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Child and Adolescent Mental Health and Well-Being in Germany – Trajectories, Determinants, and Vulnerable Populations

Dissertation

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Good mental health and well-being are essential for all of us to lead fulfilling lives,
to realise our full potential, to participate productively in our communities,
and to demonstrate resilience in the face of stress and adversity.

Dr. Tedros Adhanom Ghebreyesus
Director-General World Health Organisation
(WHO, 2021, Forword).

No arguments and quarrels, nowhere,
and lots of fun at school
and when playing [alone or with friends].

Our 8-year-old son,
in response to the question:
What does it mean to be happy?

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Table of Content

I Synopsis 7
1. Publications Included in This Thesis 8
2. Theoretical Background 10
2.1. The Origins of Paediatric Mental Health and the Search for Determinants 10
2.1.1. Early Contributions 11
2.1.2. Child Guidance Clinics and the Recognition of the Multifaceted Environment as a Factor Shaping Child and Adolescent Mental Health 11
2.1.3. Child Attachment to the Caregiver 12
2.2. From the Study of Adverse Environments to Resilience 13
2.2.1. the Avenue of Research on Risk Environments 13
2.2.2. Risk and Protective Factors and the Study of Resilience 14
2.3. Epidemiological Approach to Child and Adolescent Mental Health 15
2.3.1. The Emergence of a Global Approach on Child and Adolescent Mental Health 15
2.3.2. The Need for Epidemiological Studies 17
2.4. Definitions and Measures of Child and Adolescent Mental Health Problems and HRQoL 19
2.4.1. Defining Child and Adolescent Mental Health Problems 19
2.4.2. Defining Child and Adolescent HRQoL 19
2.4.3. Measuring Child and Adolescent Mental Health Problems 20
2.4.4. Measuring Child and Adolescent HRQoL 21
2.5. Modern Research on Child and Adolescent Mental Health in Germany 21
2.5.1. Epidemiological and Population-Based Studies in Germany 22
2.5.2. The BELLA Study 23
2.6. Trajectories, Determinants, and Vulnerable Groups in Child and Adolescent Mental Health and Well-Being 24
2.6.1. Prevalences and Longitudinal Assessments of Child and Adolescent Mental Health 25
2.6.2. Risk and Protective Factors for Child and Adolescent Mental Health 26
2.6.3. Children and Adolescents of Parents with Mental Health Problems 27
2.6.4. Children and Adolescents with Externalising Mental Health Problems 28
2.6.5. HRQoL in Children and Adolescents 29
3. Aims and Research Questions 31
4. Method 33
4.1. BELLA Study Sample 33
4.2. Measures 34
4.2.1. Child and Adolescent Mental Health and HRQoL 35
4.2.2. Risk Factors for Mental Health and HRQoL 36

4.2.3. Protective Factors for Mental Health and HRQoL 38
4.2.4. Risk Behaviour in Young Adults....39
4.2.5. Sociodemographic Variables 40
4.3 Statistical Analyses....41
5. Results 43
5.1. Trajectories of Internalising and Externalising Mental Health Problems in Children and Adolescents 43
5.2. Children of Parents with Mental Health Problems – Prevalences and Risk Constellations 58
5.3. Children of Parents with Mental Health Problems – Protective Factors....76
5.4. Long-Term Outcomes in Early Adulthood of Externalised Mental Health Problems in Adolescence 89
5.5. Parental and Child and Adolescent Mental Health Problems and Protective Factors Affecting Child and Adolescent HRQoL Over Time 103
6. Discussion 129
6.1. Summary and Discussion of Results 129
6.2. Implications and Directions for Future Research, Prevention, and Intervention ..134
6.3. Methodological Strengths and Limitations 136
VII List of Abbreviations 138
VIII List of Figures....139
IX References 140
X Summary in English and German....154
XI Declaration of Own Contribution to the Publications 156
XII Comprehensive List of Publications by A-C. Haller 159
XIII Curriculum Vitae....162
XIV Statutory Declaration / Eidesstattliche Versicherung 165

I Synopsis

This cumulative doctoral thesis represents the outcome of the research I conducted on child and adolescent mental health and health-related quality of life while working at the research section Child Public Health at the University Medical Centre Hamburg-Eppendorf in Hamburg, Germany. My doctoral thesis aims to add to the body of literature on child and adolescent mental health and well-being in Germany, utilising data from the representative national cohort study, The Behaviour and Wellbeing of Children and Adolescents in Germany – BELLA study. My interest in child and adolescent mental health has been long-standing and is rooted in the recognition that early life stages are critical for establishing the foundations of long-term psychological well-being. This aligns with the emphasis the World Health Organisation (WHO) has consistently had regarding the importance of addressing mental health among children and adolescents (WHO, n.d.-a). Childhood and adolescence are critical periods for mental health development, during which brain maturation and the development of cognitive and socio-emotional skills significantly influence overall well-being (WHO, n.d.-a). Children and adolescents represent one of the most vulnerable segments of the population; they depend on the support, protection, and guidance of their caregivers and on the existing broader societal structures. With this thesis I would like to contribute to the safeguarding of the psychological and emotional development of children and adolescents by providing relevant, population-specific data that can inform tailored prevention and intervention strategies and programmes for specific groups.

Chapter 1 lists the five publications this cumulative thesis is comprised of. Chapter 2 provides an overview of the theoretical foundations and the body of research that inform this thesis. The next chapter (Chapter 3) outlines the central aims and main research questions that guide this dissertation. Chapter 4 outlines the methodological approaches used to address the research questions presented in Chapter 3. The next chapter (Chapter 5) summarises each publication succinctly, followed by the respective original articles. Chapter 6 finally interprets the findings of this thesis in the context of the existing literature and highlights their contribution in respect to this thesis' research questions.

1. Publications Included in This Thesis

My cumulative doctoral thesis includes five publications that focus on the following topics related to children and adolescents' mental health and well-being:

1. Trajectories of child and adolescent internalising and externalising mental health problems over the course of childhood and adolescence (Publication 1).
2. Analysis of specific at-risk groups, i.e., families with parental mental health problems and their offspring (Publications 2 and 3), and adolescents with externalising mental health problems (Publication 4).
3. Risk and protective factors influencing HRQoL in children and adolescents (Publication 5).

