

Assessing for Mood and Anxiety Disorders in Parents of Clinically-Referred Children: Laying the Foundation for a Family-Based Approach to Mental Health in Singapore

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Abstract

Introduction: Family history of psychopathology is a risk factor for mood and anxiety disorders in children, but little is known about rates of parental psychopathology among treatment-seeking youth with affective disorders in the Asia Pacific region. This study examined patterns of emotional and behavioural problems in parents of clinically-referred youth in Singapore. We hypothesised that parents would have higher rates of affective disorders compared to the Singapore national prevalence rate of 12%. **Materials and Methods:** In this cross-sectional study, 47 families were recruited from affective disorders and community-based psychiatry programmes run by a tertiary child psychiatry clinic. All children had a confirmed primary clinical diagnosis of depression or an anxiety disorder. Parents completed the Mini International Neuropsychiatric Interview (MINI) to assess for lifetime mood and anxiety disorders. They also completed the Adult Self Report (ASR) and Adult Behavior Checklist (ABCL) to assess current internalising and externalising symptoms. **Results:** Consistent with our hypothesis, 38.5% of mothers and 10.5% of fathers reported a lifetime mood or anxiety disorder. Nearly 1/3 of mothers had clinical/subclinical scores on current internalising and externalising problems. A similar pattern was found for internalising problems among fathers, with a slightly lower rate of clinical/subclinical externalising problems. **Conclusion:** Our findings are consistent with previous overseas studies showing elevated rates of affective disorders among parents—particularly mothers—of children seeking outpatient psychiatric care. Routine screening in this population may help to close the current treatment gap for adults with mood and anxiety disorders.

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Key words: Affective disorders, Depression, Family history

Introduction

Background

Parental psychopathology is a documented risk factor for mood disorders in children^{1,2} and it may be due to a combination of genetic vulnerabilities and psychosocial factors such as parenting style and attachment.^{3,4} While there is evidence for the heritability of mood and anxiety

disorders, parental psychopathology can also profoundly affect the environment in which the child is raised.^{2,5} Epigenetic pathways are involved in the long lasting effects of maternal psychopathology and child outcomes.⁶ In addition, children with depression and anxiety disorders may be more likely to elicit certain parenting styles, such as overprotection, in turn creating an environment that

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maintains affective symptoms.⁷ Children's symptoms can also become an increased risk and/or perpetuating factor for psychopathology in parents.⁸

The intergenerational association between maternal and offspring depression and anxiety persists well into adulthood.^{6,9} In a 30-year follow-up study of children of parents with depression, it was found that they had a threefold increased risk for depression and anxiety when compared to children whose parents did not have depression.¹⁰ Maternal depression and anxiety measured in late adolescence was consistently associated with offspring depression and anxiety across daughters' transition to adulthood.⁶ Recent clinical data has suggested that treatment of maternal depression can reduce the number of psychiatric diagnoses and problem behaviours in their children.¹¹ For example, in a United States (US) study of 168 mothers with major depression who were treated with 9 sessions of interpersonal or supportive psychotherapy, improvement in mothers' depressive symptoms after psychotherapy predicted an improvement in their children's functioning 3 to 6 months later, an effect that was independent of the youth's treatment.¹¹ Taken together, these studies suggest that a family-based approach to assessment and treatment of mental health conditions is warranted. However, screening family members of clinically-referred youth is not routinely done in clinical practice.

To our knowledge, no studies have been conducted on the rates of psychopathology in parents seeking psychiatric evaluation for their children in an Asian setting. Data from overseas studies indicate that parents of treatment-seeking youth have high rates of internalising conditions. In a US study, Ferro et al¹² found that among mothers who brought their children to paediatric psychiatry clinics for depression and anxiety, 14% screened positive for current major depression, 17% for panic disorder, and 17% for generalised anxiety disorder. In a United Kingdom sample, Cooper et al¹³ found that 57% of mothers and 33% of fathers of children with anxiety disorders had lifetime major depressive disorder, while 68% of mothers and 45% of fathers had lifetime anxiety disorders. Middeldorp et al¹⁴ found that among parents of children who presented for outpatient psychiatric services in the Netherlands, approximately 20% of mothers and fathers had elevated scores on internalising problems. In a study by Swartz et al,¹⁵ over 60% of mothers seeking outpatient psychiatric care for their children met criteria for Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) mood and anxiety disorders. Vidair and colleagues¹⁶ examined rates of parental psychiatric symptoms in a sample of 848 youth aged 6 to 17 years who were assessed at a tertiary outpatient psychiatric clinic in the US. Results indicated that over 18% of mothers and fathers experienced elevated psychiatric symptoms. Maternal and paternal symptoms

were significantly associated with the severity of the child internalising and externalising symptoms. The investigators proposed that screening parents for psychopathology should be part of a child's psychiatric evaluation. A similar multi-informant approach has also been advocated by Hudziak and colleagues.¹⁷

