (0.50, 1.48)	1.49 (0.68, 3.29)	0.90 (0.47, 1.71)

Results are OR (95% CI), adjusted for child age and sex, parent marital status, and household income

bonds, better communication, and lack of conflict between children and their parents are linked to decreased lengths of hospital stay (Stewart et al. 2014). In addition, families characterized by better family functioning are more likely to actively participate in decision-making around treatments for hospitalized children that could decrease lengths of hospital stays (Gruenberg et al. 2006). Moreover, parents of children with a mental health disorder who come from better family functioning environments may respond to the mental health needs of their child more readily. These responsive parents may be more likely to ensure that their child receives timely mental health services; thus promoting more favourable outcome trajectories and potentially reducing length of time in hospital.

Contrary to our hypothesis, higher scores on problem solving might be associated with longer stays in hospital. Speculatively, it is possible that the subset of parents who reported no problems making decisions or difficulty planning family activities adopted an authoritarian parenting style, in which decisions are made without the input or involvement of other family members. In this context, children make feel a lack of worth or become overwhelmed when faced with making decisions independently or tasks that require troubleshooting (Bögels and Brechman-toussaint 2006). Children may have difficulty in meeting challenges and adapting positively to stressful situations as evidence suggests that limited decision-making is associated with childhood anxiety (Bögels and Brechman-toussaint 2006). As a result, this family environment may prevent children from making adequate progress in their treatment programming and thus, delay hospital discharge. However, length of stay can also be extended when the mental condition of the child is increasingly severe and characterized by multiple complications requiring greater treatment, assistance, and clinical documentation from hospital staff (Mcbride et al. 2018). Lack of readiness to be discharged from hospital and/or an appropriate discharge location (e.g., access to community care) can also lengthen hospital stay (Waring et al. 2014).

Alternatively, it is possible that parents who reported higher problem solving scores recognize that optimal care for their child requires either short or extended hospitalization and that communication with their child and health professional ensures that the length of stay is appropriate for promoting the best possible outcomes (Ygge and Arnetz 2004). Families that are more competent and engaged in their child's mental health care may receive greater support from clinic staff who are willing to keep the child in hospital longer, because they have fostered a collaborative relationship rooted in ongoing dialogue surrounding treatment decision-making with parents (Aarthun et al. 2019; Ygge and Arnetz 2004).

Table 6 Odds of mental health service use by FAD domain

Domains	Hospitalized (yes/no)	No. of hospitalizations	Length of stay in hospital	Health professional consults (yes/no)
Problem solving	0.82 (0.51, 1.33)	0.97 (0.84, 1.12)	1.07 (1.01, 1.12)	1.07 (0.64, 1.79)
Communication	0.90 (0.59, 1.35)	0.98 (0.86, 1.11)	0.93 (0.89, 0.97)	0.79 (0.49, 1.25)
Behaviour control	0.83 (0.51, 1.36)	1.00 (0.85, 1.16)	0.95 (0.90, 1.00)	0.92 (0.52, 1.61)
Affective responsiveness	0.82 (0.49, 1.38)	1.02 (0.89, 1.17)	1.00 (0.96, 1.05)	1.04 (0.58, 1.89)
Affective involvement	1.37 (0.67, 2.80)	0.99 (0.81, 1.22)	1.03 (0.96, 1.11)	0.80 (0.37, 1.72)
Roles	0.72 (0.40, 1.29)	0.99 (0.85, 1.16)	0.97 (0.92, 1.03)	0.84 (0.43, 1.62)

Results are OR (95% CI), adjusted for child age and sex, mental health disorder, parent marital status, and household income

Limitations

Findings should be considered in the following context. First, the recruitment of families from a clinical paediatric hospital and cross-sectional study design limited the generalizability of findings and prevented any causal inferences regarding the association between family functioning, child mental health disorder, and mental health service use, respectively. Likewise, findings may not generalize to families of children with other mental health disorders excluded in this study or those of lower socioeconomic status. Our study had a low participation rate, which is a barrier in mental health research and medical research in general in that it decreases the sample size, limits generalizability, and increases the chance of making a type II error (Liu and Li 2018; Woodall et al. 2010). Second, measures of mental health service use were based on parent report and thus misclassification may have been possible. Third, other family characteristics, such as culture, were not measured in this study and can influence time spent in hospital and delay hospital admittance time (Zhang et al. 2011). Fourth, severity and complications associated with childhood mental health disorder, as well as health professional experience have been shown to influence hospital stay (Mcbride et al. 2018), but were not measured in this study.

The adoption of family-centred approaches to mental health services for children, particularly in clinical inpatient settings, was supported by this study and should remain a priority within the health system, particularly for primary care providers who act as the first point of entry into the health system. Evidence suggests that family-centred care is associated with fewer severe symptoms and improved functional outcomes in children with behavioural problems (Owens et al. 2005), better psychological well-being in parents of children with Down syndrome (Riper 1999), fewer perceived unmet needs among families (Denboba et al. 2006), fewer instances of hospitalization from chronic effects of asthma (Clark et al. 2000), and greater access to specialist services (Denboba et al. 2006). Furthermore, supports that concentrate on aspects of family functioning like encouraging positive attitudes (e.g., affective support, empathy, strong verbal communication etc.) have positive effects on recovery, reduced readmission and relapse rates, and better social functioning among adults with schizophrenia. Therefore, primary care providers could prioritize providing needed supports to foster better family functioning to improve the well-being of children with a mental health disorder and their families.

From a research perspective, findings should be replicated using larger samples, longitudinal study designs, and a more comprehensive examination of covariates that could potentially confound the interrelationships among family functioning and child mental health, and associated service use. Research should thus aim to elucidate the interrelationships between problem solving and affective involvement in order to aid health professionals and researchers develop and evaluate effective family-based interventions to better support children with a mental health disorder and their families.

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Author Contributions I.I.O.: conducted the data analysis and wrote the initial manuscript. C.P. and S.M.: provided guidance on analyses and edited the paper for intellectual content. M.A.F.: designed and executed the study, collaborated in the writing of the paper, and edited the paper for intellectual content.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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