Find below the list of publications included in this thesis [1]:

Publication 1

Klasen, F., Petermann, F., Meyrose, A.-K., Barkmann, C., Otto, C., **Haller, A-C.**, Schlack, R., Schulte-Markwort, M., & Ravens-Sieberer, U. (2016). Verlauf psychischer Auffälligkeiten von Kindern und Jugendlichen: Ergebnisse der BELLA-Kohortenstudie [Trajectories of mental health problems in children and adolescents: Results of the BELLA cohort study]. *Kindheit und Entwicklung, 25*(1), 10–20.

Publication 2

Haller, A-C., Klasen, F., Petermann, F., Barkmann, C., Otto, C., Schlack, R., & Ravens-Sieberer, U. (2016). Langzeitfolgen externalisierender Verhaltensauffälligkeiten: Ergebnisse der BELLA-Kohortenstudie [Long-term consequences of externalized mental health problems: Results of the BELLA cohort study]. *Kindheit und Entwicklung, 25*(1), 31–40.

Publication 3

Plass, A.*, **Haller, A-C.***, Otto, C., Barkmann, C., Wiegand-Grefe, S., Hölling, H., Schulte-Markwort, M., Ravens-Sieberer, U., & Klasen, F. (2017). Parents with mental health problems and their children in a German population-based sample: Results of the BELLA study. *PLOS ONE, 12*(7), e0180410. https://doi.org/10.1371/journal.pone.0180410

[1] Shared first authorships are indicated by an asterisk *.

Publication 4

Plass, A.*, **Haller, A-C.***, Habermann, K., Barkmann, C., Petermann, F., Schipper, M., Wiegand-Grefe, S., Hölling, H., Ravens-Sieberer, U., & Klasen, F. (2016). Faktoren der Gesunderhaltung bei Kindern psychisch belasteter Eltern: Ergebnisse der BELLA-Kohortenstudie [Factors promoting mental health in children of parents with mental health problems: Results of the BELLA cohort study]. *Kindheit und Entwicklung, 25*(1), 41–49.

Publication 5

Otto, C.*, **Haller, A-C.***, Barkmann, C., Klasen, F., & Ravens-Sieberer, U. (2017). Risk and protective factors of health-related quality of life in children and adolescents: Results of the longitudinal BELLA study. *PLOS ONE, 12*(12), e0190363.
https://doi.org/10.1371/journal.pone.0190363

2. Theoretical Background

The following literature review provides an overview of the theoretical foundations and the scientific research that inform this dissertation. It elaborates on the key themes addressed across the included publications, with a particular focus on child and adolescent mental health and well-being, risk and protective factors influencing mental health outcomes, and vulnerable subgroups within the child and adolescent population. As the data of my publications stem from a large, nationally representative survey conducted in Germany, this literature review also integrates themes related to public health and epidemiology. Chapter 2.1 offers a brief historical overview centred around the key figures and moments related to child and adolescent mental health and its determinants during the late 19th and early 20th century. Chapter 2.2 continues the historical overview by exploring the development of research on adverse environments affecting child and adolescent mental health, as well as the emergence of resilience research. Chapter 2.3. focuses on the emergence of epidemiological approaches to child and adolescent mental health and its determinants and discusses the need for epidemiological and population-based studies. The next chapter (Chapter 2.4) focusses on defining and measuring child and adolescent mental health problems and well-being within the framework of large, population-based studies. Chapter 2.5 shifts its focus to postwar Germany, offering a brief overview of the child and adolescent mental health landscape by presenting key epidemiological studies from recent decades and detailing the first German, nationally representative and longitudinal study in this field, which forms the basis of the publications included in this thesis. Chapter 2.6 finally narrows the focus to the main themes addressed in the publications. It introduces the reader to the prevalences of child and adolescent mental health problems, the research on longitudinal perspectives, and the research on risk and protective factors at the time this thesis was conceived. It also summarises the literature on two vulnerable subgroups: children and adolescents from families with parental mental health problems and adolescents with externalising mental health issues. Finally, the body of literature on child and adolescent HRQoL in Germany is presented.

2.1. The Origins of Paediatric Mental Health and the Search for Determinants

The following chapters provide a historical overview of the study of child and adolescent mental health and its influencing factors, beginning in the late 19th century. Chapter 2.1.1 outlines the foundational contributions of key figures to understanding paediatric mental health and its determinants. Chapter 2.1.2 describes the emergence of a multidisciplinary approach to understanding child and adolescent mental health and its determinants that initially focused on juvenile delinquency, developed in child guidance clinics in the early 20th century. Finally, chapter 2.1.3 presents key figures and their conceptual work on the child-caregiver relationship and its influences on child emotional development arising in the mid-20th century.

2.1.1. Early Contributions

The origins of paediatric mental health can be traced back to the late 19th and early 20th century. Before then, mental health issues in children and adolescents were often overlooked (Rey et al., 2015). Behavioural problems were primarily viewed as a moral weakness or a consequence of poor upbringing that needed punishment (Rey et al., 2015). Mentally ill children and adolescents were either hidden away in the family (Emminghaus, 1887) or institutionalised, rather than provided with treatment (Koplewicz, 1996; Rutter, 1986; Rutter & Taylor, 2002; Wardle, 1991).

One of the earliest contributions to the field came in 1887, when Hermann Emminghaus, a German psychiatrist, published *Psychic Disturbances in Childhood* [*Die psychischen Störungen des Kindesalters*], marking one of the first treatises in child psychiatry (Rey et al., 2025). Emminghaus proposed a more nuanced understanding of behavioural, psychological, and psychiatric issues in children, therefore acknowledging the complexity of childhood mental health. He introduced the idea that hereditary (genetic) influences may be the cause for child mental illness and thus added a biological dimension to the understanding of child mental health. He also discussed the influence of the environment, such as familial poverty, child living and work conditions, as well as neglect and abuse (e.g. parental abuse or at school or in the work environment), on child mental health issues and therefore highlighted how growing up in adverse environments may contribute to the development of mental health problems (Emminghaus, 1887; Nissen, 1986).

A further key contribution to the understanding of child – and in this case in particular adolescent – mental health was made in 1904 when G. Stanley Hall published his book *Adolescence – Its Psychology and Its Relations to Physiology, Anthropology, Sociology, Sex, Crime, Religion, and Education*. In this work, Hall recognised adolescence as a unique developmental stage, marked by significant physical, and intense emotional and psychological change. He pointed out the importance of peer relationships for adolescents and stressed that the psychological challenges of this phase demanded the need for specialised care more attuned to this transitional period of life (Arnett, 1999; Cravens, 2006; Rey et al., 2015).

