Chapter 8. Childhood Mental and Developmental Disorders

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Abstract:

Childhood mental and developmental disorders have serious adverse impacts on the psychological and social well-being of children and their families. The mental health of children is highly dependent on the health and well-being of their caregivers. Despite the burden that mental health problems impose on children and adolescents, most countries do not provide satisfactory care to those in need. The widespread implementation and evaluation of parenting skills training and maternal mental health interventions in all countries is recommended to achieve a meaningful reduction in the global prevalence and burden of childhood and developmental disorders.

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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 and others, 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 (American Psychiatric Association, 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 and others, 2009).
- **ADHD** is a neurodevelopmental disorder characterized by inattention and disorganization, with or without hyperactivity-impulsivity, causing impairment of

functioning (American Psychiatric Association, 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 (American Psychiatric Association, 2013).

Scope of Chapter

This chapter reviews interventions to meaningfully 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.

This chapter considers interventions in terms of delivery platforms rather than specific disorders. This choice is due to the very high comorbidity between the childhood mental and developmental disorders (Bakare, 2012, Rutter, 2011). Additionally, risk factors for childhood disorders are non-specific and pluripotent. For example, children who are maltreated are at higher risk of a wide range of mental and developmental disorders (Benjet and others, 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 that is due to the 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 terms of 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), which quantified the burden in terms of years lived with disability (YLDs), years of life lost due to premature mortality (YLLs), and disability-adjusted life years (DALYs = YLDs + YLLs) (Murray and others, 2012).

Burden calculation first required systematically reviewing and modeling the available epidemiological data for mental disorders to provide the necessary prevalence outputs (Baxter and others, 2014, Erskine and others, 2013, Whiteford and others, 2013). The 2010 global and regional prevalence of anxiety disorders, ADHD, conduct disorder, and autism in males and females ages 5-9, 10-14, and 15-19 years are shown in tables 8.1, 8.2, and 8.3 (Baxter and others, 2014, Erskine and others, 2013). Prevalence was not calculated for idiopathic

intellectual (Whiteford and others, 2013) l disability, because the burden for this disorder was treated as a residual category once all other intellectual disability had been reattributed to specific causes, for example, neonatal encephalopathy (Vos and others, 2012).

<<<Insert tables 8.1, 8.2 and 8.3 about here>>>

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 and subsequently wide uncertainty intervals makes them difficult to ascertain.

The global burden of childhood mental disorders in 2010 is shown in table 8.4 (Institute of Health Metrics and Evaluation, 2013). The comparatively low burden attributable to ADHD and idiopathic intellectual disability was largely due to the low disability weights given to these conditions (Erskine and others, 2014). The burden estimated by GBD 2010 pertains to individual health loss only. It does not take into account the non-health burden, such as the impact on academic functioning; future burden of any kind, such as adverse social or health outcomes; or burden on anyone other than the individual children, such as parents and caregivers. For these reasons, this measurement of individual burden underestimates the full burden of childhood mental disorders.

<<<Insert table 8.4 about here>>>

Gender, age, time, and regional patterns of burden followed that of prevalence. 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 high-income countries (HICs). For example, 40 percent of the population in "least developed countries" is younger than age 15 years, compared to 17 percent in "more developed regions" (United Nations, 2011). Furthermore, population aging is occurring more slowly in low and middles income countries (LMICs), with some low income countries (LICs) predicted to have the youngest populations by 2050, given their high fertility rates (UN 2011). These trends mean that mental disorders occurring in childhood will increase in significance in LMICs. Furthermore, the continuing reductions in infant mortality due to infectious diseases mean more children will reach the ages where mental disorders develop, thereby placing greater strains on 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 8.5 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, both 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 the prevalence, the strength of the association with an adverse outcome, and the potential to reduce exposure to that risk factor (Scott and others, 2014). Using these criteria, efforts to address maternal mental health problems or improve parenting skills may improve the mental health and development of many children.

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Consequences of Childhood Mental and Developmental Disorders

The consequences of these disorders include both 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 upon 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

The prevalence and burden of childhood mental disorders remained consistent between 1990 and 2010 (GBD 2010). Although the rates themselves may not have changed, population and aging do have impacts on the number of YLDs and DALYs attributable to mental disorders in childhood. As the population of children increases globally, the number of DALYs attributable to mental disorders in children will increase.

