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# Chapter 8 Childhood Mental and Developmental Disorders

James G Scott, Cathrine Mihalopoulos, Holly E Erskine, Jacqueline Roberts, and Atif Rahman.

Author Information

**Authors**

James G Scott, Cathrine Mihalopoulos, Holly E Erskine, Jacqueline Roberts, and Atif Rahman.

**Affiliations**

Corresponding author: James G. Scott, The University of Queensland Centre for Clinical Research, Queensland; Royal Brisbane and Women's Hospital, Queensland, Australia;Email: james.scott@health.qld.gov.au.

## Introduction

Childhood mental and developmental disorders encompass neurodevelopmental, emotional, and behavioral disorders that have broad and serious adverse impacts on psychological and social well-being. Children with these disorders require significant additional support from families and educational systems; the disorders frequently persist into adulthood (Nevo and Manassis 2009; Polanczyk and Rohde 2007; Shaw and others 2012). These children are more likely to experience a compromised developmental trajectory, with increased need for medical and disability services, as well as increased risk of contact with law enforcement agencies (Fergusson, Horwood, and Lynskey 1993).

### Childhood Mental and Behavioral Disorders

This chapter limits the discussion to the following five conditions: childhood anxiety disorders, attention-deficit hyperactivity disorder (ADHD), conduct disorder, autism, and intellectual disability (intellectual developmental disorder).

- *Anxiety disorders* are characterized by excessive or inappropriate fear, with associated behavioral disturbances that impair functioning (APA 2013). Children with anxiety disorders have clinical symptoms, such as excessive anxiety; severe physiological anxiety symptoms; behavioral disturbances, such as avoidance of feared objects; and associated distress or impairment (Beesdo, Knappe, and Pine 2009).
- *ADHD* is a neurodevelopmental disorder characterized by inattention and disorganization, with or without hyperactivity-impulsivity, causing impairment of functioning (APA 2013). ADHD persists into adulthood in approximately 20 percent of individuals (Polanczyk and Rohde 2007).
- *Conduct disorder* diagnosed in children under the age of 18 years is characterized by a pattern of antisocial behaviors that violate the basic rights of others or major age-appropriate societal norms.
- *Autism* is a neurodevelopmental disorder characterized by severe impairment in reciprocal social interactions and communication skills, as well as the presence of restricted and stereotypical behaviors.
- *Intellectual disability* is a generalized disorder that is characterized by significantly impaired cognitive functioning and deficits in two or more adaptive behaviors (APA 2013).

### Scope of the Chapter

This chapter reviews interventions to reduce the prevalence of childhood mental and developmental disorders through the prevention, reduction, or remission of symptoms. The effectiveness of selected interventions is evidence based; these interventions have the potential to be delivered in low- and middle-income countries (LMICs). The chapter does not discuss childhood depression, because of the overlap in interventions with adult depression.

The chapter considers interventions in terms of delivery platforms rather than specific disorders. This choice is because of the very high comorbidity between childhood mental and developmental disorders (Bakare 2012; Rutter 2011). In addition, risk factors for childhood disorders are nonspecific and pluripotent. For example, children who are maltreated are at higher risk of a wide range of mental and developmental disorders (Benjet, Borges, and Medina-Mora 2010).

## Nature of Childhood Mental and Developmental Disorders

Childhood mental and developmental disorders are an emerging challenge to health care systems globally. Two contributing factors are the increases in the proportion of children and adolescents in the populations of LMICs, which is a result of reduced mortality of children under age five years (Murray and others 2012), and the fact that the onset of many adult mental and developmental disorders occurs in childhood and adolescence (Kessler and others 2007).

### Global Epidemiology and the Burden of Childhood Mental and Developmental Disorders

Ascertaining the global epidemiology of mental disorders is a difficult task, given the significant paucity of data for many geographical regions, as well as the cultural variations in presentation and measurement. These issues are exacerbated when investigating mental disorders in children, particularly in LMICs where other health concerns, such as infectious diseases, are priorities. The issue of data paucity was highlighted in the Global Burden of Disease Study 2010 (GBD 2010) (Whiteford and others 2013).

Epidemiologically, childhood mental disorders were relatively consistent across the 21 world regions defined by GBD 2010. However, these prevalence estimates were based on sparse data; some regions, such as Sub-Saharan Africa, have no data whatsoever for some disorders or no data for specific disorders in childhood. Although regional differences may exist, the lack of data makes them difficult to ascertain. The 12-month global prevalence of childhood mental disorders in 2010 is shown in table 8.1. ADHD, conduct disorder, and autism were more prevalent in males; females were more likely to suffer from anxiety disorders. Anxiety disorders and ADHD were more common in adolescents compared with children.