Study Aims and Hypotheses

To date, there have been no studies using a family-based approach to examine patterns of parental mood and anxiety disorders among clinically-referred youth in Singapore. According to the Singapore Mental Health Study (SMHS), approximately 12% of the population had at least 1 lifetime affective, anxiety, or alcohol use disorder.¹⁸ Data from the SMHS also showed that the lifetime prevalence of major depressive disorder was higher among women (7.2%) than men (4.3%).¹⁹ However, an estimated 59.6% of people with major depressive disorder and 56.5% of those with generalised anxiety disorder did not seek medical treatment for their conditions,²⁰ indicating a large treatment gap for adults with mood and anxiety disorders in Singapore.

It is possible that parents are more comfortable seeking mental healthcare for their children than they are seeking psychiatric care for themselves. Hence, assessment and referral of parents of treatment-seeking youth when presenting at the child outpatient clinic may provide another route to diagnosis and treatment for those with mental health issues who might otherwise remain unidentified and untreated. This study aimed to characterise patterns of psychiatric diagnosis and mental health problems among parents of clinically-referred youth with mood and anxiety disorders in Singapore with the goal of informing future family-based assessment and intervention strategies.

Building on previous findings regarding the intergenerational transmission of depression and anxiety, we hypothesised that parents of youth with mood and anxiety disorders would: 1) have higher rates of lifetime mental health disorders compared to the national prevalence rate of 12%, and 2) show elevations on current multi-informant ratings of internalising and externalising problems, as well as mood and anxiety symptoms.

Materials and Methods

Study Design and Setting

The study design was cross-sectional in nature. We enrolled 47 children, aged 6 to 19 years of age from a public outpatient subspecialty clinic serving children with mood and anxiety disorders and 2 community outreach teams based at the Department of Child and Adolescent Psychiatry at the Institute of Mental Health (IMH) in Singapore.²¹ The outpatient psychiatry clinic is a tertiary-level service that is organised into 3 subspecialty clinics. The Mood and Anxiety Clinic offers medication management by psychiatrists, in

addition to cognitive behavioural therapy and family therapy provided by clinical psychologists and social workers. The community-based multidisciplinary teams consist of psychiatrists, social workers, and psychologists who provide assessment, consultation-liaison, and psychotherapy services to schools for children and adolescents with suspected mental health conditions.²²

Participants and Procedures

Recruitment was based on the inclusion and exclusion criteria described in Table 1 pertaining to child participants. Of the 47 children, 3 failed to complete the study procedures and were therefore excluded from analysis. The 44 identified participants and their parents completed structured clinical interviews^{23,24} and validated multi-informant rating scales²⁵⁻²⁸ to assess the presence of lifetime DSM-IV diagnoses and current mental health/behavioural problems. Figure 1 shows the recruitment flowchart.

Procedures

All study procedures took place during 1 to 2 study visits, which included obtaining vital signs, body mass index (BMI), and child medical/psychiatric history, administration of structured clinical interviews regarding the child (Diagnostic Interview Schedule for Children IV; DISC-IV)²⁴ and parents (Mini-International Neuropsychiatric Interview-IV; MINI-IV),²³ and administration of multi-informant rating scales assessing current parent symptoms (Adult Self-Report; ASR, Adult Behavior Checklist; ABCL).^{25,28}

To minimise burden on participants and their families, we attempted to complete all study procedures during 1 study visit. If both parents were not available, we allowed the recruitment of the child and 1 parent. Participants were also given the option of bringing home the rating scales for completion to reduce the amount of time spent during the study visit. To cater for the Chinese-speaking families, Mandarin versions of the structured clinical interviews and rating scales were also administered, when necessary. A

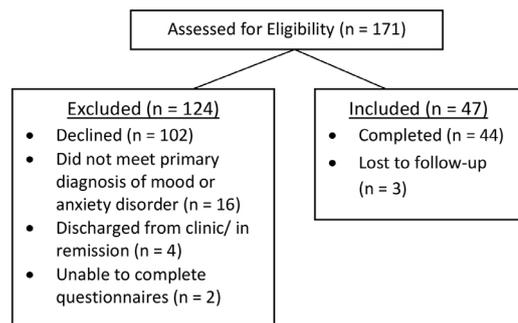


Fig. 1. Recruitment flow chart.

total of 5 parents completed the rating scales and interviews in Mandarin.