Interventions for Childhood Mental and Developmental Disorders

Delivery of Interventions in Low-and-Middle-Income Countries

Despite the burden that mental health problems impose on children and adolescents, most countries do not provide satisfactory care to those in need (Belfer and Saxena, 2006a, Lancet Global Mental Health Group and others, 2007). The World Health Organization's (WHO) *Atlas of Child and Adolescent Mental Health Resources* indicated that less than 33% of the countries for which data were provided had a specific entity responsible for child mental health (World Health Organization, 2005). Also, very few countries reported having adequate and permanent budgets for such programs (Belfer and Saxena, 2006b). Independent studies have highlighted the inadequacy of services to address mental health problems in children and adolescents, as well as the lack of training for mental health professionals (Morris and others, 2011).

Guideline Development

To reduce this gap in services, the WHO launched the Mental Health Gap Action Programme (mhGAP) to scale up services for people with mental disorders, including children, especially in LMICS (World Health Organization, 2008). One essential component of mhGAP is to develop management guidelines for the mental disorders identified as conditions of high priority (Dua and others, 2011). The guidelines recognize that in most LMICs, non-specialist primary care personnel deliver the interventions, and the feasibility of delivery was a key consideration. Implementation of these guidelines poses a set of challenges, such as cultural adaptation of strategies from one context to another; stakeholder engagement and collaboration; identification and inclusion of high-risk groups; and cost-effectiveness

determination (Jordans and others, 2010).

Community- and Primary-Care-Based Interventions

Attempts have been made to develop community- and primary care-based services in LMICs. 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 children have
- Preferences and cultural factors that are important within communities.

The feedback received from these sites indicated that the interventions were useful in helping children with internalizing and externalizing problems (Bauermeister and others, 2006). Strategies to improve access to care include 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 non-specialist primary care can be useful resources for practitioners seeking to develop services in such settings (Eapen and others, 2012).

School-Based Services

Schools can 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 non-stigmatizing manner (Patel and others, 2013a).

Voluntary Sector Programs

Agencies in the voluntary sector (those that are not for profit and non-government) have traditionally played a significant 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 of such interventions is sometimes poor largely due to the absence of research support for program evaluation. In India, for example, numerous voluntary sector organizations run mental health programs for children and adolescents (Patel and Thara, 2003). In Nigeria, child mental health professionals partnered with a faith-based organization to provide a combination of spiritual and mental health care for children in an institution for young offenders and abandoned children in southwest Nigeria (Omigbodun, 2008). Both Patel and Thara (2013) and Omigbodun (2008) highlight the opportunities and potential conflicts that such partnerships can bring. However, the magnitude of mental health problems affecting children and the absence of policies to guide service development are significant barriers to coordinated service provision for children in LMICs.

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, both concurrently and into adolescence and adulthood. In Jamaica, an early stimulation program for very undernourished children in Jamaica, which involved home visits over age two years, reduced anxiety, depression, and attention deficit disorder, and it 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 lead to integration with community-based maternal child health programs and ought to be prioritized in LMICs (Kieling and others, 2011).

Population-Wide Platforms

Child Protection Legislation

Child maltreatment, a well-established risk factor for mental and developmental disorders in children (Benjet and others, 2010), 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 and others, 2010). Limited evidence suggests that legislation to protect children living out of 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 on children living with their families of origin.

Community Platforms

Schools and Bullying Prevention

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). Children and adolescents who are bullied are also more likely to be absent from school and have lower levels of self-esteem and self-image (Delfabbro and others, 2006). In contrast, children who are bullies are more likely to engage in criminal behavior into adulthood, even after controlling for other childhood risk factors (Ttofi and others, 2011).

Accordingly, the prevention of peer victimization in schools is a vitally important strategy to reduce the occurrence of mental disorders and other adverse consequences in both children and adults. Schools are a natural setting for such strategies, since they are where most peer-victimization occurs in children. 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. Curriculum interventions include videotapes or written curriculum material that tends to be followed by class discussion. Overall, such interventions have not been found to significantly reduce bullying; in some cases, they may even increase it. In contrast, 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.

However, barriers to the full implementation of such approaches exist. For example, implementation of approaches that have worked very well in one school setting have been shown to have reduced impacts in another setting. Social and behavioral skills training approaches involve targeted training approaches for children involved in bullying. On the whole, these types of approaches appear to work in younger children, with no effects observed when used in older children and adolescents. 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.

Health and Social Care

Primary Health Care

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 the 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 Question (TQ) screen (Belmont, 1986, Zaman and others, 1990) and the ACCESS portfolio (Wirz and others, 2005).