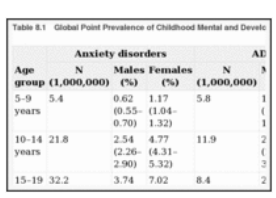


Table 8.1 Global Point Prevalence of Childhood Mental and Develc

| | Anxiety disorders | | | | AE |
|---|---|---|---|---|---|
| Age group | N (1,000,000) | Males (%) | Females (%) | N (1,000,000) | ) |
| 5-9 years | 5.4 | 0.62 (0.55-0.70) | 1.17 (1.04-1.32) | 5.8 | 1 ( 1 |
| 10-14 years | 21.8 | 2.54 (2.26-2.90) | 4.77 (4.31-5.32) | 11.9 | 2 ( 3 |
| 15-19 | 32.2 | 3.74 | 7.02 | 8.4 | 2 |

**Table 8.1**

Global Point Prevalence of Childhood Mental and Developmental Disorders by Gender and Total Number of Cases, 2010.

Most children and adolescents with mental and developmental disorders were in South Asia, reflecting the high population in this region and the reduction in mortality of infants and young children (Murray and others 2012). The populations of LMICs tend to have higher proportions of children and adolescents than those of high-income countries (HICs). For example, 40 percent of the population in the least developed countries is younger than age 15 years, compared with 17 percent in more developed regions (United Nations 2011). Furthermore, population aging is

occurring more slowly in LMICs, with some low-income countries predicted to have the youngest populations by 2050, given their high fertility rates (United Nations 2011). These trends mean that childhood mental and developmental disorders will increase in significance in LMICs. Furthermore, the continuing reductions in infant mortality caused by infectious diseases mean more children will reach adolescence where the prevalence of mental disorders increases and the onset of adult mental disorders occurs. This will challenge already limited mental health services in these countries.

### Risk Factors for Childhood Mental and Developmental Disorders

The risk factors for childhood mental and developmental disorders shown in table 8.2 can be divided into lifelong and age-specific risk factors (Kieling and others 2011). The health of children is highly dependent on the health and well-being of their caregivers; the environments in which the children live (including home and school); and, as they transition into adolescence, the influence of their peers. The relative importance of a particular risk factor should be considered in terms of prevalence, strength of the association with an adverse outcome, and potential to reduce exposure to that risk factor (Scott and others 2014). Using these criteria, efforts to address maternal mental health problems and improve parenting skills have the greatest potential to reduce mental and developmental disorders in children.

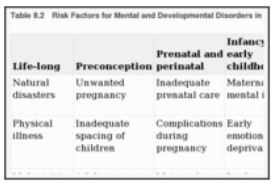


Table 8.2 Risk Factors for Mental and Developmental Disorders in

| Life-long | Preconception | Prenatal and perinatal | Infancy early childh |
|---|---|---|---|
| Natural disasters | Unwanted pregnancy | Inadequate prenatal care | Materna mental i |
| Physical illness | Inadequate spacing of children | Complications during pregnancy | Early emotion depriva |

**Table 8.2**

Risk Factors for Mental and Developmental Disorders in Children and Adolescents.

### Consequences of Childhood Mental and Developmental Disorders

The consequences of these disorders include the impact during childhood and the persistence of mental ill health into adult life. In childhood, the impact is broad, encompassing the individual suffering of children, as well as the negative effects on their families and peers. This impact may include aggression toward other children and distraction of peers from learning. Children with mental and developmental disorders are at higher risk of mental and physical health problems in adulthood, as well as increased likelihood of unemployment, contact with law enforcement agencies, and need for disability support.

### Trends in Childhood Mental and Developmental Disorders

GBD 2010 estimated burden across five time points (1990, 1995, 2000, 2005, and 2010) and found that the prevalence and burden of childhood mental disorders remained consistent between 1990 and 2010 (Erskine and others 2015). Although the rates may not have changed, population growth and aging have impacts on the burden of disease attributable to mental disorders in childhood. As the population of children increases globally, the burden of disease attributable to mental disorders in children will increase.

## Interventions for Childhood Mental and Developmental Disorders

### Population Platform Interventions

#### Child and Adolescent Mental Health Policies and Plans

Few countries have developed national policies and plans to address mental and developmental disorders in children. The World Health Organization (WHO) has published a modular package for governments, policy makers, and service planners, *Child and Adolescent Mental Health Policies and Plans*, to address this need (WHO 2005b). The guidelines recommend attention to a

broad range of areas pertaining to childhood mental and developmental disorders (box 8.1). The provision of health services for children in isolation will not prevent mental and developmental disorders or have significant benefits for children with these disorders. Instead, an ecological approach that addresses problems in the systems around children (parents, family, and school) in combination with targeted interventions for children is necessary to make a meaningful difference (Kieling and others 2011).