Following completion of the study assessments, all participants and their caregivers were offered an optional review of their results, general psycho-education about mood and/or anxiety disorders, and possible treatment options. Parents with prominent symptoms who were not already being treated were referred to IMH psychiatry or community mental health services for further evaluation and treatment. All of the study procedures were on voluntary basis and were approved by the National Healthcare Group Domain Specific Institutional Review Board.

Parent and Child Assessments

For child diagnostic assessments, we used the National Institute of Mental Health DISC-IV, a well validated structured parent interview designed to assess mental disorders in youth based on DSM-IV criteria.²⁴ The DISC-IV has been widely used to assess inclusion criteria in research studies involving children and adolescents. Our research team used the DISC-IV in several prior studies of the local population.²⁹⁻³¹ For adult interviews, we used the MINI-IV, a reliable and valid semi-structured interview designed to assess the DSM-IV disorders most commonly encountered in psychiatric outpatients.^{23,24} The Principal Investigator had extensive experience using the MINI-IV in prior studies of adults in the US³² and Singapore.^{33,34}

For the multi-informant rating scales, we used the Achenbach System of Empirically Based Assessments (ASEBA), a comprehensive system for assessing adaptive and maladaptive functioning in a cross-cultural context.²⁵ We used 2 adult rating scales: the spouse-report ABCL and the self-report ASR.²⁸ Subscales of these measures assess broadband internalising and externalising symptoms, behavioural problem domains, and symptoms corresponding to DSM-IV diagnoses. Our research team participated in the cross-cultural validation of the ASEBA scales and we have used them in several studies of the local population.^{26, 35-38} The thresholds for clinical and subclinical scores for the ABCL and ASR correspond to the 97th and 93rd percentiles, respectively, of men and women in the general population.

Table 1. Inclusion/Exclusion Criteria for Children

Inclusion	Exclusion
• 6 to 19 years of age	• Unstable medical condition
• English- or Mandarin-speaking	• Severe psychiatric disorders (i.e. ASD, schizophrenia, other psychotic disorders)
• Primary clinical diagnosis of mood and/or anxiety disorder	• Current active suicidal and/or homicidal ideation with plan/intent
• Willing and able to complete questionnaires	• Unable to comprehend rating scales
	• Borderline personality traits

ASD: Autism spectrum disorder

Results

Participant Characteristics

Out of the 44 families, there were 5 child-father pairs, 25 child-mother pairs and 14 child-father-mother triads. All 44 children had a clinical DSM-IV diagnosis of either depression (36.4%) and/or anxiety disorders (63.6%). Of these 44 patients, 38.6% (n = 17) were male and 61.4% (n = 27) were female. Ethnicity was 84.1% (n = 37) Chinese, 6.8% (n = 3) Indian and 9.1% (n = 4) other race/ethnicity. The age (mean, SD) of child, father, and mother participants were 14.8 (3.4), 49.4 (5.9), and 46.9 (5.4) years, respectively. Other child demographic and clinical characteristics can be found in Table 2.

Parental Mental Health Disorders

Tables 3 to 5 show the prevalence of lifetime mood and anxiety disorders and current mental health symptoms among parents. Consistent with our hypothesis, 38.5% of mothers and 10.5% of fathers met diagnostic criteria for a lifetime mental health disorder as assessed by the Mini-International Neuropsychiatric Interview-IV (MINI-IV) (see Table 3). Several of the parents also reported comorbid depressive and anxiety disorders. Comorbid depression and agoraphobia was found in 2.6% of mothers, comorbid depression and obsessive-compulsive disorder in 2.6% of mothers, comorbid depression and social anxiety disorder in 2.6% of mothers. Comorbid depression, panic disorder, and mood disorder with psychotic features was found in 2.6% of fathers. Comorbid depression, panic disorder, agoraphobia, and social phobia was found in 2.6% of mothers.

