



Prevention of emotional problems and psychiatric risks in children of parents with a mental illness in the Netherlands: I. The scientific basis to a comprehensive approach

Clemens MH Hosman,^{1,2} Karin TM van Doesum^{1,3} and Floor van Santvoort¹

1. Prevention Research Centre, Radboud University Nijmegen, The Netherlands

2. Department of Health Education and Promotion, Maastricht University, The Netherlands

3. Community Mental Health Centre Dimence in Deventer, The Netherlands

Abstract

Children of parents with a mental illness are at significant risk of developing mental disorders and other adverse outcomes at some point in their lives compared to children of healthy parents. During the last 20 years, a comprehensive preventive program for children of parents with a mental illness has been developed in the Netherlands through a longstanding national collaboration between prevention practitioners and scientists. This science- and practice-based program has been implemented by all mental health centres throughout the country (see van Doesum & Hosman, 2009 in this issue). This article describes the scientific underpinnings of this multicomponent program. First, the available epidemiological evidence on risk and the impact on children are discussed, regarding whether parental problems result in similar problems in children (i.e., disorder-synchronous outcomes) or in broad-spectrum outcomes. The article further presents the developmental model of transgenerational transmission of psychopathology and discusses the major mechanisms of risk transmission and the evidence-based risk and protective factors linked to these mechanisms. It finally discusses some implications and future challenges for research, knowledge innovation and implications for program development.

Keywords

children of parents with a mental illness; family; children; prevention; mental health; risk and protective factors

Introduction

Studies over the past four decades have established a strong connection between mental illness among parents and increased lifetime psychiatric risk for their children. The transgenerational transmission of mental illness represents one of the most significant causes of psychiatric morbidity. Over the last twenty years, a comprehensive preventive approach has been developed in the Netherlands to support children of parents with a mental illness (COPMI) and their families by offering a wide range of preventive services, mostly from community mental health centres (see van

Doesum & Hosman, 2009 in this issue). From the start, the approach was jointly developed by practitioners and scientists, using a combination of bottom-up and top-down strategies guided by scientific evidence about intergenerational transmission of psychopathology, process evaluation and outcome studies. These studies have been conducted mainly by the Prevention Research Centres of the Radboud University Nijmegen and the National Institute for Mental Health and Addiction (Trimbos Institute) and were facilitated by the national Prevention Research Program of the Dutch Health Research and Development Council.

Contact: Clemens M.H. Hosman, PhD, Prevention Research Centre, Radboud University Nijmegen, Postbox 9104, 6500 HE Nijmegen, The Netherlands. hosman@psych.ru.nl

Citation: Hosman, C.M.H., van Doesum, K.T.M., & van Santvoort, F. (2009). Prevention of emotional problems and psychiatric risks in children of parents with a mental illness in the Netherlands: I. The scientific basis to a comprehensive approach. *Australian e-Journal for the Advancement of Mental Health*, 8(3), <http://amh.e-contentmanagement.com/archives/vol/8/issue/3/article/3514/prevention-of-emotional-problems-and-psychiatric>

Published by: *Australian Network for Promotion, Prevention and Early Intervention for Mental Health (Auseinet)*
www.auseinet.com/journal

Received 2 September 2009; Revised 24 November 2009; Accepted 24 November 2009

The aim of this article is to summarise the knowledge base of the Dutch prevention policy and program for COPMI, in particular the knowledge on malleable risk and protective factors in the transmission of psychiatric and related problems from parents to children. We present a developmental theoretical model that serves as a framework to integrate the extensive knowledge on these transmission processes from the fast growing number of studies in this field. The model is also used to guide the development of the comprehensive Dutch program as a whole. The major assumption is that an effective approach to reducing the risk of psychiatric problems and enhancing the social-emotional development of children of parents with a mental illness needs to be grounded in practice-based and theory-based knowledge and related evidence.

Epidemiology and impact on children

The need to prioritise COPMI in our national and local prevention and health promotion policies is based on knowledge from a wide range of sources, including epidemiological and clinical studies, clinical and preventive practices and extensive contacts with these children and their families. These all pointed to the conclusion that children of parents with a mental illness are at much higher risk of developing mental disorders and other adverse outcomes at some point in their lives than are children of healthy parents. Longitudinal studies have shown that the risk of developing mental disorders among these children ranges from 41% to 77% (Beardslee, Keller, Lavori et al., 1993; Downey & Coyne, 1990; Goodman, Adamson, Riniti & Cole, 1994; Orvaschel, Walsh-Allis & Ye, 1988; Rutter & Quinton, 1984; Weissman, Wickramaratne, Warner et al., 1987). Evidence for this elevated risk has been found across the whole diagnostic spectrum of parental psychiatric disorders, including substance abuse (Cuijpers, Langendoen & Bijl, 1999; Edwards, Eiden & Leonard, 2006; Steinhausen, 1995), anxiety disorders (Beidel & Turner, 1997; O'Connor, Heron, Golding et al., 2002), panic disorder (Biederman, Faraone, Hirshfeld-Becker et al., 2001), obsessive compulsive disorder (Black, Gaffney, Schlosser & Gabel, 2003), depression (Beardslee, Versage & Gladstone, 1998; Weissman, Wickramaratne, Nomura et al.,