**Box 8.1**

Areas for Action for Child and Adolescent Mental Health.
Financing Collaboration across sectors

### Child Protection Legislation

Child maltreatment is a well-established risk factor for mental and developmental disorders in children (Benjet, Borges, and Medina-Mora 2010). Child maltreatment is defined as any form of physical or emotional ill-treatment, sexual abuse, neglect or negligent treatment, or commercial or other exploitation that results in actual or potential harm to a child's health, survival, development, or dignity in the context of a relationship of responsibility, trust, or power (Krug and others 2002). Legislation to address child maltreatment requires the support of well-integrated systems that increase public awareness and enable incident reporting to a constituted authority with investigative and interventional expertise and the ability to prosecute (Svevo-Cianci, Hart, and Rubinson 2010). Limited evidence suggests that legislation to protect children living outside the family home in LMICs has benefits for their health and safety (Fluke and others 2012); however, further research is needed to determine the effectiveness of such legislation for children living with their families of origin.

## Community Platform Interventions

### Early Child Development

Attempts have been made to develop community- and primary care–based services in LMICs. Eickmann and others (2003) delivered a community-based psychosocial stimulation intervention to mothers in a study of 156 infants (age 12 months) in four towns in Brazil. The intervention consisted of 14 contacts (three workshops and 11 home visits) where mothers were taught the importance of play for children's development, how to make toys from disposable household items, and how to play and positively interact with their children. Children of mothers who received the intervention had significantly improved cognitive and motor development; the greatest effects were observed in infants whose development was mildly delayed. The authors proposed the intervention could be delivered through local neighborhood groups run by mothers (Eickmann and others 2003).

Powell and others (2004) demonstrate that a psychosocial stimulation intervention could be delivered to infants in Jamaica by community health aid workers in a cluster randomized control trial of 139 mother-infant dyads where the infants were malnourished. The weekly home visits supporting maternal play with children showed that infants in the intervention group had improved overall development as well as improved hearing, speech, and hand-eye coordination. Health aid workers received two weeks of additional training to deliver the intervention, which was provided as part of an existing home visitation program for malnourished children (Powell and others 2004). A follow-up study 25 years later found that those Jamaican children who received early psychosocial stimulation had, on average, 25 percent increased earnings, suggesting long-term economic benefits to infants receiving this intervention (Gertler and others 2014). These studies show psychosocial stimulation is an effective intervention to support

cognitive, language, and motor development in young children, conferring short- and long-term benefits, although mental health outcomes were not assessed.

The delivery of community-based interventions poses significant challenges, but the feasibility has been demonstrated in LMICs (Bauermeister and others 2006). Brazil, the Arab Republic of Egypt, Israel, and Lebanon implemented and evaluated a comprehensive community-based program with a package of interventions that could be adapted to different countries and localities based on the following:

- Amount of health care and school resources available
- Nature and severity of the types of problems in children
- Preferences and cultural factors that are important within communities.

Manuals were developed that enabled non-mental health professionals in areas with limited resources to deliver the interventions. The manuals consisted of education, parenting skills training, child training, and cognitive and behavioral therapy. These were adapted for local communities with attention to terminology, modifications to reduce stigma, and emphasis on culturally acceptable parenting skills. The feedback received from these sites indicates that the interventions were useful in helping children with internalizing and externalizing problems (Bauermeister and others 2006). Strategies to improve access to community-based interventions require investments in gatekeepers, such as parents, teachers, and general practitioners. Easy-to-read manuals and guides with culturally adapted strategies for the management of childhood mental disorders through nonspecialist primary care can be useful resources for practitioners seeking to develop services in such settings (Eapen, Graham, and Srinath 2012).

Most preventive interventions implemented in early childhood in LMICs target child development generally, rather than child mental health specifically. However, increasing evidence shows that some of these early interventions can benefit the mental health of children, with benefits maintained into adolescence and adulthood. In Jamaica, an early stimulation program for very undernourished children, which involved home visits over two years, reduced anxiety, depression, and attention deficit disorder, and enhanced self-esteem at ages 17–18 years (Walker and others 2010). In Mauritius, two years of high-quality preschool, from age three years, reduced conduct disorder and schizotypal symptoms at age 17 years and criminal offenses at age 23 years (Raine and others 2003). These benefits were greatest for children who were undernourished at age three years. Such interventions can be integrated with community-based maternal child health programs and should be prioritized in LMICs (Kieling and others 2011).

### School-Based Interventions

Schools have a profound influence on children, families, and communities. School-based mental health services also have the potential to bridge the gap between need and utilization by reaching children who would otherwise not have access to these services. These settings could provide an ideal environment in which programs for child mental health can be integrated in a cost-effective, culturally acceptable, and nonstigmatizing manner (Patel, Aronson, and Divan 2013). However, the evidence for school-based interventions for childhood mental and developmental problems in LMICs is limited (Kieling and others 2011; Maulik and Darmstadt 2007).