Parental Internalising, Externalising and Affective Symptoms Self-Report

For internalising symptoms, 27% of mothers and 31.6% of fathers scored in the clinical or subclinical range. For externalising symptoms, 32.4% of mothers and 15.8% of fathers scored in the clinical or subclinical range. For depressive problems, 18.2% of mothers and 9.4% of fathers scored in the clinical and subclinical range. For anxiety problems, 9% of mothers and 11.6% of fathers scored in the clinical and subclinical range. For suicidal ideation, 17.9% (n = 7) of mothers and 5.2% of fathers (n = 1) answered “Sometimes True” to the item “I think about killing myself.” Table 4 presents ASEBA subscale scores for self-reported internalising, externalising, syndrome scales, and DSM-oriented scales.

Spouse-Report

For internalising symptoms, 31.6% of mothers and 23.7% of fathers scored in the clinical or subclinical range. For externalising symptoms, 21% of mothers and 18.4% of fathers scored in the clinical or subclinical range. For

Table 2. Demographic and Clinical Characteristics of Child Participants

Demographic Characteristics	
Ethnicity of child (n, %)	
Chinese	37 (84.1)
Indian	3 (6.8)
Others	4 (9.1)
Gender of child (n, %)	
Male	17 (38.6)
Female	27 (61.4)
Religion (n, %)	
Buddhist/Taoist	18 (40.9)
Christian/Catholic	19 (43.2)
Muslim	2 (4.5)
No religion	12 (27.3)
Education level of child (n, %)	
Primary	11 (25.0)
Secondary	19 (43.2)
Polytechnic or junior college	12 (27.3)
Not in school	2 (4.5)
Clinical Characteristics	
Maternal medication use during pregnancy (n, %)	
None	23 (52.3)
Stimulants	3 (6.8)
Antidepressants	14 (31.8)
Others	3 (6.8)
Child's psychiatric diagnosis (n, %)	
Major depressive disorder	16 (36.4)
Panic disorder	5 (11.4)
Social anxiety disorder	6 (13.6)
Generalised anxiety disorder	7 (15.9)
Obsessive-compulsive disorder	6 (13.6)
Separation anxiety disorder	1 (2.3)
Selective mutism	2 (4.5)
Specific phobia	1 (2.3)
Past history of suicide attempt (n, %)	7 (15.9)
Age of onset (M, SD)	11.9 (3.6)
Children's Global Assessment Scale score (M, SD)	62.9 (9.1)
Duration of illness in years (M, SD)	2.7 (0.6)

depressive problems, 11.4% of mothers and 4.7% of fathers scored in the clinical and subclinical range. For anxiety problems, 9.1% of mothers and 7% of fathers scored in the clinical and subclinical range. Table 5 presents ASEBA subscale scores for spouse-reported internalising, externalising, syndrome scales, and DSM-oriented scales. For the ABCL and the ASR, internalising and externalising problems scores were considered clinical if they were above the 90th percentile and subclinical if they were between the 84th to 90th percentiles.

Table 3. Parent Lifetime MINI-IV Diagnoses

	Father (n = 19)	Mother (n = 39)
MINI-IV diagnosis (n, %)		
Major depressive disorder	0 (0)	9 (23.1)
Panic disorder	0 (0)	1 (2.6)
Social anxiety disorder	0 (0)	1 (2.6)
Bipolar disorder	0 (0)	0 (0)
Post-traumatic stress disorder	0 (0)	0 (0)
Agoraphobia	1 (5.3)	0 (0)
Obsessive-compulsive disorder	0 (0)	0 (0)
Generalised anxiety disorder	0 (0)	0 (0)
Any mood or anxiety disorder	2 (10.5)	15 (38.5)

MINI-IV: Mini-International Neuropsychiatric Interview-IV

Table 4. Mental Health Symptoms among Parents (Self-Report)