2006), dysthymic disorder (Lizardi, Klein & Shankman, 2004), bipolar disorder (Birmaher, Axelson, Monk et al., 2009; DeBello & Geller, 2001), eating disorders (Park, Senior & Stein, 2003), suicide (Bronisch & Lieb, 2008) and personality disorders (Coolidge, Thede & Jang, 2001; Westman, 2000).

For instance, in a study among the offspring (7-12 yrs) of parents with an anxiety disorder, 33% of the children also had an anxiety disorder, compared to 8% of children whose parents had no mental illness (Beidel & Turner, 1997). Rates as high as 40% for the occurrence of major depression by the end of adolescence have been found in offspring of depressed parents (Beardslee et al., 1993). Among children of depressed parents, rates of depression have been found that are from two or three times (Weissman et al., 2006), up to eight times (Wickramaratne & Weissman, 1998) higher than among children whose parents have no mental illness. The Netherlands Mental Health Survey and Incidence Study (NEMESIS) found a lifetime prevalence of abuse/dependence disorders of 28.5% among children of problem drinkers, compared to 17% among children of other adults (Cuijpers et al., 1999). Parental mental illness affects not only the lifetime psychiatric risk of their offspring, but also has multiple mostly related adverse outcomes, such as a higher risk of stress reactivity, living in high-conflict and divorced families, exposure to child abuse and neglect, identity problems, poor academic achievement and school failure, problems in developing intimate relationships, and a higher risk of suicidal behaviour (e.g., Ashman, Dawson, Panagiotides et al., 2002; Cicchetti, Rogosch & Toth, 1998; Goodman & Gotlib, 1999; Leinonen, Solantaus & Punamaki, 2003a).

Children of parents with a mental illness represent a large segment of the population. Even in a small country such as the Netherlands, with 16.5 million inhabitants, there are about 1.6 million of such children younger than 22 years, including 900,000 younger than 12 years of age. Although this group as a whole has been found to be at elevated risk, this does not necessarily apply to all the children, as risk levels may vary significantly within this group. As will be discussed in this article, the level of risk is

highly dependent on the presence of an accumulation of risk factors and the role of protective factors.

Disorder-specific transmissions or broad-spectrum risk?

There is much debate on the question whether the transmission of mental disorders from parents to children is disorder-specific. Are children specifically at risk of developing the same disorders as their parents? Is the transmission dominated by disorder-specific risk factors or do children of parents with different mental disorders share common risk factors which in turn might cause an increased risk for multiple disorders? Answers to these questions are crucial in designing effective prevention programs. For instance, are children of depressed parents in need of different preventive support than those whose parents suffer from a generalised anxiety disorder, alcohol addiction, schizophrenia or a borderline disorder?

There is strong evidence that children of parents with a mental disorder have an increased risk of developing the same disorder as their parents, but there is also overwhelming evidence that these children are at increased risk of developing a wide range of other disorders, reflecting a so-called broad-spectrum effect (Bijl, Cuijpers & Smit, 2002; Lieb, Isensee, Hofler et al., 2002; Lizardi et al., 2004). For instance, longitudinal studies by Wickramaratne and Weissman (1998) found that, compared with children of parents without psychiatric disorders, children of parents with major depressive disorder had an eight times greater risk of childhood-onset and five times greater risk of early-adulthood-onset major depressive disorder, three times greater risk of anxiety disorder, and five times greater risk of conduct disorder and alcohol dependence (Weissman, Warner, Wickramaratne et al., 1997; Weissman et al., 2006). Increased risk of multiple disorders has also been found among children of parents with schizophrenia (Hans, Auerbach, Styr & Marcus, 2004; Keshavan, Montrose, Rajarethinam et al., 2008; Niemi, Suvisaari, Haukka et al., 2004; Tienari, Wynne, Moring et al., 2000) and substance abuse (Clark, Cornelius, Wood & Vanyukov, 2004; Cuijpers et al., 1999; Harter, 2000).