In Jamaica, Baker-Henningham and others (2012) conducted a cluster randomized control trial of 225 children (ages 3–6 years) with high levels of emotional and behavioral problems, attending 24 community preschool centers. The study examined the effectiveness of teacher training in "The Incredible Years," a children's mental health program. The intervention led to significant reductions in conduct problems (effect size [ES] = 0.42) and increased friendship skills (ES =

0.74). School attendance and parent-reported behavior at home also improved (Baker-Henningham and others 2012). This study demonstrates that school-based interventions in a middle-income country are effective and feasible in reducing behavioral problems in young children.

Bullying or peer victimization is a specific form of aggression defined as "a form of aggression in which one or more children repeatedly and intentionally intimidate, harass, or physically harm a victim" (Vreeman and Carroll 2007). The long-term impacts of bullying behavior are serious; children who are victims, bullies, or both have elevated rates of psychiatric disorders in childhood and early adulthood (Copeland and others 2013). Accordingly, the prevention of peer victimization in schools is an important strategy to reduce the occurrence of mental disorders and other adverse consequences in children and adults.

Different approaches to reducing bullying behavior have been assessed in the literature. In one systematic review, Vreeman and Carroll (2007) grouped the interventions into three main types: curriculum interventions, whole-of-school approaches, and social and behavioral skills training. Whole-of-school approaches have been found to be effective; these approaches use a multidisciplinary approach that includes combinations of school rules and sanctions, classroom curriculum, teacher training, individual counseling, and conflict resolution training. In a meta-analysis, Ttofi and Farrington (2011) found that school-based anti-bullying programs can reduce bullying by about 20 percent, with greater effects observed in interventions that adopt more of a whole-of-school approach. However, very few, if any, evaluations of interventions to prevent bullying have been conducted in LMICs.

Further research is required to demonstrate the effectiveness of school-based interventions supporting children with autism and intellectual disability.

#### Voluntary Sector Programs

Agencies in the voluntary sector (those that are nongovernment and not for-profit) have traditionally played an important role in raising awareness of the issues faced by children with mental health difficulties and their families, as well as in reducing the associated stigma. In some countries, the voluntary sector provides the bulk of child mental health services. However, the evidence base for such interventions is poor, largely because of the absence of research support for program evaluation. The magnitude of mental health problems affecting children and the absence of policies to guide service development are significant barriers to coordinated service provision and evaluation of voluntary sector programs for children in LMICs (Omigbodun 2008; Patel and Thara 2003).

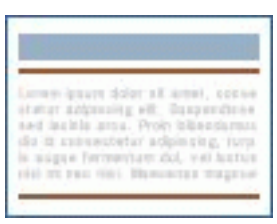
### Health Care Platform Interventions

#### Screening and Community Rehabilitation for Developmental Disorders

Providing early interventions to children with developmental disorders may optimize their developmental outcomes (Sonnander 2000). Screening is necessary to identify children in need of these resource-intensive interventions. Screening instruments for LMICs need to be culturally acceptable and have sound psychometric properties that have been validated in the local context (Robertson and others 2012). Instruments developed for screening children for developmental disorders in HICs (such as Denver II) may not be appropriate (Gladstone and others 2008). For example, items assessing whether a child can cut using scissors or catch a bouncing ball may be inappropriate if these resources are unavailable in the community or if parents do not model or encourage these activities. A systematic review identified instruments that have been used for the developmental screening of young children in LMICs (Robertson and others 2012). Two of the screening tools identified as useful were the Ten Questions (TQ) screen (Belmont 1986; Zaman

and others 1990) and the ACCESS portfolio (Wirz and others 2005).

The TQ screen (box 8.2) is a brief questionnaire administered to parents of children ages two to nine years. Five questions assess cognitive ability; two questions assess movement ability; one question addresses any history of seizures; one assesses vision; and one assesses hearing. The items require a dichotomous response of yes-no and ask about the skills that children will acquire in any culture. They ask parents to compare their children to other children in their community (Belmont 1986; Zaman and others 1990). The TQ was included as a disability module in the third round of the United Nations Children's Fund Multiple Indicator Cluster Survey, and administered to almost 200,000 children across 18 countries (Gottlieb and others 2009). The TQ is a sensitive tool that identifies 80–100 percent of children with developmental disorders; however, it has a low specificity, necessitating a second stage to examine those children who screen positive (Durkin and others 1994).



**Box 8.2**

Ten Questions Screen. Compared with other children, did the child have any serious delay in sitting, standing, or walking? Compared with other children, does the child have difficulty seeing, either in the daytime or night?

Administration of the ACCESS portfolio provides screening of children with developmental disorders, as well as simple advice to parents. Community health workers (CHWs) in Sri Lanka and Uganda used the ACCESS portfolio to assess children younger than age three years whose mothers had expressed concerns. The CHWs' assessments of delay had an 82 percent accuracy in children older than age two years, compared with those identified by medical or allied health staff, although the sensitivity and specificity of the instrument were not measured. The ACCESS portfolio raised awareness of developmental disorders in communities, and CHWs and parents reported it to be helpful (Wirz and others 2005).