2.1.2. Child Guidance Clinics and the Recognition of the Multifaceted Environment as a Factor Shaping Child and Adolescent Mental Health

The founding of child guidance clinics in the early 20th century in the United States marked the beginning of organised child and adolescent mental health care (Schowalter 2003). The purpose of these clinics, which later were also established in Europe, was to address juvenile delinquency. By means of a multidisciplinary approach they aimed to understand the causes of juvenile delinquency, improve its prevention, and advance its treatment (Schowalter 2003). The first clinic was founded in 1909 in Chicago by William Healy (Schowalter 2003). Healy,

influenced by Hall, published *The Individual Delinquent* (1915) where he proposed that multiple factors, including developmental, physical, psychological, and environmental, contribute to delinquency (Bakker, 2020).

In the interwar period, child guidance clinics expanded their focus beyond juvenile delinquency and included a broader understanding and approach to child and adolescent mental health. The clinics evolved into multidisciplinary mental health centres, bringing together psychiatrists, psychologists, social workers, and educators to assess and treat children and adolescents with behavioural and emotional challenges. The clinics integrated public health principles as their work shifted toward prevention and early intervention, advocating for early screening, community outreach, and policy advocacy to improve child and adolescent mental health outcomes on a larger scale (Bakker, 2020; Sun et al., 2023). It was during this period that the significance of the multifaceted environment as a determinant of child and adolescent mental health became more widely acknowledged (Black & Gowers, 2005; Schowalter, 2003).

2.1.3. Child Attachment to the Caregiver

The work of John Bowlby and Mary Ainsworth in Great Britain in the mid-20th century and the following decades focused on the importance of the relationship and emotional attunement of the primary caregiver to the child. Bowlby first introduced maternal deprivation theory in the 1940s (Bowlby, 1944; Bowlby 1951), where he proposed that a prolonged separation from the mother during a child's early years results in serious emotional and cognitive damage in the child. As his focus shifted away from the lack of maternal care to the quality of the child-primary caregiver relationship, Bowlby formulated his attachment theory. Bowlby furthermore proposed that infants are biologically programmed to seek closeness with their caregiver as a survival mechanism and to support healthy emotional development (Bowlby, 1969). Ainsworth expanded on Bowlby's work by identifying different attachment styles and highlighting how the caregiver's sensitivity influences a child's capacity to form a secure attachment, therefore shaping the child's emotional development (Ainsworth et al., 1978; Cassidy et al., 2013).

Chapter 2.1 outlined how, between the late 19th century and the mid-20th century, the understanding of paediatric mental health and its determinants gradually evolved. Early perspectives reflected a limited understanding of the factors shaping children and adolescent's mental health, focusing primarily on hereditary influences and relational or socioeconomic conditions, such as neglect, abuse, and poverty. Over time, awareness grew regarding the role of environmental factors in young people's mental health. In the United States, a multidisciplinary approach emerged to understand, treat, and prevent juvenile delinquency, bringing into focus the significance of the multifaceted environment shaping young people's mental health. In Great Britain, attention turned toward the critical role of the

child-caregiver relationship – particularly the caregiver's attunement and sensitivity – and how these factors influence emotional development and mental health.

2.2. From the Study of Adverse Environments to Resilience

The first subsection (Chapter 2.2.1) briefly examines how, shaped by historical developments, the study of factors shaping child and adolescent mental health further transitioned toward a more systematic and empirically driven focus on environmental determinants. Chapter 2.2.2 briefly introduces resilience research and the main insights it generated.

2.2.1. The Avenue of Research on Risk Environments

In the years following World War II, advances in research methods and technology enabled empirical investigations into determinants of child and adolescent mental health – a topic that had previously been addressed primarily within the applied domains of paediatric mental health and care (Rey et al., 2015), as outlined above in Chapter 2.1.1 and 2.1.2. As a result of the historical circumstances, particular attention was given to familial and environmental factors such as family instability and poverty. Empirical studies investigated the effects of e.g., displacement and family separation or loss, on children's emotional and psychological development (Rey et al., 2015). In Great Britain for instance, the Cambridge Evacuation Survey revealed that environmental factors, such as family disruption, separation from parents, and exposure to trauma, negatively impact children's mental health (Loughry & Eyber, 2003; Rey et al., 2015; Rusby & Tasker, 2009; Waugh et al., 2007). In contrast, factors found to protect children's mental health included older age at evacuation, the quality of care in foster homes, and the frequency of contact with the primary caregiver (Rusby & Tasker, 2009), aligning with the Bowlby's research and the principles of attachment theory outlined in Chapter 2.3.1. Another example for the empirical research of factors shaping child and adolescent mental health after World War II is the British National Survey of Health and Development, initiated in 1946. The survey is ongoing and tracks British individuals from birth with the aim to offer insights into how early life factors – such as social class, poverty, and education – impact child development and mental health outcomes (Medical research Council, 2022; Wadsworth et al., 2005). In the early 1960s, the Isle of Wight Study examined children aged 9 to 11 years living on the Isle of Wight (Rutter et al., 1970). The study emphasised the influence of various environmental factors on children's mental health, including low socio-economic status, family disruption, dysfunctional family environment, parental mental health problems, and placement in foster care. The results showed that these factors significantly increased the risk of mental health issues in the children (Rutter et al., 1970).

In summary, the results of empirical and community-based studies conducted in the aftermath of World War II highlighted the relevance of specific risk factors for child and adolescent mental

health. These developments also marked a shift towards an empirically based and more multifactorial understanding of child and adolescent mental health and laid the foundation for the emerging field of resilience research – a field that examines children who show positive mental health despite exposure to adverse environments. The next chapter addresses this in more detail.

2.2.2. Risk and Protective Factors and the Study of Resilience

Research on risk and protective factors for child and adolescent mental health has been significantly informed by the field of resilience and the work of key scholars such as Norman Garmezy, Michael Rutter, and Ann Masten, along with the empirical data derived from their research and the findings they generated. Garmezy's research in the 1960s and 1970s established important principles for the field of resilience (Masten, 2001). He conducted longitudinal studies on children at increased risk for mental health problems, particularly children raised in environments marked by poverty, family instability, and parental mental illness. He introduced the term "stress-resistant children" to describe those who, despite growing up in these high-risk environments, showed positive psychological (and cognitive) development (Garmezy, 1985). He furthermore suggested that risk factors should be understood to be conditions increasing the likelihood of negative mental health outcomes, and protective factors elements that buffer against adversity. He grouped the latter into three categories: 1) individual factors (e.g., intelligence, problem-solving skills, self-regulation, positive temperament), 2) family factors (e.g., a stable and supportive caregiver, strong sibling relationships, positive parenting practices; family cohesion), and 3) environmental factors (e.g., supportive teachers, strong peer relationships, access to community resources) (Garmezy, 1985). Garmezy viewed resilience as the ability to adapt successfully despite adverse environments and conceptualised it as a relatively stable trait. Garmezy's risk-protection model further influenced studies by e.g. Rutter (1979), and Masten (Masten, 2001; Masten & Powell, 2003).