The increased incidence of a variety of disorders in the offspring of parents with a specific

disorder does not necessarily point exclusively to the role of broad-spectrum risk factors. The multiple disorders found in offspring might simply reflect the frequent prevalence of comorbid disorders in parents, as this is common in psychiatric patients in general. For instance, in a study of the offspring of parents with substance abuse disorders by Clark et al. (2004), the increased risk of several disorders in the child sample could be predicted by the corresponding comorbid disorder in the parent.

As a prelude to the discussion of risk factors in the next section, the most likely conclusion from current risk factor research is that both disorder-specific and common factors are responsible for the increased risk of psychopathology in offspring (e.g., Avenevoli & Merikangas, 2006). Disorder-specific risk factors include genetic and biochemical factors, but also parental modelling behaviour and reinforcement of pathological coping styles (e.g., substance abuse, externalising behaviour, emotional eating, overprotective behaviour). Also many common risk factors have been identified in the transmission of risk across different parental diagnoses. They might be common outcomes of the parental disorder (e.g., insensitive responsiveness, neglect, abuse, exposure to family conflict and violence, parentification) or refer to common risk factors influencing the onset of psychopathology in both parents and offspring (e.g., poverty, exposure to neighbourhood violence, substance abuse and domestic violence). Such factors are not only common factors across different parental diagnoses but are themselves likely to increase the risk of a wide range of problems in offspring. For this reason we label them as common or broad-spectrum risk factors. Protective factors that have been found to buffer the impact of risk factors are also mostly not disorder-specific (e.g., care by the other parent, the child's own problem-solving skills, and social support by family, friends or teachers).

These findings suggest that COPMI prevention programs should address both common and disorder-specific factors. Addressing common factors might increase the likelihood of a broad spectrum of favourable outcomes and improve the cost-effectiveness of interventions. In addition, it will increase the feasibility of such

programs. Implementation would be much more complicated should separate interventions have to be provided in relation to each individual parental diagnosis, and recruitment strategies governed by diagnostic labels. We conclude that the situations of the children have much in common across different parental diagnoses. On the other hand, children and their parents might have specific questions and needs relating to the parental disorder (e.g., knowledge about the disorder, how to cope with symptom behaviour). These disorder-specific issues should also be addressed as part of a comprehensive approach.

A developmental model of mental health and psychopathology of offspring

To guide the development of preventive interventions and the overall prevention policy for COPMI in the Netherlands, we developed a theoretical model that describes the main domains of risk and protective factors in the development of mental health and

psychopathology in children of parents with mental illness (see also van Doesum, Hosman & Riksen-Walraven, 2005). This model (Figure 1) is based on a range of principles, mainly derived from the field of developmental psychopathology. Firstly, the model differentiates between multiple interacting domains and systems of influence: parents, children, family, social network, professionals and the wider community. To each of these domains, specific risk factors and protective factors are linked, providing the basis for identifying relevant intervention targets. Secondly, in line with other scientists working in this field (Goodman & Gotlib, 1999), we differentiate between various mechanisms of transgenerational risk transmission: (a) genetic risk transmission, (b) prenatal influences, (c) parent-child interactions, (d) family processes and conditions, and (e) social influences from outside the family.