Two significant issues arise following the identification of children with developmental disorders. The first involves the stigma associated with these diagnoses in some countries and cultures. The second is the limited evidence for the effectiveness of community-based rehabilitation for children with intellectual disabilities and autism in LMICs. These issues do not necessarily indicate that interventions are ineffective, but rather that further evaluation is required (Hastings, Robertson, and Yasamy 2012; Robertson and others 2012).

### Parenting Skills Training

Parenting skills training aims to enhance or support the parental role through education and training, thereby improving emotional and behavioral outcomes for children. A meta-analysis identified four components of parenting skills training that were particularly effective. Increasing positive parent-child interactions, teaching parents how to communicate emotionally with their children, teaching parents the use of time out as a means of discipline, and supporting parents to consistently respond to their children's behaviors had the largest effects on reducing externalizing behaviors in children (Kaminski and others 2008).

Several systematic reviews have demonstrated the effectiveness of parenting skills training in reducing internalizing and externalizing problems in children (Furlong and others 2013; Kaminski and others 2008), as well as in reducing the risk of unintentional childhood injuries (Kendrick and others 2007) and improving the mental health of parents (Barlow and others 2014). Childhood disruptive and externalizing behaviors may persist into adolescence, affecting peers, schools, and communities (Fergusson, Horwood, and Lynskey 1994). Furthermore,

although many externalizing behaviors diminish as individuals mature through adolescence, life course persistence of antisocial behaviors is more likely in those with childhood-onset conduct problems (Moffitt and others 2002). A meta-analysis of group-based parenting skills training for parents of children with conduct problems showed moderate effect sizes with a standardized mean difference in conduct problems of –0.53 (95 percent confidence interval [CI]: –0.72 to –0.34) as assessed by parents (Furlong and others 2013). Therefore, parenting skills interventions can reduce or prevent the onset of childhood mental disorders and subsequent adverse health and social outcomes.

The evidence for the effectiveness of parenting skills training comes from studies conducted in HICs (Furlong and others 2013). A systematic review of parenting interventions in LMICs reported that most studies examined educational or physical outcomes (Mejia, Calam, and Sanders 2012). However, eight studies examined interventions to prevent or reduce emotional and behavioral problems in children. The following outcomes were assessed:

- Infant attachment (Cooper and others 2009)
- Maternal understanding and attitude about child development (Jin and others 2007; Klein and Rye 2004; Rahman and others 2009)
- Mother-child interaction (Klein and Rye 2004; Wendland-Carro, Piccinini, and Millar 1999)
- Child abuse (Aracena and others 2009; Oveisi and others 2010)
- Reductions in child behavioral problems (Fayyad and others 2010).

The mean effect size of the parenting skills training across the eight studies was large (Cohen's d = 0.81) (Mejia, Calam, and Sanders 2012); benefits persisted in the follow-up studies, which were as long as 18 months in a study in South Africa (Cooper and others 2009) and six years in a study in Ethiopia (Klein and Rye 2004). Thus, emerging evidence from available research suggests parenting skills training is a feasible and effective intervention in LMICs. The extensive research base available from HICs requires integration with knowledge acquired from studies conducted in LMICs for the development of culturally appropriate parenting skills training.

### Maternal Mental Health Interventions

Poor maternal mental health is a risk factor for children's physical, cognitive, and socioemotional development (Deave and others 2008; Feldman and others 2009; Glasheen, Richardson, and Fabio 2010; Grace, Evindar, and Stewart 2003; Grigoriadis and others 2013; Grote and others 2010; Hamadani and others 2012; Wachs, Black, and Engle 2009; Wan and others 2007); the impact continues into adolescence and adulthood (Murray and others 2011; Pearson and others 2013). Interventions that target maternal mental health problems, especially in the perinatal period and early infancy, are important for child mental health and need to be incorporated into primary care.

Perinatal mental disorders can be divided into *common mental disorders* (including depression and anxiety disorders) and *severe mental disorders* (schizophrenia and bipolar disorder). Two meta-analyses have reported that the prevalence of common mental disorders in women in LMICs is between 15.6 percent during pregnancy and 19.8 percent postpartum (Fisher and others 2012; Parsons and others 2012). Maternal depression is the most prevalent condition—and has the largest public health impact (Rahman, Surkan, and others 2013). A recent systematic review identified 16 longitudinal studies of adolescent mental and developmental health outcomes of children of mothers who had postnatal depression. Increased risk of cognitive delays in the children was the most consistent finding, with some studies also reporting that children of

mothers with postnatal depression had increased risk of internalizing and externalizing symptoms and increased general psychopathology (Sanger and others 2015). Accordingly, treatment of maternal mental health problems can reduce suffering in the mother while potentially preventing mental and developmental disorders in the children.