Rutter, influenced by Bowlby's work on the child-caregiver relationship, expanded upon Garmezy's research by integrating elements of attachment theory (Rutter, 1995). For Rutter, resilience was not a trait, but a developmental process that fluctuates over time and that is shaped by complex interactions between changes in both individual and environmental factors. He highlighted the dynamic interactions of these factors in determining mental health outcomes in children (Rutter, 1987).

Masten (2001) reframed resilience built in Rutter's conceptualisation of resilience as a process, but highlighted that it is the result of processes that are available to most children. Her research demonstrated that children exposed to adverse environments – such as poverty and family stress – were at increased risk for negative mental health outcomes but could thrive when

supported by common protective systems, such as stable caregiving environments and strong social networks. She emphasised the importance of everyday protective factors including secure attachment and supportive relationships in fostering resilience (Masten, 2001), and highlighted, among other factors, the quality of the parent-child attachment relationship (Masten & Coatsworth, 1998). She therefore also conceived resilience not to be an inherent trait but the result of interactions between individual strengths and external protective systems (Masten, 2001).

Resilience can currently be defined as a “dynamic process, consisting of a series of ongoing, reciprocal transactions between the child and the environment (Vanderbilt-Adriance & Shaw, 2008, p. 3). At the time this thesis was conceived, resilience research strongly suggested that resource factors protect children and adolescents from the negative effects of adverse environments. Over the past decades, resilience research has yielded extensive insights into risk and protective factors of child and adolescent mental health and their interactions, offering implications for clinical practice, policy development, and intervention strategies aimed at supporting at-risk groups of children and adolescents (Luthar & Cicchetti, 2000).

This chapter discussed how epidemiological research on adverse environments evolved from focusing on the pathology of risk factors – such as poverty, family disruption and separation – to identifying protective factors that are commonly available to children and adolescents and that enable positive development, such as stable caregiving homes, secure and supporting relationships, and strong social support systems. This shift in understanding resilience processes, including the associated risk and protective factors, significantly advanced the knowledge of how young people can overcome unfavourable conditions.

2.3. Epidemiological Approach to Child and Adolescent Mental Health

The following chapters describe the avenue of the influence of global organisations and international approach to child and adolescent mental health and its determinants (Chapter 2.3.1). Epidemiological and populations-based studies are briefly discussed in the next chapter (Chapter 2.3.2).

2.3.1. The Emergence of a Global Approach on Child and Adolescent Mental Health

The aftermath of World War II also marked the avenue of another great shift on an international level that would influence the field of paediatric mental health and its research on determinants: International organisations were created to improve health care and health services. The WHO was established in 1948 as an agency of the United Nations (WHO, 1948; Brown, Cueto, & Fee, 2006). It’s purpose was to e.g., to coordinate international health responses and health

programs such as vaccination programmes, and defining global standards for health data, classification, and treatment (Gostin & Katz, 2016; United Nations, n.d.; WHO, n.d.-c).

In 1948, in the preamble to its Constitution, the WHO redefined health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 1948, preamble). This represented an almost "revolutionary" shift (Larsen, 2021, p.112) from the biomedical explanation of health that had previously dominated (Larsen, 2021). The new definition emphasised the interconnectedness of physical, psychological, and social dimensions of health, and highlighted that well-being includes more than just the absence of illness (Langevin, 2024, Larsen 2021). By explicitly including mental and social well-being, the WHO's definition emphasised these dimensions and therefore provided the foundation for a modern approach to health promotion and quality of life (Larsen, 2021). Moreover, concepts of health have since then evolved to encompass subjective dimensions of physical and psychological well-being (Ravens-Sieberer et al., 2005). In paediatric health research, this gave rise to the construct of Health-Related Quality of Life (HRQoL), which captures a person's self-perceived physical, emotional, and social functioning within their developmental and social context (Ravens-Sieberer et al., 2005; The KIDSCREEN Group Europe, 2006)[2].

Regarding child and adolescent mental health, the WHO in its early years was informed, amongst others, by the work of Bowlby on child attachment (Bowlby, 1951; Kahr, 2019). Over time, child and adolescent mental health became embedded in international frameworks, such as the *Convention on the Rights of the Child* (United Nations, 1989) and the United Nations *Sustainable Development Goals for 2030* (United Nations, 2015). With regards to health determinants, the WHO introduced the concept of *Social Determinants of Health* in the *Ottawa Charter for Health Promotion* in 1986 thereby highlighting that (mental) health outcomes could not be fully explained by biological or individual factors alone. These social determinants shaping physical and mental health included the socioeconomic status, education, social support networks, and the physical environment (WHO, 1986). Three decades later, the *Social Determinants of Mental Health Report* (WHO, 2014) drew international attention to the influence of social, economic, and physical environments on mental health. The report also emphasised how adverse conditions experienced during childhood and adolescence contribute to poor mental health outcomes. The determinants identified included the quality of parenting and parent-child relationship, such as insecure attachment, neglect, and family conflict, along with parental mental illness (WHO, 2014).

The WHO literature and the literature from other international bodies all have shared the acknowledgment of the need for collective efforts to address child and adolescent mental health and well-being, and their underlying determinants. They furthermore all include a "call

[2] See Chapters 2.4.2 and 2.4.4 of this thesis for a more detailed definition of HRQoL and its operationalisations.

to action" (see also Joshi et al., 2014, p.1) with cross-disciplinary research examining the complex interplay of the various factors shaping child and adolescent mental health and informing political stakeholders and national health bodies to implement targeted interventions and preventive strategies (Joshi et al., 2014; WHO, 1986; WHO 2008).

2.3.2. The Need for Epidemiological Studies

The preceding chapter described how, in the decades following World War II, there was growing international recognition of the need to better understand child and adolescent mental health, including the associated risk and protective factors and their interplay. This increased awareness prompted international, regional, and national health bodies, organisations, and research groups to initiate large-scale, epidemiological, and longitudinal studies focusing on youth mental health (Verhulst & Tiemeier, 2015).