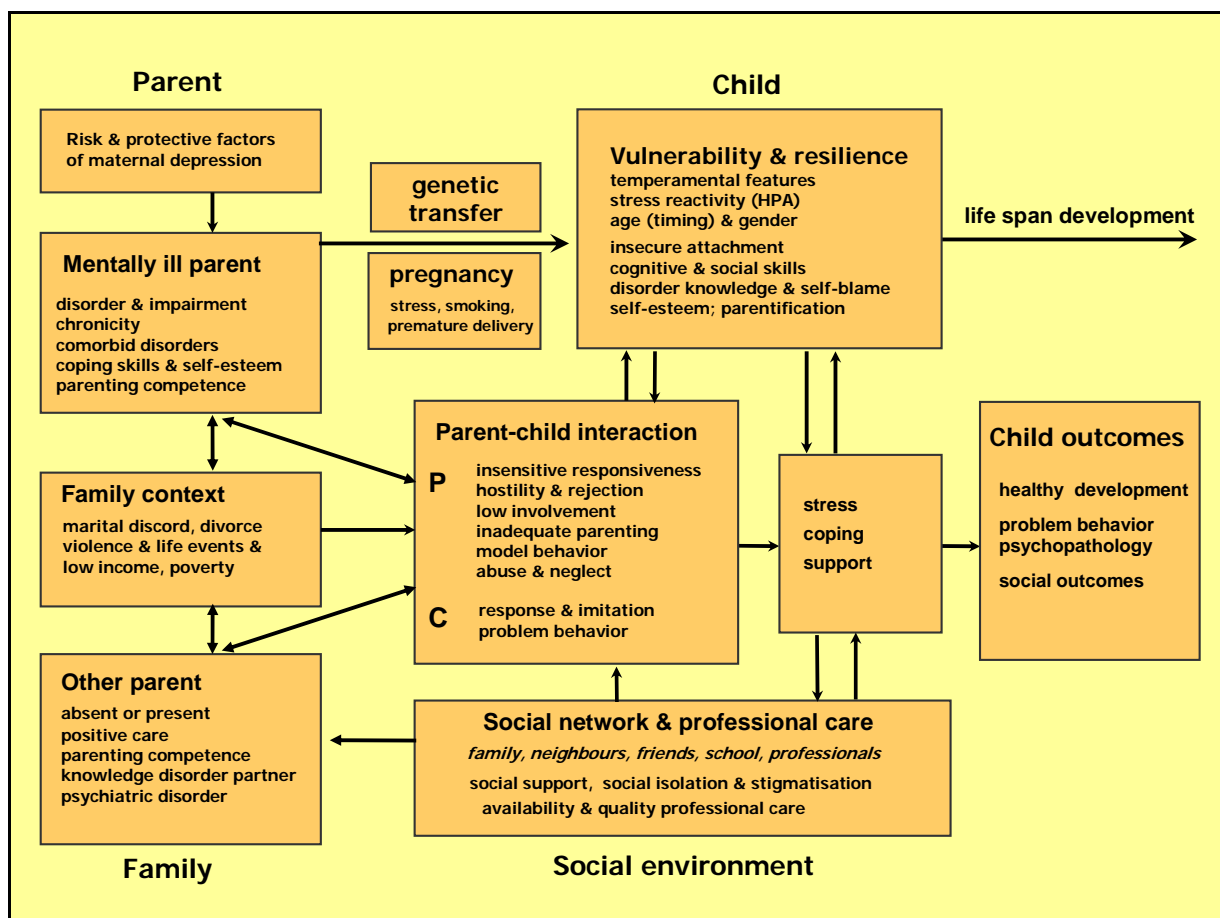


Figure 1. A developmental model of transgenerational transmission of psychopathology

Thirdly, the theoretical framework differentiates between developmental stages in the child's life, starting from pregnancy. Each stage is assumed to be linked to specific developmental processes and tasks, sensitive periods and age-related onset of risk factors and psychiatric disorders. Together they point to the need to develop multiple preventive interventions along the life span, each tailored to the developmental needs and risks of a specific stage.

Fourthly, the concepts of equifinality and multifinality are used to describe two major views on cause-and-effect relations in the developmental trajectories of psychopathology. Equifinality refers to the view that a single disorder or problem can be the result of multiple causes or developmental trajectories. This means that a specific disorder in the offspring (e.g., depression) can be the result of different risk trajectories and the exposure to different types of parental diagnosis. The concept of multifinality is based on the notion that a particular risk factor (e.g., a specific parental diagnosis) can result in multiple outcomes such as multiple types of disorders or social outcomes in children. This means that targeting risk factors or protective factors that are common across children and families with different parental diagnoses is a feasible prevention strategy that might result in a wide range of favourable outcomes. Ample empirical evidence for both concepts has been found in developmental psychopathology research, as reflected in numerous articles in the peer-reviewed journal *Development and Psychopathology*.

Fifthly, the model aims to provide both insight into the development of psychiatric and related problems in children of parents with a mental illness, as well as into the conditions promoting their resilience and social-emotional development. Sixthly, we have used this framework to organise and integrate the current knowledge from numerous empirical studies that have been published on this subject in the last two decades. Finally, the model and the related knowledge base are used for translational research; that is, to identify and study opportunities for preventive interventions and to guide the development of effective multi-component programs and a comprehensive prevention policy for COPMI.

The next sections summarise some of the main findings from empirical research linked to the main domains in the model. Limitations of space prevent us from discussing each risk factor and protective factor in detail. Instead, we summarise major findings and discuss some illustrative studies.

Parent-related factors

Characteristics of parental psychopathology predicting increased risk

In addition to the mere presence of a mental disorder in a parent, studies have identified several characteristics of parental mental illness that are associated with increased risk in offspring, such as chronicity of the disorder, parental age of onset, timing in the developmental stages of the child, family history of psychopathology, comorbidity and psychopathology in both parents.