Postnatal depression is the condition for which interventions are most amenable to integration into primary care and maternal and child health platforms (Rahman, Surkan, and others 2013). Such integration requires task-shifting strategies, supported by the development of training curricula and treatment packages that bundle skills that are logically grouped together for content, training, and operational use (Patel and others 2013).

These interventions also require a change in the approach of mental health specialists, as well as health policy and planning specialists—a shift of focus from a model that is specialist and center based to a model that is primary care and community based. Integrated treatment programs, in which health and social care providers are supported to manage common mental health problems, offer a chance to treat the whole person. This approach is more patient centered and is often more effective than one in which mental, physical, and reproductive health problems are addressed separately without effective communication among providers (Patel and others 2013).

Maternal and child health workers are well-positioned to adopt comprehensive approaches to care, which is particularly important for children because their psychosocial well-being is closely linked to the mental health of their parents and the quality of their family and school environments. Maternal and child health workers have knowledge of community resources and health, social, and education services, and they can better respond to the specific needs of local communities. In Pakistan, the Canadian “Learning through Play” program was adapted and taught through one-day workshops to women in the Lady Health Workers program, members of the local community who deliver preventive maternal and child health care. A cluster randomized trial demonstrated that an evidence-based program for maternal mental health and child development can be delivered through existing local health workers in an LMIC (Rahman, Surkan, and others 2013).

In Chile, a multicomponent intervention for postnatal depression was evaluated in a randomized control trial of 230 women. The intervention consisted of group education about illness and symptoms, problem-solving strategies for mothers, and structured pharmacotherapy when required, delivered through existing local primary care clinics. Compared with those who received treatment as usual, mothers with depression had significant improvements. This study demonstrates the efficacy and feasibility of delivering care to mothers with postnatal depression in an LMIC (Rojas and others 2007).

Participatory women’s groups are also a viable model of intervention for postnatal depression. Improvements in maternal and infant health were achieved in a study of 19,030 births in rural India through monthly participatory groups facilitated by peers. The study involved the identification of maternal and neonatal health problems, identification of solutions, and implementation and evaluation of strategies in partnership with local health services (Tripathy and others 2010). This study demonstrates the feasibility and effectiveness of participatory women’s groups in reducing postnatal depression in a very poorly resourced region of India.

Much of the research on psychological and psychosocial interventions for maternal depression has been conducted in HICs (Sockol, Epperson, and Barber 2011). Substantial evidence indicates that such interventions are effective in reducing depressive symptoms within the first year postpartum (relative risk = 0.70, 95 percent CI: 0.60 to 0.81) (Dennis and Hodnett 2007). Over the past decade, evidence of the effectiveness of interventions led by non-mental health specialists (for example, by nurses, health visitors, or midwives) has increased (Crockett and

others 2008; Lumley and others 2006; MacArthur and others 2003; Morrell and others 2009; Roman and others 2009).

In LMICs, the public health importance of maternal mental health has led to increased research on interventions. A review and meta-analysis identified 13 trials that included 20,092 participants (Rahman, Fisher, and others 2013). In all these studies, the intervention was delivered by supervised, nonspecialist health and community workers; in many of the studies, the intervention was integrated into a primary care platform. Compared with routine care, the evidence suggests significant benefits for mothers and children from the interventions tested. The pooled effect size for maternal depression was 0.38 (95 percent CI: –0.56 to –0.21). Where assessed, the benefits to children included improved mother-infant interaction, better cognitive development, reduced diarrheal episodes, and increased rates of immunization.

### Cognitive Behavioral Therapy

Cognitive behavioral therapy (CBT) is a psychological intervention used for the management of anxiety disorders in children. The components of CBT for children consist of cognitive interventions and behavioral strategies. The cognitive interventions teach children to recognize their anxious feelings and the somatic experiences that accompany anxiety (for example, breathlessness and palpitations), identify the anxious thoughts that are associated with the anxious feelings, develop alternative thoughts (for example, positive self-talk) and other coping strategies, and evaluate the differences in their emotions after using the coping strategies. The behavioral interventions include relaxation training, modeling behaviors, and graded exposure to anxiety-provoking stimuli.

A meta-analysis of 41 studies examined the effectiveness of CBT compared with waitlist control, treatment as usual, and other interventions (James and others 2013). Compared with waitlist controls, CBT had a large effect on reducing anxiety diagnoses and symptoms, with a standarized mean difference of –0.98 (95 percent CI: –1.21 to –0.74). However, these studies were conducted in outpatient clinics in HICs; none of the included studies were from LMICs.

The evidence for the effectiveness of CBT in LMICs is very limited; two studies evaluate the effectiveness of this intervention. In Zambia, local lay counselors delivered trauma-focused CBT to the families of 58 children and adolescents between the ages of 5 and 18 years who had moderate to severe trauma symptoms. The intervention was provided to the families of the children and achieved significant reductions in the severity of trauma symptoms, as well as the feelings of shame. Although there was no control group, this study demonstrates the potential feasibility of delivering trauma-focused CBT in LMICs (Murray, Dorsey, and others 2013; Murray, Familiar, and others 2013).