	Mother		Father	
	Clinical	Subclinical	Clinical	Subclinical
Syndrome scores (n, %)				
Anxious/depressed	5 (11.4)	2 (4.5)	1 (2.3)	2 (4.7)
Withdrawn	4 (9.1)	4 (9.1)	2 (4.7)	0 (0)
Somatic complaints	1 (2.3)	6 (13.6)	2 (4.7)	2 (4.7)
Thought problems	1 (2.3)	3 (6.8)	1 (2.3)	2 (4.7)
Attention problems	2 (4.5)	3 (6.8)	3 (7.0)	0 (0)
Aggressive problems	1 (2.3)	6 (13.6)	2 (4.7)	0 (0)
Rule-breaking behaviour	0 (0)	1 (2.3)	1 (2.3)	0 (0)
Intrusive	0 (0)	1 (2.3)	1 (2.3)	0 (0)
Internalising problems	7 (15.9)	3 (6.8)	5 (11.6)	1 (2.3)
Externalising problems	7 (15.9)	5 (11.4)	2 (4.7)	1 (2.3)
Total problems	9 (20.5)	2 (4.5)	3 (7.0)	1 (2.3)
DSM-oriented scale (n, %)				
Depressive problems	3 (6.8)	5 (11.4)	2 (4.7)	2 (4.7)
Anxiety problems	2 (4.5)	2 (4.5)	0 (0)	5 (11.6)
Somatic problems	1 (2.3)	5 (11.4)	1 (2.3)	2 (4.7)
Avoidant personality problems	2 (4.5)	5 (11.4)	0 (0)	3 (7.0)
ADHD problems	3 (6.8)	1 (2.3)	1 (2.3)	1 (2.3)
Antisocial personality problems	0 (0)	0 (0)	0 (0)	4 (9.3)

ADHD: Attention deficit hyperactivity disorder; DSM: Diagnostic and Statistical Manual of Mental Disorders

Table 5. Mental Health Symptoms among Parents (Spouse-Report)

	Mother		Father	
	Clinical	Subclinical	Clinical	Subclinical
Syndrome scores (n, %)				
Anxious/depressed	2 (4.5)	3 (6.8)	1 (2.3)	2 (4.7)
Withdrawn	3 (6.8)	2 (4.5)	3 (7.0)	4 (9.3)
Somatic complaints	2 (4.5)	1 (2.3)	0 (0)	5 (11.6)
Thought problems	1 (2.3)	1 (2.3)	2 (4.7)	2 (4.7)
Attention problems	1 (2.3)	2 (4.5)	3 (7.0)	1 (2.3)
Aggressive problems	1 (2.3)	2 (4.5)	2 (4.7)	3 (7.0)
Rule-breaking behaviour	0 (0)	0 (0)	2 (4.7)	1 (2.3)
Intrusive	0 (0)	0 (0)	1 (2.3)	2 (4.7)
Internalising problems	5 (11.4)	1 (2.3)	2 (4.7)	7 (16.3)
Externalising problems	1 (2.3)	3 (6.8)	5 (11.6)	2 (4.7)
Total problems	4 (9.1)	2 (4.5)	5 (11.6)	2 (4.7)
DSM-oriented scale (n, %)				
Depressive problems	4 (9.1)	1 (2.3)	0 (0)	2 (4.7)
Anxiety problems	0 (0)	4 (9.1)	0 (0)	3 (7.0)
Somatic problems	3 (6.8)	0 (0)	2 (4.7)	3 (7.0)
Avoidant personality problems	3 (6.8)	1 (2.3)	3 (7.0)	3 (7.0)
ADHD problems	1 (2.3)	0 (0)	3 (7.0)	3 (7.0)
Antisocial personality problems	0 (0)	0 (0)	2 (4.7)	4 (9.3)

ADHD: Attention deficit hyperactivity disorder; DSM: Diagnostic and Statistical Manual of Mental Disorders

Discussion

To our knowledge, this is the first study in the Asia Pacific region to document rates of psychiatric symptoms among parents of children attending an outpatient psychiatric clinic. Consistent with our hypothesis, 38.5% of mothers and 10.5% of fathers met diagnostic criteria for a lifetime mental health disorder as assessed by the MINI-IV. A higher percentage of mothers had greater tendency towards internalising problems while a higher percentage of fathers had greater tendency towards externalising problems. Our findings are consistent with previous overseas studies that reported a high rate of depression and anxiety among

parents of children seeking outpatient psychiatric care.¹²⁻¹⁶ For example, Ferro et al found that 31% of mothers of children with depression met diagnostic criteria for a current psychiatric disorder.¹² Similarly, Swartz et al found that 35% and 42% of mothers of children presenting for psychiatric evaluation met diagnostic criteria for depression and anxiety respectively.¹⁵ In addition, our findings that 31.6% of mothers and 23.7% of fathers scored in the clinical or subclinical range for internalising symptoms are in keeping with Middeldorp et al who found that 20% of both mothers and fathers of children presenting for psychiatric evaluation displayed such symptoms,¹⁴ and with Vidair et al who found that 18.8% of mothers and 18.4% of fathers reported elevated internalising symptoms.¹⁶