Many studies have replicated the finding that children exposed to recurrent and chronic parental disorders are especially at risk (e.g., Ashman et al., 2002.; Ashman, Dawson & Panagiotides, 2008; Beardslee, Schultz & Selman, 1987; Foster, Webster, Weissman et al., 2008; Horwitz, Briggs-Gowan, Storfer-Isser & Carter, 2007). For instance, among mothers suffering from postnatal depression or a later depressive episode without subsequent episodes, some studies found no increased risk of depression in offspring (Halligan, Murray, Martins & Cooper, 2007). There is some evidence showing that the presence of multiple disorders (comorbidity) in parents increases the risk in offspring (Goodman, 2007; Kim-Cohen, Caspi, Rutter et al., 2006). Ample evidence exists for the impact of both parents having a mental disorder. When both parents suffer from the same disorder, the risk for this disorder in offspring is higher than when only one parent is afflicted. This risk increase is larger in the case of bipolar disorders (Birmaher et al., 2009) and substance abuse disorders (Clark et al., 2004) than in the case of major depression (Lieb et al., 2002). The NEMESIS study ($N = 7,076$) found a lifetime prevalence of psychiatric disorders from 48% to 55% in the offspring of parents with a history of a single psychiatric disorder (Bijl et al., 2002). When both parents suffered from psychopathology, the risk increased to 66.5%.

The age of onset of parental disorders has also been found to have predictive value. In their longitudinal study, Wickramaratne and Weissman (1998) found a much higher relative risk of depression in offspring when the onset of the parental depression occurred before the age of 30, compared to a later onset (RR = 13.1 versus RR = 4.1). This could be caused by a stronger impact of genetic factors in early transmissions of psychopathology; it also could refer to the significant impact of adverse social circumstances and maternal psychological vulnerabilities frequently found in young, especially teenage mothers. In addition, the timing of exposure to a parental mental illness across the child's life span influences both the type of impact on the child and the level of risk. Most of the current knowledge suggests that the largest impact occurs during the early stages of the child's life span, including the pregnancy period. This might be attributable to the impact of disorder-related parental behaviour and exposure to early stressors that interfere with a healthy development of cerebral functioning and emotion-regulation systems (Maughan, Cicchetti, Toth & Rogosch, 2007; Ronsaville, Municchi, Laney et al., 2006).

Risk factors during pregnancy

Several studies have identified risk factors during pregnancy. High levels of stress and anxiety during pregnancy impair the functions of the growing brain and emotion-regulation systems in the HPA-axis, and increase the risk of high stress reactivity and emotional and behavioural problems during childhood and adolescence (e.g., Ashman et al., 2002; Huizink, Robles de Medina, Mulder et al., 2003; O'Connor et al., 2002; Robinson, Oddy, Li et al., 2008; Ronsaville et al., 2006; Van den Bergh & Marcoen, 2004). Such stress can be caused by high levels of antenatal anxiety, bereavement and other loss experiences, but also by economic hardship, domestic violence or divorce, not uncommon in the context of parental disorders. These conditions might also be responsible for risk behaviours, such as smoking and alcohol use during pregnancy, which have a proven negative impact on children's functioning and may cause problem behaviour up to adolescence (e.g., Wakschlag, Pickett, Cook et al., 2002).

Parenting competence and parent-child interaction

As many studies have found, the transgenerational transmission of psychiatric risk is significantly mediated by the way parents interact with their children and by poor parenting skills. Parental psychopathology increases the likelihood of insensitive responsiveness, low involvement with their children, low monitoring or even hostility, rejection and child maltreatment (e.g., Bifulco, Moran, Ball et al., 2002; Duggal, Carlson, Sroufe & Egeland, 2001; Elgar, Mills, McGrath et al., 2007; Harnish, Dodge & Valente, 1995; Leinonen et al., 2003a; Murray, Cooper & Hipwell, 2003). It is especially when these behavioural patterns are present during the early years of life that they trigger dysregulated emotion patterns, negative emotionality, insecure attachment and decreased perceived competence in children (Hipwell, Goossens, Melhuish & Kumar, 2000; Maughan et al. 2007; Rogosch, Cicchetti & Toth, 2004). These outcomes have been found across different parental diagnoses, such as major depression, anxiety disorders, substance abuse disorders, antisocial personality disorder and borderline personality disorder (e.g., Leinonen et al., 2003a).

Parents might also provide children with pathological model behaviour and coping styles over a prolonged period, which will be copied by their offspring, for instance in the case of emotional eating and the use of alcohol as a mood manager. There is also evidence that these behavioural risk factors are transmitted across multiple generations. Parents who show neglectful, abusive or violent behaviour have frequently themselves been a victim of such behaviours during their childhood (Sidebotham & Heron, 2006). Positive parenting was found to have a protective influence on the development of future conduct problems in children of depressed mothers (Chronis, Lahey & Pelham, 2007). This stresses the relevance of parent education as a valuable preventive strategy.