In a study in Brazil, clinical psychologists delivered 14 sessions of group-based CBT, with two concurrent parental sessions, to 28 children ages 10–13 years who were suffering from anxiety disorders. Twenty children (71 percent) completed the treatment; there was a reduction in symptoms, with a moderate to large effect size (Cohen’s d between 0.59 and 2.06), depending on the outcome measure used (De Souza and others 2013). These studies provide preliminary evidence of the feasibility of CBT-based interventions for anxiety disorders in LMICs; however, further research is needed.

### Medications for ADHD

Pharmacotherapy has the strongest evidence for reducing behavioral problems and improving the attention and educational performance of children with ADHD (Benner-Davis and Heaton 2007; Greenhill and others 2002; Prasad and others 2013). The dispensing of stimulant medications is increasing in HICs (Hollingworth and others 2011; McCarthy and others 2012), but no studies

have examined whether these trends exist in LMICs. The wide recognition in HICs of the problems of stimulant medication diversion and misuse has resulted in recommendations for increased monitoring and regulations (Kaye and Darke 2012). Therefore, although stimulant medications are very effective treatments for ADHD, the potential difficulties with obtaining comprehensive assessments of the children to ensure accurate diagnosis and the high likelihood of diversion and misuse in the absence of regulatory systems limit the feasibility of the widespread use of stimulant medications in LMICs.

## Specialist Health Care

### *Medications for Conduct Disorder*

Parenting interventions are the best treatments for younger children with disruptive behavioral disorders, such as oppositional defiant disorder and conduct disorder. However, the use of pharmacotherapy can assist in the treatment of adolescents with conduct disorder. Recent evidence has suggested that the use of pharmacologic agents—in particular, second-generation antipsychotics—is increasing (Pringsheim and Gorman 2012) in children and adolescents with conduct disorder.

Although the use of such agents is increasing, the evidence base is not necessarily strong. Reasonably strong evidence supports the use, particularly in the short term, of second-generation antipsychotics, especially risperidone, in young people with borderline intelligence quotients (IQs) (Duhig, Saha, and Scott 2013). However, the evidence in young people with a normal IQ is not strong. Other agents have also been evaluated in such children, including stimulants and lithium (Ipser and Stein 2007). Psychopharmacological therapy in young people with conduct disorder needs to be carefully monitored and only introduced within the setting of specialist care (Ipser and Stein 2007). Its routine use, particularly in LMICs, is not recommended.

### *Psychosocial Treatments for Conduct Disorder*

Psychosocial treatments have been evaluated for children and adolescents with conduct disorder and other disruptive behaviors, including cognitive behavioral intervention (CBI), problem-solving skills therapy (PSST), and multisystem therapy.

- *Cognitive behavioral intervention*. The goal of CBI is to train children in altering their dysfunctional (aggressive) cognitive processes. Generally, such interventions have been found to be effective in children with disruptive behaviors, with effect sizes observed of approximately 0.67 (Sukhodolsky, Kassinove, and Gorman 2004). A meta-analysis of CBI and parenting interventions and CBI for the treatment of youth with antisocial behavior problems (a common sequalae of conduct disorder) found that the effect size was 0.47 for parenting interventions and 0.35 for CBI (McCart and others 2006). This review concluded that parent training appeared to have greater impacts on younger children and CBI was more effective for adolescents.
- *Problem-solving skills therapy*. PSST is an individual-based intervention for children and adolescents that focuses on changing the way children interact with the significant others in their lives. The existing evaluations of this type of therapy were conducted in the 1990s (Kazdin, Siegel, and Bass 1992). These studies have shown the therapy to be largely efficacious and incrementally supportive of the therapeutic effects of parent training (Handwerk and others 2012). PSST has also been found to be effective as an adjunctive treatment for conduct disorder. The evidence suggests that PSST can complement parenting interventions and increase the effectiveness of parenting interventions incrementally (Handwerk and others 2012). The evidence for adapting PSST to various

cultures is limited, and further research is required before this intervention can be recommended in LMICs.

- *Multisystem therapy*. Multisystem therapy is a comprehensive intervention targeting adolescents with disruptive behaviors. It is a highly intensive therapy based on the use of different types of therapies deemed appropriate by individual therapists. The existing evaluations of this therapy, including meta-analyses, have demonstrated its efficacy, particularly in adolescents with more serious delinquency tendencies (Curtis, Ronan, and Borduin 2004). However, the therapy's highly intensive nature may render it unsuitable as an intervention in LMICs.