Epidemiological and longitudinal studies provide comprehensive data on the prevalence, persistence, and comorbidities of mental health problems in young populations. Such studies furthermore allow researchers to assess determinants of mental health such as age, sex, socioeconomic status, and the social and cultural context (Costello et al., 2003; Verhulst & Tiemeier, 2015). Furthermore, longitudinal designs offer data on the development and persistence of mental health problems from childhood into adulthood, enabling the examination of long-term outcomes and the influence of early life factors (Fryers & Brugha, 2013; Verhulst & Tiemeier, 2015). Epidemiological studies have therefore become essential for understanding mental health issues in children and adolescents and for informing public health interventions aimed at reducing risk factors and promoting positive developmental pathways of mental health outcomes (Costello et al., 2003, Verhulst & Tiemeier, 2015). Between the 1950s and 2000s, several landmark studies were initiated; some of the most important are listed below, though the list is not exhaustive[3]:

- The National Health Interview Survey – NHIS in the United States began collecting information on mental health, including child mental health, in 1957. Over the years, it has been able to provide early insights into the mental health challenges faced by children, especially in terms of depression, anxiety disorders, and externalising problems. It has been an important source for understanding child mental health trends over time (Centers for Disease Control and Prevention, n.d.).
- The British National Cohort Study (now National Child Development Study – NCDS) followed more than 17'000 children born during a specific week in March 1958. Its main aim was to focus on health, social, and economic outcomes from birth through adulthood. Over time, it collected data on physical and mental health, education, employment, and

[3] For a more comprehensive overview on population-based studies in child and adolescent mental health problems see Verhulst and Tiemeier (2015).

family and social factors. It continues to provide valuable insights into how early life influence long-term health and well-being (Power & Elliott, 2006).

- The above-mentioned Isle of Wight Study in the United Kingdom was an epidemiological study that began its data collection in the 1960s, following a cohort of children and adolescents living on the Isle of Wight. It assessed their mental health and several risk factors to mental health, such as social disadvantage, family conflict, and parenting difficulties (Rutter, Tizard, & Whitmore, 1970).
- The Dunedin Study (New Zealand) began to follow a cohort of children in the 1970s from birth into adulthood. It collected data on various mental health outcomes, including psychiatric disorders, tracked mental health trajectories, and identified early predictors of psychiatric disorders. It was one of the first studies to investigate the long-term impact of childhood mental health issues on adult outcomes (Silva, 1990; Poulton et al., 2015).
- The Behaviour and Wellbeing of Children and Adolescents in Germany study (BELLA) (Germany) focuses on mental health outcomes and their trajectories, and risk and protective factors in children and adolescents, as well as on mental health care use (Ravens-Sieberer et al., 2007). Details about the BELLA study are presented in Chapter 2.5.2 and in Chapter 4.1.
- The UK Millennium Cohort Study is a large-scale longitudinal study that tracks the physical and mental health of 19'000 children born around the year 2000. It furthermore examines how socioeconomic factors and early life experiences influence psychological well-being (Joshi & Fitzsimons, 2016).

Additionally, global studies, such as the World Mental Health Survey Initiative (Kessler et al., 2009) and the Global Burden of Disease Study (Institute for Health Metrics and Evaluation, n.d.) provide extensive data that enhance the understanding of child and adolescent mental health on a global level. Their strengths also lie in focussing on the societal costs and the overall burden of disease negative (child and adolescent) mental health can have by calculating the burden of disease by means of Disability-Adjusted Life Years (DALYs)[4] (Kessler et al., 2009).

The first section of this chapter outlined how, since the mid-20th century, global efforts – led by organisations such as the WHO – increasingly recognised the importance of child and adolescent mental health, emphasising social determinants such as poverty, and the quality of parenting and the parent-child relationship. The WHO's definition of health expanded the concept to include mental and social dimensions of well-being, moving beyond a purely biomedical model and paving the way for a broader understanding of positive health,

[4] DALYs are a measure developed by the WHO to quantify the overall burden of disease. They represent the total number of years lost due to ill-health, disability, or early death (WHO, n.d.-b.).

including the concept of HRQoL. In response to international conventions and public health frameworks that called for coordinated political and scientific action, large-scale epidemiological and longitudinal studies were developed.

2.4. Definitions and Measures of Child and Adolescent Mental Health Problems and HRQoL

This chapter provides a brief overview of the definitions of child and adolescent mental health problems (Chapter 2.4.1) and HRQoL (Chapter 2.4.2), followed by a short summary of the measurement tools commonly used to assess these constructs (Chapter 2.4.3 and Chapter 2.4.4 respectively).

2.4.1. Defining Child and Adolescent Mental Health Problems

Child and adolescent mental health problems currently refer to emotional or behavioural difficulties that are outside the normal range for age and development, persist over time, and significantly impair functioning at home, in school, or with peers (Bitsko et al., 2022). These problems include a wide range of conditions, including e.g., anxiety, depression, conduct disorders, attention-deficit/hyperactivity disorder (ADHD), as well as neurodevelopmental disorders (Kieling et al., 2011). They are typically defined according to standardised diagnostic criteria such as those outlined in the *Diagnostic and Statistical Manual of Mental Disorders*, currently in its 5th edition – *DSM-5* (American Psychiatric Association, 2013) and the *International Classification of Diseases*, currently in its 11th revision – *ICD-11* (WHO, 2019).

Research suggests that mental health problems in adults are organised along two correlated latent dimensions – internalising and externalising (Carragher et al., 2005). The same has been shown for mental health problems in children and adolescents (e.g., Goodmann, 1997; Cosgrove et al., 2011). According to the internalising – externalising model, internalising mental health problems in children and adolescents include inward-directed problems such as depression, anxiety, or social withdrawal. In contrast, externalising problems are characterised by outward-directed behaviours and include conduct and behavioural issues (e.g. aggression, rule-breaking), and ADHD (Carragher et al., 2005). The internalising – externalising model has shown to be consistent across cultures and ethnicity, genders, age, and over different time periods (Carragher et al., 2005).

2.4.2. Defining Child and Adolescent HRQoL

HRQoL has been defined as an individual's subjective perception of their physical, emotional, and social well-being within their everyday context and captures the individual’s satisfaction or happiness in these various life domains (Bullinger, 2002; Ravens-Sieberer et al., 2005, Michel et al., 2009). For young people, the dimensions of HRQoL differ somewhat from those

commonly used for adults, typically focusing on areas such as family life, peer relationships, and the school environment (Ravens-Sieberer et al., 2006). HRQoL has been increasingly recognised as a vital health outcome and is used to help to develop effective prevention programmes for children and adolescents (Koot & Wallander, 2001).