Family conditions

Enduring family discord, domestic violence, financial hardship and family-related life events could be both consequences of and risk factors for parental psychopathology. Depending on severity and duration, the presence of a mental

disorder in one of the parents could have a profound impact on marital relationships and family life. Several studies have found that such conditions mediate the impact of parental disorders on a child (e.g., Ashman et al., 2008; Avenevoli & Merikangas, 2006; Cicchetti et al., 1998; Leinonen et al., 2003b).

Also when they do not play a mediating role (i.e., when they are present independent of parental psychopathology), these conditions moderate the risk in offspring and contribute to an accumulation of risk factors in the child's life. Irrespective of the type of parental disorder, a well-evidenced relationship has been found between the number of risk factors and the onset of psychopathology in offspring (Appleyard, Egeland, van Dulmen & Sroufe, 2005; Dickstein, Seifer & Hayden, 1998; Nair, Schuler, Black et al., 2003; Rutter & Quinton, 1984; Whitaker, Orzol & Kahn, 2006). It is not yet clear whether this is a linear relation, or a curvilinear relation indicating a threshold effect. This suggests that identifying the presence of an accumulation of risk factors and reducing their number might be a suitable preventive strategy for COPMI.

The influence of another parent could play a protective role or could represent an additional risk factor. For instance, the presence of a parent who is caring and supportive to the child and understands the disorder of the partner can successfully buffer the negative impact of a maternal depression (Chang, Halpern & Kaufman, 2007; Crockenberg & Leerkes, 2003). However, if the partner also suffers from a mental disorder or shows violent or abusive behaviour, this will further increase the risk to the child (e.g., Birmaher et al., 2009; Clark et al., 2004). In the case of one-parent families, not uncommon in the case of COPMI, support from the other parent might be totally absent.

Child-related factors

The children themselves also play an important role in determining the impact of their familial or parental situation. Vulnerable children run an increased risk in the context of adverse life conditions (e.g., parental mental illness), while highly resilient children do well even under harsh conditions (e.g., Werner & Smith, 2001). The major child-related risk factors identified in multiple studies include: difficult temperament, behavioural inhibition, negative emotionality,

stress reactivity, insecure attachment, negative self-esteem, poor cognitive and social skills, lack of knowledge about the parental disorder, parentification and self-blame (see reviews by Beardslee & Podorefsky, 1998; Goodman & Gotlib, 1999; Gopfert, Webster & Seeman, 2004).

Vulnerabilities can operate *as mediating factors* between parental mental illness and the child's risk of psychopathology when these vulnerabilities result from exposure to parental behaviour or other risk factors associated with the parental disorder. For instance, several studies suggest that insecure attachment mediates the relation between parental psychopathology and socio-emotional development in children (Cicchetti et al., 1998; Rangarajan, 2008). Vulnerabilities might also be present independent of a parental disorder and function as moderators of the impact of a parental disorder on the child.

Vulnerabilities in mentally ill parents might be transmitted genetically to their children (e.g., temperamental features), and might be counterbalanced by resilient characteristics inherited from one or both parents. Even when genetic risks are present, current genetic research suggests that their expression is influenced by interactions between genetic factors, neurobiological processes and environmental conditions (Caspi & Moffitt, 2006; Rutter, Moffitt & Caspi, 2006). Some biological processes and conditions might be modified through preventive interventions. For instance, neurobiological functioning during pregnancy in depressed mothers has been successfully influenced through massage (Field, Hernandez-Reif, Deeds & Figueiredo, in press). Prenatal massage therapy was found to reduce postpartum depression, as well as lower cortisol levels and improve neonatal behaviour in newborns.

Resilience factors refer mainly to the opposite of these risk factors; for example, positive emotionality, safe attachment, cognitive and social competence, positive self-esteem, self-reliance, relevant knowledge about parental disorders, and perceived social support (e.g., Beardslee & Podorefsky, 1988; Hammen, 2003). Although the preventive role of resilience factors in the socio-emotional development of children has been extensively studied and recognised

within the realm of developmental psychology and positive psychology, surprisingly little research has been done to study their role in the transmission of parental psychopathology. An illustrative example of this research is offered by Silk, Shaw, Forbes et al. (2006) in a recent study on the role of emotion regulation in children of depressed mothers, aged 4 to 7. Findings suggest that positive reward expectation in children has a significant protective influence on the development of internalising problems in a context of maternal depression.

Prevention and health promotion efforts targeted at children and their families may strengthen the resilience of the children and reduce their vulnerability. Firstly, environmental risk and protective factors during pregnancy, infancy and later stages as discussed in this article could be targeted to enhance the development of resilience and to prevent the onset of vulnerability factors in children. Examples of malleable determinants of socio-emotional vulnerabilities in children include maternal stress, depression and anxiety during pregnancy, early maternal insensitivity, lack of parental warmth and child abuse and neglect (e.g., Huizink et al., 2003; Ronsaville et al., 2006; van Doesum, Riksen-Walraven, Hosman & Hoefnagels, 2008). Secondly, screening of vulnerability and resilience features in children can be used to target directly child-based risk factors that are already present and to enhance the children's strengths in the context of parental mental illness.