The TQ screen (box 8.1) is a brief questionnaire administered to parents of children ages two years 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 communities (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 (UNICEF) 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 percent to 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 8.1 Ten Questions Screen

1. Compared with other children, did the child have any serious delay in sitting, standing or walking?
2. Compared with other children, does the child have difficulty seeing, either in the daytime or night?
3. Does the child appear to have difficulty hearing?
4. When you tell the child to do something, does he/she seem to understand what you are saying?
5. Does the child have difficulty in walking or moving his/her arms, or does he/she have weakness and/or stiffness in the arms or legs?
6. Does the child sometimes have fits, become rigid, or lose consciousness?
7. Does the child learn to do things like other children his/her age?
8. Does the child speak at all (can he/she make himself/herself understood in words, can he/she say any recognizable words?
9. *For children ages three to nine years, ask:* Is the child's speech in any way different from normal (not clear enough to be understood by people other than his/her immediate family)?
   For children age two years, ask: Can he/she name at least one object (for example, an animal, a toy, a cup, a spoon)?
10. Compared with other children of his/her age, does the child appear in any way mentally backward, dull, or slow?

Source: Zaman and others 1990.

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 to 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 both 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 and others, 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 the 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 both 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 and others, 1994). Furthermore, although many externalizing behaviors diminish as individuals mature through adolescence, life course persistence of anti-social behaviors is more likely in those with childhood-onset conduct problems (Moffitt and others, 2002). A meta-analysis of group-based parental skills training for parents of children with conduct problems showed moderate effect sizes with a standardized mean difference (SMD) in conduct problems of -0.53 (95% confidence interval (CI) -0.72 to -0.34) as assessed by parents (Furlong and others, 2013). Therefore, parenting skills interventions can reduce or prevent both the onset of childhood mental disorders and subsequent adverse health and social outcomes.

The evidence for the effectiveness of parent 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 and others, 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 and others, 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 parent skills training across the eight studies was large (d = 0.81) (Mejia and others, 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 suggests parent 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 to further develop culturally appropriate parenting skills training for these countries.

Maternal Mental Health Interventions. Poor maternal mental health is a risk factor for children's physical, cognitive, and socio-emotional development (Deave and others, 2008, Feldman and others, 2009, Glasheen and others, 2010, Grace and others, 2003, Grigoriadis and others, 2013, Grote and others, 2010, Hamadani and others, 2012, Wachs and others, 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). In HICs, the prevalence of common mental disorders is estimated at up to 11 percent during

pregnancy and 13 percent in the first three months postpartum (period prevalence rates of 18.4 percent and 19.2 percent, respectively) (Gavin and others, 2005). Higher prevalence is generally reported in women in LMICs; two meta-analyses indicate rates between 15.6 percent during pregnancy and 19·8 percent postpartum (Fisher and others, 2012, Parsons and others, 2012).

The prevalence of severe mental disorders in the perinatal period in HICs is approximately 3 percent (Vesga-Lopez and others, 2008); there are no studies in LMICs. Maternal depression is the most prevalent condition—and one that has the largest public health impact (Rahman and others, 2013b). It is also the condition for which interventions are most amenable to integration into primary care and maternal and child health platforms (Rahman and others, 2013b). Such integration requires task-shifting strategies, supported by the development of training curricula and treatment packages that bundle skills that logically group together in terms of content, training, and operational use (Patel and others, 2013b).

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, a more patient-centered approach that is often more effective than one in which mental health, physical health, and reproductive health problems are addressed separately without effective communication among providers (Patel and others, 2013b). Maternal and child health workers are well-positioned to adopt comprehensive approaches to care, particularly important for children whose psychosocial

well-being is closely linked to the mental health of parents and the quality of family and school environments. These workers have a knowledge of community resources, and health, social, and education services, and they can better respond to the specific needs of local communities (Rahman and others, 2013b).

Much of the research on psychological and psychosocial interventions for maternal depression has been conducted in HICs (Sockol and others, 2011); substantial evidence indicates that such interventions are effective in reducing depressive symptoms within the first year postpartum (RR= 0.70, 95% CI 0.60 to 0.81) (Dennis and Hodnett, 2007). Over the past decade, the evidence of the effectiveness of non-mental health specialist-led interventions (for example, by nurses, health visitors, and midwives) has increased in (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 also led to increased research in interventions. A review and meta-analysis identified 13 trials that included 20,092 participants (Rahman and others, 2013a). In all of these studies, the intervention was delivered by supervised, non-specialist health and community workers; in many of the studies, the intervention was integrated into a primary care platform. When compared with routine care, the evidence suggested significant benefit for mothers and children from the interventions tested. The pooled effect size for maternal depression was 0.38 (95% CI: -0.56 to -0.21; I^2=79.9%). 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 to waitlist control, treatment as usual, and other interventions (James and others, 2013). Compared to waitlist controls, CBT had a large effect on reducing anxiety diagnoses and symptoms, with a SMD -0.98 (95% 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 five years 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 demonstrated the potential feasibility of delivering trauma-focused CBT in LMICs (Murray and others, 2013a, Murray and others, 2013b).