2.4.3. Measuring Child and Adolescent Mental Health Problems

Measuring child and adolescent mental health is an important aspect of understanding its prevalence, risk and protective factors, and outcomes (Warnick et al., 2008; Unicef, 2024). Epidemiological studies on child and adolescent mental health commonly rely on standardised assessment tools, including structured or semi-structured interviews (e.g., the Child and Adolescent Psychiatric Assessment – CAPA, Angold et al., 1995; or the Mini International Neuropsychiatric Interview for Children and Adolescents – MINI-KID, Sheehan et al., 2010) and screening instruments. Among the most widely used screening tools in large-scale surveys are the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997 and the Child Behaviour Checklist (CBCL; Achenbach & Rescorla, 2001; (Warnick et al., 2008). The SDQ is a screening instrument that measures emotional (internalising) and behavioural (externalising) mental health problems by means of four problems scales. The scores of all items can be summed up to a *Total Difficulties* score which can subsequently be categorised into *normal*, *borderline* and *abnormal* scores (Goodman, 1997; Meltzer et al., 2000). The CBCL captures a broad range of symptoms across internalising problems (e.g., anxiety, depression, somatic complaints) and externalising problems (e.g., aggression, rule-breaking behaviour) by means of eight syndrome scales, and also comprises DSM-oriented scales aligned with ICD categories Achenbach & Rescorla, 2001. For an overview on measures of child and adolescent mental health see for instance the systematic literature review by Hunter et al. (1996), or the review by Deighton et al. (2014).

In research on child and adolescent mental health, it is standard practice to collect data from multiple informants, particularly from parents and the children themselves. Each informant provides distinct and complementary perspectives that, when combined, increase the accuracy of mental health assessments (Achenbach, 2006; De Los Reyes & Kazdin, 2005). Parent-reports are commonly used due to parents' role as primary caregivers and observers of their child's behaviour across various settings, such as the home, school, and social environments (Ringoot et al., 2015). However, the validity of parent reports may be constrained by limited insight into the child's internal emotional states, particularly if the child does not express distress openly. Additionally, parental mental health status may introduce systematic bias, potentially resulting in over- or underreporting of symptoms (Ringoot et al., 2015; Youngstrom et al., 2000). Self-report measures from children and adolescents offer direct insight into internal experiences, such as sadness, anxiety, or peer-related difficulties, which may not be observable by others (De Los Reyes & Kazdin, 2005). Nevertheless, the accuracy of self-

reports may be limited by developmental constraints, child communication challenges, and social desirability bias, particularly in younger children or those hesitating to talk about emotional difficulties (Achenbach et al., 1987). Given the limitations of a single informant approach, a multi-informant approach is widely recommended (Achenbach, 2006). Combining data from parents, children, and other informants (e.g., teachers) can improve diagnostic accuracy and provides a more complete picture of the child's mental health status (Achenbach, 2006).

2.4.4. Measuring Child and Adolescent HRQoL

HRQoL is typically assessed using standardised, multidimensional instruments that assess physical, psychological, and social aspects of health as perceived by individuals. For children and adolescents, age-appropriate tools have been developed, such as the KIDSCREEN questionnaires (The KIDSCREEN Group Europe, 2006) or the Paediatric Quality of Life Inventory (PedsQL, Varni et al., 2001). In the German context, two widely used and validated instruments for assessing HRQoL in children and adolescents are the KINDL questionnaires (Ravens-Sieberer & Bullinger, 1998) and the KIDSCREEN questionnaires (The KIDSCREEN Group Europe, 2006), the latter including a 52-item, a 27-item and a 10-item version. The KIDSCREEN Group Europe subsequently developed a computerised adaptive test (CAT) version of the KIDSCREEN, known as KIDS-CAT (Devine et al., 2015). This adaptive approach aims to increase the efficiency and precision of HRQoL assessments by tailoring the questionnaire in real-time based on the respondent's previous answers. The instruments often include self-report and proxy-report versions to accommodate different developmental stages and respondent capabilities. Validated measures of HRQoL have become increasingly important in clinical research, population health studies, and health policy evaluation, as they provide a person-centred perspective that adds important insight to traditional health measures (Bullinger et al., 2002; Ravens-Sieberer et al., 2005; Varni et al., 2001).

This chapter briefly discussed the definitions of child and adolescent mental health problems – including the internalising and externalising model – as well as HRQoL. These concepts are two of the major constructs examined in the publications compiled in this thesis. Furthermore, standard measurement tools commonly used in large population-based research on child and adolescent mental health problems and HRQoL were presented.

2.5. Modern Research on Child and Adolescent Mental Health in Germany

The fifth section of this literature review shifts its focus to Germany. It begins with a chapter on German epidemiological and population-based studies (2.5.1) and subsequently presents the BELLA study, its objectives, and its contributions to the field (2.5.2).

2.5.1. Epidemiological and Population-Based Studies in Germany

In Germany, largescale population-based studies on child and adolescent mental health emerged after the second world war (Barkmann & Schulte-Markwort, 2004). Most of the study populations were drawn from urban areas or were regional samples, their design was mostly cross-sectional (Barkmann & Schulte-Markwort, 2004). It was not until the 1980s that large interdisciplinary research projects began to emerge (Barkmann & Schulte-Markwort, 2004) and that the long-term course of child and adolescent mental health problems moved to the forefront of academic and clinical discussions (Schmidt, 2004). Important contributions to the field include the work of Remschmidt and Walter (1990), who introduced the CBCL to the German-speaking context. Esser et al. (1992) conducted Germany's first prospective longitudinal study investigating the prevalence and incidence of mental disorders in this population (Barkmann & Schulte-Markwort, 2004). Döpfner et al. (1997) carried out the first nationally representative study on child and adolescent mental health in Germany (Barkmann & Schulte-Markwort, 2004). For a detailed overview on postwar German population-based studies on child and adolescent mental health, their design, sample sizes, and rates of mental health prevalences, see the systematic literature review by Barkmann and Schulte-Markwort (2004) and other publications (Barkmann & Schulte-Markwort, 2010; Holz et al., 2021).