Finally, as stated earlier, one may conclude that the outcomes of exposure to parental mental illness are related to the age and developmental stage of the child, but that this impact is expected to be most powerful during the first years of life. The moderating role of gender has also been the subject of numerous studies. It is evident that gender plays a moderating role, especially in predicting the risk of internalising versus externalising problems in offspring, but its impact seems largely dependent on contextual factors (e.g., parental gender, family composition).

Factors in the extrafamilial environment: networks, community and care

Just as in other domains, the social environment outside the family can play both a protective and

a risk-increasing role for children of parents with a mental illness. Most knowledge about the factors in this domain has come from retrospective and qualitative studies, such as in-depth interviews with adolescents and adult children of parents with mental illness (e.g., Drijver & Rikken, 1989; Knutsson-Medin, Edlund & Ramklint, 2007). Social networks may offer cognitive, emotional and practical support to both parents and children, for instance by providing compensatory care when a parent is actually or emotionally non-available, or by offering parenting advice, a listening ear or opportunities for respite and experiencing positive events. Network persons could include grandparents, neighbours, friends, teachers or peers living in similar circumstances. A large-scale prospective study in the US showed that the onset of internalising problems in children of depressed mothers was lower when the mothers received social support and the children received care from caregivers other than the mother (Lee, Halpern, Hertz-Picciotti et al., 2006).

Schools are regularly identified by children of parents with a mental illness as settings where they can escape from harsh family circumstances and where they can find opportunities for diversion and positive experiences. Schools, neighbourhoods and social networks can also become a source of additional stress and social isolation, due the prevalent stigma attached to mental illness. Children report frequent exposure to negative responses from peers including bullying, and are reluctant to take friends home.

A common complaint of children is the lack of attention and support they get from the mental health professionals treating their parent. These complaints have been reported in studies in the US, Sweden, New Zealand, Australia and the Netherlands (e.g., Drijver & Rikken, 1989; Fudge & Mason, 2004; Knutsson-Medin et al., 2007). From our own experiences in mental health care, it is obvious that there is a widespread lack of awareness and sensitivity, especially among professionals in adult care, regarding the impact that problems of adult patients have on their children. Even when such awareness exists, children do not get the support they deserve due to a lack of child-targeted skills among professionals treating adults and the lack of collaboration between adult therapists and

child care. Lack of support and information about the parent's condition might increase the likelihood of self-blame and parentification.

In sum, factors in each of the domains of our model contribute to the socio-emotional development of offspring of parents with a mental illness. The multicausality of the risk in the children stresses the need to assess carefully the accumulation of risk factors within and across domains, and the interactions between risk factors and protective factors. This multicausal context, as summarised in Figure 1, offers a wide range of options for preventive interventions to reduce transgenerational transmission of psychiatric risks and to enhance positive socio-emotional development.

Conclusions and implications

Although this review does not aim to cover all relevant epidemiological and developmental studies that have been published, it makes clear that the transmission of psychiatric problems from parents to children is extensively studied, especially during the last two decades. There exists a fast growing body of knowledge that could be used to guide the development of effective interventions and a comprehensive approach that aims to reduce psychiatric and other risks in children of parents with a mental illness and to promote their healthy emotional development. In this last section we highlight some major conclusions, discuss their implications and identify further needs for research.

Estimating the level of risk

The estimated level of risk varies widely across studies, depending on the features of the population under investigation, study design and length of time over which the risk is calculated. A more systematic comparison of risk levels across studies is needed to make estimations of the public mental health gains that could theoretically be derived from a highly effective and comprehensive prevention strategy. However, irrespective of the variations in expected risk level, longitudinal epidemiological studies have generally shown that the transmission of psychiatric problems from parents to children is responsible for a significant part of new psychiatric morbidity and lost opportunities for offspring to develop resilience

and positive mental health. This phenomenon seems true independent of parental diagnosis. As the number of children of parents with a mental illness in the population and their risk level are substantial, and the outcomes of living with a parent with a mental illness can be pervasive, making this group a priority target for local and national public health policies seems warranted.

Risk and protective factors

As summarised in this review, several causal mechanisms and a wide range of mediating and moderating risk factors play a role in the transmission of psychiatric and related problems from parents to children. Both risk and protective factors are located in the child, the parents, the social network and the wider social environment (see Figure 1). Multiple studies have shown that parental disorders and risk factors might have a broad-spectrum effect, increasing the risk of a range of different outcomes and disorders in the child. Many of these factors seem malleable and together they offer a wide window of opportunities to intervene in the transmission process, to reduce the risk of adverse outcomes and to enhance positive social-emotional development in offspring.