Handwerk and others (2012) provide an excellent summary of the literature on interventions targeting conduct disorders. The overall recommendations include parent training, particularly for parents of younger children, with the choice of intervention format largely a matter of personal and health system preference. The evidence base for CBI is not as extensive as that for parenting interventions; the effect sizes appear to be small to modest. Notably, the augmentation of parenting interventions with CBI appears to be particularly promising. Furthermore, CBI interventions seem to have more efficacy in adolescents.

## Cost-Effectiveness Analyses

The evidence base for the cost-effectiveness of interventions targeting children and adolescents is considerably more modest than that for adults. In a systematic review of the literature that included studies published up to 2009, Kilian and others (2010) found 19 studies of the cost-effectiveness of psychiatric interventions targeting children and adolescents. Few studies use a cost-utility analysis framework, whereby outcomes are expressed as generic indices combining mortality and morbidity; a common example of such an outcome is quality-adjusted life years (QALYs). The advantage of cost-utility analysis is that value-for-money judgments can be made, since thresholds of good value can be specified for QALYs in different health care settings (Drummond and others 2005). Moreover, interventions can be compared within and across different disorder categories.

Studies of pharmacological interventions for ADHD have largely found such interventions to be cost-effective (King and others 2006), with existing studies finding that such interventions fall below commonly accepted thresholds of value for money in HICs (such as £30,000/QALY[1]). Studies that have evaluated uncertainty around the point estimates have found such conclusions to be robust (Donnelly and others 2004). Evaluations of behavioral interventions find such interventions to be cost-effective; for example, Dretzke and others (2005) find that parenting interventions for conduct disorder are cost-effective. However, sensitivity testing around this estimate shows that the results could change dramatically depending on model assumptions. Mihalopoulos and others (2007) find that modest improvements in the symptoms of conduct disorder can be associated with considerable cost-savings that outweigh the cost of implementing the parenting intervention in an Australian setting. No identified studies have evaluated the cost-effectiveness of interventions in LMICs.

In conclusion, the evidence base of the cost-effectiveness of interventions targeting children and adolescents with mental disorders is still in its infancy. The reasons for this include the limitations of the use of generic outcome indexes, such as QALYs, in children with mental disorders, as well as the difficulties in assessing costs. Future research to fill this evidence gap is urgently needed.

## Conclusions

Childhood mental and developmental disorders globally account for a significant health and societal burden. The evidence base for interventions to prevent and treat mental and developmental disorders in LMICs is limited. Future implementation of programs to address childhood mental and developmental disorders in LMICs should be evaluated. Other evidence-based key recommendations for interventions are summarized in table 8.3.

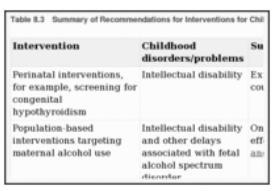


Table 8.3 Summary of Recommendations for Interventions for Chil

| Intervention | Childhood disorders/problems | Su |
|---|---|---|
| Perinatal interventions, for example, screening for congenital hypothyroidism | Intellectual disability | Ex co |
| Population-based interventions targeting maternal alcohol use | Intellectual disability and other delays associated with fetal alcohol spectrum disorder | On eff an |

**Table 8.3**

Summary of Recommendations for Interventions for Childhood Mental and Developmental Disorders.

As the evidence presented in this chapter indicates, key interventions that have the potential to reduce mental and developmental disorders in childhood are parenting skills training that includes psychosocial stimulation, teacher training with “The Incredible Years” program, and maternal mental health interventions. The evidence suggests that these can be feasibly delivered in LMICs, and that they have a strong efficacy in HICs. CBT for anxiety disorders has a strong evidence base in HICs, but much more work is needed to demonstrate the feasible delivery of this intervention in LMICs. Pharmacotherapy requires specialist care and assessment that limits use in LMICs.

The screening of children for developmental disorders is possible in LMICs; however, the evidence for intervening once autism or intellectual disability has been identified is limited. Similarly, child protection and reduction of bullying in schools are important preventive strategies for childhood mental disorders. The systems required for child protection are complex and require collaboration across sectors and significant government investment. Further research on interventions to protect children is urgently required in LMICs. Reducing bullying in schools may prevent mental disorders in childhood and later in life; however, there are no data to show effective programs in LMICs.

The widespread implementation and evaluation of parenting skills training, including psychosocial stimulation and maternal mental health interventions, is recommended in all countries to achieve a meaningful reduction in the global prevalence and burden of childhood mental and developmental disorders.

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## Footnotes

1 This is a standard cutoff for cost-effectiveness used in the United Kingdom, comparable to the US$50,000 threshold commonly used.

World Bank Income Classifications as of July 2014 are as follows, based on estimates of gross national income (GNI) per capita for 2014:

- Low-income countries (LICs) = US$1,045 or less
- Middle-income countries (MICs) are subdivided:
  a) lower-middle-income = US$1,046 to US$4,125
  b) upper-middle-income = US$4,126 to US$12,745
- High-income countries (HICs) = US$12,746 or more.

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