Local data to explain the high rate of depression and anxiety among parents are relatively limited. In the adult population in Singapore, depression has been associated with being a single mother,³⁹ and having poorer quality of life with respect to physical and mental health functioning.⁴⁰ Generalised anxiety disorder has been associated with increased psychiatric comorbidity, history of threatening life events, and increased odds of being divorced.⁴¹ These factors may contribute to poor parenting and adverse family environments. Maladaptive ruminations⁴² and feelings of shame in depression⁴³ may also contribute to a greater tendency towards internalising problems among adult Singaporeans.

Some strengths and limitations of our study should be highlighted. Strengths include the use of a multi-informant approach to gather information on psychiatric symptoms among parents, use of validated rating scales and structured diagnostic interviews, and administration of study assessments by highly trained research staff. These methods allow for a more accurate and reliable understanding of psychopathology in our sample. Our study also has a number of limitations. First, our findings are generalisable only to a self-selected group of parents bringing their children for treatment at an outpatient psychiatric clinic and may not be generalisable to other groups of fathers or mothers. Second, 60% of eligible participants declined participation in our study. It is unknown whether they differ in demographic and clinical characteristics to the participants who were recruited. The fact that only 45% of fathers and 89% of mothers were assessed could also have introduced a bias into the findings. The lower rate of participation by fathers limits the extent to which our results reflect the true rates of affective disorders in this group. Furthermore, men with depression are less likely to seek help and more likely to attempt suicide with high perceived lethality.⁴⁴ It is quite possible that fathers who were depressed or anxious would be less likely to participate in a study evaluating their emotional and behavioural health. Nevertheless, our findings

are consistent with previous literature demonstrating higher rates of psychopathology among parents of children attending outpatient psychiatric clinics. In addition, a control group (parents of children without psychiatric illnesses) was not included. Due to the ethnic composition of our study sample, no Malay families were included. Future studies should include a larger sample to reflect the ethnic composition in Singapore more accurately. Finally, there were also lacking demographic details (aside from parent age and ethnicity), so we would be unable to examine the extent to which these are associated with parental psychopathology, and we were unable to examine the temporal relationships and strength of association between child and parent symptoms (i.e. duration and severity). Finally, due to the cross-sectional study design, we cannot assess the causative relationship between child and parental psychopathology.

Our study also highlights several possibilities for future research. First, prior research has demonstrated the negative physical⁴⁵ and mental health⁴⁶ consequences that parental smoking may have on children. Hence, future studies may be useful to elucidate the role of parental smoking and alcohol misuse and how this may mediate the intergenerational transmission of psychopathology. Second, information regarding parents' demographics (e.g. education, occupation, family income), psychiatric history and treatment received may also help identify treatment gaps. Among Singaporean adults, depression and anxiety have been associated with unemployment,⁴⁷ chronic diseases⁴⁸ and caregiving for older parents with chronic diseases such as stroke.⁴⁹ Further information on the causes of depression and anxiety in parents whose children are receiving psychiatric treatment will also help with designing appropriate interventions for these parents.

Conclusion

The data presented here may be seen as an important first step in designing appropriate family-based prevention and intervention strategies for children and families in Singapore. Our preliminary results indicate that, consistent with findings from overseas studies, parents (particularly mothers) of clinically-referred children with mood and anxiety disorders have higher lifetime rates of affective disorders as compared to adults in the general population. They are also at risk for clinically significant elevations in internalising and externalising symptoms, which may impact their current functioning and ability to manage their child's illness. These findings highlight an increasing need for coordinated care to identify and treat mental illnesses such as depression and anxiety.⁵⁰ Research on Singaporean adults with anxiety and depression demonstrated that poor self-rated mental health status predicted the tendency of

patients to seek help.⁵¹ Child and adolescent psychiatrists are in a strong position to encourage parents to be screened for anxiety and depression. Advances in technology, including the use of smart phone applications that focus on mental health, may be useful in the early identification and management of depression.^{52,53} Improving the child's environment through treatment of parental mental health problems is likely to have positive outcomes on child symptoms and functioning and vice versa. In the long term, identification of modifiable environmental risk factors may also allow for family-based environmental interventions.

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