Given its possible implications for developing prevention programs and policies, it seems important to better understand the similarities and dissimilarities of the transmission processes across different parental diagnoses. For instance, are children of parents suffering from chronic depression, anorexia nervosa, substance abuse or schizophrenia exposed to similar risk factors, indicating the need for common preventive interventions; or do risk factors and needs for support vary between these diagnoses? Current preventive interventions for children and their families are dominantly based on the assumption that they share common needs, such as getting recognition for their problems, information on the parental illness, breaking through the circle of silence, learning to communicate about the illness and to deal with stigma, and improving parenting skills and social support. COPMI interventions address children of different parental diagnoses mostly as one integral target population, only differentiating in providing knowledge on the specific parental disorder the child is exposed to. Research on outcomes of

parental disorder suggests that the transmission of risk is ruled by both common and disorder-specific risk factors. Specific parental disorders might call for tailored interventions, such as specific training for children in dealing with anxious or paranoid behaviour of a parent, or in educating children about substance use when, as a parent, you are yourself addicted. A more systematic review on outcomes of different parental diagnoses currently being run in a joint research project of the Radboud University Nijmegen (Netherlands) and The Monash University (Australia) could shed more light on this issue.

On the one hand, this review underscores the need to base our prevention practices and policies on a deeper knowledge of all the individual factors and processes that influence the emotional and social development of children of parents with a mental illness. On the other hand, the discussed work largely supports Rutter's original finding (Rutter & Quinton, 1984) that the impact of parental mental illness is influenced by the mere number of accumulating risk factors: the more risk factors, the higher the risk for the children. This finding is in line with our conclusion that children vary widely among each other in their level of risk. A subset is doing reasonably well or increasing their resilience when a healthy balance is present between risk and protective factors. This approach might have several implications for practice. First, more attention should be given to the assessment of risks and strengths in children and their families to identify which are in serious need of intensive preventive support due to an accumulation of risk factors, and which are not or could be sufficiently supported by simple interventions (e.g., information through the internet). Redefining 'need' in this way might generate more tailored and thus more effective interventions, and might also reduce the problem of limited resources and low reach of COPMI interventions as currently reported across multiple countries. This approach identifies two further research priorities, namely the need for valid risk assessment tools applicable in daily practice and for knowledge on levels of risk factors that are normal for children and levels of accumulated risks that seriously threaten their social-emotional development. Some risk factors, such as chronic disorders, might trigger a

chain of accumulating adverse conditions for the child.

Value of a theoretical framework

Those who are involved in program development and practice to support children and families living with mental illness are confronted with an expanding body of research outcomes that might be hard to oversee and integrate. The theoretical model we have developed and presented in this article (see Figure 1) aims to support policy makers, program designers, practitioners, consumers and researchers with a framework in multiple ways. According to our Dutch experiences, it could help to (1) organise the multiple science-based and practice-based findings in a transparent way, and better understand the mediating and moderating interrelations between causal factors (developmental trajectories), (2) identify opportunities for new preventive interventions and mental health promotion, develop 'program theories' and improve the effectiveness of existing interventions, (3) design a comprehensive, multipronged policy that respond to the multicausal pathways influencing the wellbeing of the children, (4) evaluate the multiple outcomes of COPMI interventions, and (5) identify gaps in our current knowledge and formulate new research questions on the mediating and moderating processes in the relation between parents with a mental illness and their offspring.

Needs for further research

In the above discussion several research needs have been identified, related to relative and absolute levels of risk, impact of the type of parental disorder, and critical thresholds in the number of accumulating risk factors. In expanding the knowledge base for designing effective prevention programs and policies, more knowledge is needed on the influence of sensitive periods along the life span where risk and protective factors might have a significantly stronger and more long lasting impact than in other periods (e.g., pregnancy, infancy, and early adolescence). We further conclude that the outcomes of certain parental mental illnesses have been extensively studied (e.g., depression, substance use) while substantial knowledge is lacking on the impact of other parental disorders, such as in the case of prevalent personality

disorders (e.g., borderline). The same applies to children of incarcerated forensic patients, who are hard to reach due to the additional stigma linked to parental criminal history.

In sum, the growing insight into the processes that mediate and moderate the transmission of risks and strengths from parents with a mental disorder to their children offers perspectives for developing a comprehensive and effective preventive approach. Sharing across countries science-based and practice-based knowledge and how this knowledge can be used for practice and policy, as was the aim of this article, hopefully contributes to improving the lives of future generations of children of parents with a mental illness.

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