In a study in Brazil, clinical psychologists delivered 14 sessions of group-based CBT, with two concurrent parental sessions, to 28 children ages 10 years to 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 .59 to 2.06), depending on the outcome measure used. This study further demonstrates the feasibility of CBT-based interventions for anxiety disorders in LMICS (de Souza and others, 2013).

Specialist Health Care

Maternal Mental Health Interventions. Due to maternal treatment preferences and potential concerns about fetal and infant health outcomes, nonpharmacological treatment options are preferred in the perinatal period. However, the treatment of severe depression and other mental disorders may need to be stepped up if patients are not improving as expected through non-specialist management, or if they experience an acute crisis. In such settings, antidepressant or antipsychotic medication may be prescribed. Antidepressants are effective for depression and anxiety, particularly for severe cases; meta-analyses have demonstrated that the efficacy over placebo increases with the severity of the depression. Very few studies have been conducted on perinatal women due to potential risks, but one recent study indicates that antidepressants are effective (Yonkers and others, 2008). As a general principle, medication use during pregnancy should be minimized; most women with common mental disorders can be effectively treated with non-pharmacological interventions.

Medications for ADHD.

Although behavioral interventions and educational support have demonstrated a moderate effect in reducing the symptoms of children and adolescents with ADHD (Lee and others, 2012), pharmacotherapy has the strongest evidence for reducing behavioral problems and improving attention and educational performance (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 a very effective treatment for ADHD, the potential difficulties with obtaining comprehensive assessments of the children to ensure accurate diagnosis, combined with 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.

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, the second-generation antipsychotics—is increasing (Pringsheim and Gorman, 2012) in children and adolescents with disruptive behavioral disorders. The review found that 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 IQs (Duhig and others, 2013), but 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. Lithium was found to have a short-term impact similar to that of risperidone. The overall recommendation from the reviews cited is that 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).

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

- ***Cognitive Behavioral Interventions***. 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 and others, 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 of parenting interventions was 0.47 and of CBI was 0.35 (McCart and others, 2006). This review concluded that parental training appeared to have greater impacts on younger children and that CBI was more effective in adolescents. Anger-control training is a variant of CBI and has been predominantly used with demonstrated effectiveness in primary school-aged children (Handwerk and others, 2012).
- ***Problem-Solving Skills Therapy***. PSST is an individual-based intervention for children and adolescents that focuses on changing the way the children interact with the significant others in their lives. The existing evaluations of this type of therapy have predominantly been carried out by Alan Kazdin and colleagues in the 1990s; these studies have shown the therapy to be largely efficacious and incrementally supportive of the therapeutic effects of parenting 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 effectiveness of parenting interventions incrementally (Handwerk and others, 2012).

- ***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 and others, 2004). However, its highly intensive nature may render it unsuitable as an intervention in all health care contexts.

Handwerk and others (2012) provide an excellent summary of the literature regarding interventions targeting conduct disorders. The overall recommendations include parental 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 of 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.

Extended Cost-Effectiveness Analysis

The evidence base regarding 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. The majority of studies were conducted in the United Kingdom or the United States and used cost-effectiveness frameworks, which expressed outcomes as clinical units, such as the cost per point improvement on a symptomatic scale. Relatively fewer studies use a cost-utility analysis framework (CUA), 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 CUA is that value-for-money judgements 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 both within and across different disorder categories. The review by Kilian and others (2010) found a total of 10 CUAs, mainly evaluations of pharmacological interventions for ADHD, although another seven studies have been published since this review. The more recent studies have evaluated behavioral and psychosocial interventions for internalizing disorders, such as depression and anxiety; a few have targeted externalizing disorders, such as conduct disorder.

Studies of pharmacological interventions for ADHD have largely found such interventions to be cost-effective (King and others, 2006). The evaluations of behavioral interventions have also found such interventions to be cost-effective; for example, Dretzke and others (2005) found that parenting interventions for conduct disorder was cost-effective. A similar conclusion has been reached by Mihalopoulos and others (2007) who found that very modest improvements in symptoms of conduct disorder can be associated with considerable cost-savings that outweighed 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 indices, such as QALYs, in children with mental disorders, as well as the difficulties in assessing costs. Future research to begin to fill this evidence gap is urgently needed.

Conclusions

Childhood mental and developmental disorders globally account for a significant health and societal burden. 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 and maternal mental health interventions. 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 limit their 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 reducing bullying in schools are important preventative strategies for childhood mental disorders. The systems required for child protection are complex and require intersectorial collaboration and significant government investment. Further research of 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 and maternal mental health interventions in all countries is recommended to achieve a meaningful reduction in the global prevalence and burden of childhood and developmental disorders.

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