Within the field of resilience research and research on risk and protective factors of child and adolescent mental health in Germany, two studies are briefly summarised: The Bremer Adolescence Study (Bremer Jugendstudie - BJS) focussed on adolescents' mental disorders and associated risk and protective factors using data of N = 1035 adolescents aged between 12 and 17 years enrolled in the study between 1996 and 1997. Regarding risk and protective factors of mental health, the study measured personal factors such as perceived self-control, self-awareness, and familial and social factors such as the quality of parent and peer relationships, family interactions, and stressful life events (Essau et al., 1998). The ongoing prospective Mannheim Study of Children at Risk – MARS (Mannheimer Risikokinderstudie) constitutes a significant contribution to the understanding of developmental outcomes in children exposed to early-life risk factors in Germany. Its primary aim is to investigate the psychological development of children exposed to various early-life risk factors. Starting in the 1980s, it followed N = 384 children at risk from birth into adulthood, assessing biological (e.g., prenatal and perinatal complications), and psychosocial, respectively parental, familial, and social factors (e.g., economic situation, overcrowded living conditions, single-parent-families, quality of parental relationship, parental mental and physical health, parental coping strategies, social integration and support) (Esser & Schmidt, 2017; Laucht et al., 2000a).

These earlier studies, however, did not combine a representative, population-based and longitudinal design with a comprehensive assessment of both mental health outcomes and associated risk and protective factors – essential elements for generating valid and robust data

on child and adolescent mental health and its determinants. It was not until the early 2000s that such an approach was realised with the emergence of a comprehensive, nationally representative, population-based, longitudinal study on child and adolescent mental health in Germany (Ravens-Sieberer, 2008) (see following subchapter).

2.5.2. The BELLA Study

The BELLA study (**Be**haviour and We**ll**being of Chi**l**dren and **A**dolescents in Germany – in German **Be**fragung zum see**l**ischen Woh**l**befinden und Verh**a**lten – constitutes the first representative, population-based, and epidemiological study in Germany designed to follow children and adolescents longitudinally throughout their development. It serves as the mental health module of the German National Health Interview and Examination Survey for Children and Adolescents (KiGGS). The study systematically assesses a wide range of mental health outcomes alongside multiple risk and protective factors relevant to child and adolescent mental health and HRQoL (Ravens-Sieberer, 2008; Ravens-Sieberer et al., 2007; Ravens-Sieberer, 2008; Ravens-Sieberer et al., 2008a).

The BELLA study's primary aims are to 1) assess the prevalence of mental health problems of children and adolescent, e.g. the frequency of internalising (e.g., anxiety, depression) and externalising (e.g., conduct disorders, ADHD) mental health problems, 2) evaluate children and adolescents' HRQoL, and 3) identify risk and protective factors of mental health problems and HRQoL by examining how personal, familial, and social factors contribute to these mental health outcomes. Furthermore, by following up on the BELLA study cohort, the BELLA study furthermore aims at 4) tracking mental health development over time to understand how mental health evolves from childhood to adolescence and early adulthood. Finally, the BELLA study aims to 5) inform public health policies, and prevention and intervention programmes by providing evidence-based insights to improve mental health care services and prevention strategies for children and adolescents in Germany (Hintzpeter et al., 2015; Ravens-Sieberer et al., 2007; Ravens-Sieberer, 2008; Ravens-Sieberer et al., 2008a). Details about the sampling, samples, and the different measurement points are summarised in chapter 4.1; further details can be found in, e.g., Ravens-Sieberer et al.(2008a) and Ravens-Sieberer et al. (2015).

The publications with findings from the BELLA study have addressed in the past – that is, prior to the conceptualisation of this present thesis – prevalences of various child and adolescent mental health problems (e.g., Ravens-Sieberer et al; 2007; Bettge et al., 2008; Herpertz-Dahlmann et al., 2008; Ravens-Sieberer et al., 2008b) and HRQoL (e.g., Ravens-Sieberer et al., 2008c; Barkmann et al., 2016), and analysed the prevalence and interplay of risk and protective factors associated with child and adolescent mental health problems (e.g., Ravens-Sieberer et al; 2007; Wille et al., 2008; Klasen et al., 2015), as well as estimated general state

transitions of child and adolescent mental health problems (Ravens-Sieberer et al., 2015). Furthermore, publications examined mental health care use of children and adolescents (Hintzpeter et al., 2015; Ravens-Sieberer et al., 2015) and addressed specific aspects of epidemiological research such as analysing psychometric properties of measurement tools (Barkmann et al., 2008; Bullinger et al., 2008). With its many publications based on its multiple data waves, the BELLA study not only contributes to the international research community but also provides relevant data to German federal health authorities, policy makers, and other stakeholders (Ravens-Sieberer et al., 2007; Ravens-Sieberer et al., 2008a, Ravens-Sieberer at al., 2008b).

The fifth section of this literature review focused on the German landscape of child and adolescent mental health: At first, population-based studies on child and adolescent mental health relied on regional, cross-sectional designs. Significant progress began in the 1980s with longitudinal and interdisciplinary studies. Resilience-focused studies such as the BJS and the MARS deepened the understanding of risk and protective factors. However, these earlier efforts lacked a representative, longitudinal, and comprehensive design. This gap was addressed by the BELLA study, Germany's first population-based, nationally representative, longitudinal mental health study of children and adolescents. BELLA investigates the prevalence of mental health and HRQoL and associated risk and protective factors. It also aims to track developmental trajectories over time and supports public health planning through evidence-based findings. Numerous publications from the BELLA study have informed both national and international research and policy development.

2.6. Trajectories, Determinants, and Vulnerable Groups in Child and Adolescent Mental Health and Well-Being

Chapter 2.6 of this thesis examines the central thematic areas addressed in the publications included in this cumulative dissertation. The first subsection provides a brief overview of the literature on the prevalence and frequency of mental health problems, as well as their development over time, in children and adolescents in Germany (Chapter 2.6.1). The following subchapter summarises the literature on risk and protective factors related to child and adolescent mental health in Germany (Chapter 2.6.2). The third subsection examines one of the at-risk groups identified in resilience research on risk and protective factors: families with parents experiencing mental health issues (Chapter 2.6.3). Subchapter 2.6.4 addresses the vulnerable group of adolescents with externalising mental health problems. Finally, Chapter 2.6.5 outlines the research on child and adolescent HRQoL. Research gaps are identified and highlighted to inform the research questions of this thesis that will be presented in Chapter 3.

2.6.1. Prevalences and Longitudinal Assessments of Child and Adolescent Mental Health[5]

Prevalence rates of child and adolescent mental health problems in Germany prior to the COVID-19 pandemic vary depending on the mental health outcomes assessed and the measures used[6]. On average, about one fifth to one sixth of the children and adolescents are affected (Barkmann & Schulte-Markwort, 2004; Barkmann & Schulte-Markwort, 2010; Hölling et al., 2014, Ravens-Sieberer et al., 2007). In representative German samples, the prevalence rates range from 2% to over 20%, depending on the mental health problems assessed, and the measures, the cut-off values, and the respondent's' perspective used (cf. Hölling et al., 2014; Ravens-Sieberer et al., 2007). For instance, the average prevalence of mental health problems among children and adolescents in Germany as aggregated by the systematic literature review including 29 population-based studies from postwar Germany by Barkmann and Schulte-Markwort (2004) amounts to 17.2%, with a standard deviation of 5.07%. Similarly, a meta-analysis by the same authors analysing 33 community samples in Germany revealed a pooled overall prevalence of 17.6% (Barkmann & Schulte-Markwort, 2010). Hölling et al. (2014) reported about 20% of possible and probable mental health (as measured by the SDQ *abnormal* and *borderline* scores[7]). The frequencies of mental health problems as calculated by the SDQ *abnormal* and *borderline* scores at the BELLA study baseline assessment ranged between 9.5% and 20.4%, with younger children showing higher rates compared to older children and boys showing high rates than girls. Girls furthermore tended to score higher on measures assessing internalising problems, whereas boys scored higher on measures assessing externalising problems (Ravens-Sieberer et al., 2008b). These results compare similarly to international prevalences (Belfer, 2008; Kieling, et al., 2011).

Regarding longitudinal analyses of mental health problems based on representative population-based data, the body of research in Germany at the time of the conception of this thesis was scarce. Ravens-Sieberer et al. (2008a) calculated state transitions of mental health problems using data of the first four measurement points of the BELLA study. About half of the children and adolescents who reported any one of the assessed internalising and externalising mental health problems at the baseline assessment showed mental health problems one and two years later; six years later almost a third of the baseline cases reported mental health problems (Ravens-Sieberer et al, 2008a). At the international level, Costello et al. (2003) and Costello et al. (2011) analysed the prevalence rates of various psychiatric disorders across of

[5] This chapter presents a brief overview of the prevalences of child and adolescent mental health problems in Germany during the period in which the publications of this thesis were developed, prior to the onset of the COVID-19 pandemic and its subsequent adverse impact on child and adolescent mental health. For details regarding the impact of the Covid-19 pandemic on child and adolescent mental health in Germany; see the publications related to the *COVID-19 and PSYchological Health – COPSY* study (e.g., Ravens-Sieberer et al., 2023).

[6] Studies employing questionnaires tend to report lower prevalence rates compared to those using diagnostic interviews (Barkmann & Schulte-Markwort, 2004).

[7] See chapter 2.4.3 and the Methods chapter of this thesis for more details about the SDQ scores.

childhood, adolescence, and young adulthood. Costello et al. (2003) described a decrease of mental health disorders from the age of 9 until the onset of adolescence at 12 years of age, followed by a slight increase after the age of 12. Boys in general seemed to have higher prevalences than girls. These findings demonstrate that gender and age-specific analyses are imperative to better understand trajectories of mental health problems to adapt prevention and intervention strategies accordingly. Publication 1 of this thesis provides a summary of the more recent findings on trajectories of child and adolescent mental health problems by Costello et al. (2011).

2.6.2. Risk and Protective Factors for Child and Adolescent Mental Health

Risk factors can be defined as characteristics or conditions that, if present, increase the risk for mental health problems. Protective factors can be defined as characteristics or conditions that, if present, diminish the risk of developing mental health problems (U.S. Department of Health and Human Services, 2001). Research on risk and protective factors of child and adolescent mental health is closely intertwined with resilience theory and research (Luthar et al., 2000; Pellegrini, 1990; Rutter, 2006)[8]. Furthermore, in the field of risk research, the hypothesis of cumulative risk to child and adolescent mental health and development has received growing attention. It suggests that the risk of mental health increases with the number of co-occurring risk factors (Appleyard et al., 2005; Oliver et al., 2014).

At the time this thesis was developed, research on risk and protective factors of child and adolescent mental health based on population-based studies in Germany was limited. Key contributions originated from the MARS (see also Chapter 2.5.1), as well as from the data the BELLA study had published up to that point. The MARS demonstrated that children growing up in environments with high exposure to psychosocial risks showed higher rates of mental health problems than children from low-risk environments. The results furthermore demonstrated an additive effect of risk factors, with children exposed to both organic and psychosocial adversities facing the most significant challenges. The study's findings also identified protective factors that contribute to positive developmental outcomes despite early-life adversities, such as supportive parent-child relationships and the development of cognitive and social-emotional competencies Laucht, Esser, & Schmidt, 2000b).

The BELLA study measures a variety of determinants of mental health outcomes (Wille et al., 2008). Risk factors include biological, socioeconomic, and psychosocial factors such as low socioeconomic status, stressful life events, parental daily strain, difficult family constellations, parental chronic illness, and parental mental health problems. With respect to protective

[8] For a more detailed and comprehensive discussion on risk and protective factors, their interplay, and their interconnectedness with resilience theory and research, see Pellegrini (1990) and Scheithauer and Petermann (1999). For a detailed discussion about the different interactions possible between risk and protective factors (e.g., direct, interactive, moderating), see Luthar et al. (2000).

factors included in the BELLA study, personal (e.g., self-efficacy, self-concept, optimism), familial (e.g., family climate, parental support) and social resources (social support, peer competence, school climate) are assessed. Results published based on the BELLA study's data firstly revealed that several risk factors predicted children and adolescents' mental health problems, including family conflicts, parental strain, and parental mental health problems, with growing up with a stepparent being the strongest predictor of mental health problems in children and adolescents (Wille et al., 2008). Secondly, the distribution of risk factors was comparable between boys and girls. However, a greater accumulation of risk factors was observed during adolescence, suggesting that the lifetime exposure to certain adverse conditions and other risk factors tends to increase with age. Similar age-related patterns were observed in relation to the availability of protective factors, with adolescents reporting fewer resources compared to younger children (Wille et al., 2008). Furthermore, the findings from the BELLA study confirmed the results from MARS with regards to the cumulative risk hypothesis: In families with six or more risks factors present, nearly two-thirds of the children and adolescents exhibited mental health problems, compared to 16 % and 24 % among those families with a low risk profile (with one or two risk factors present, respectively) (Wille et al., 2008). With regards to protective factors the evidence from the BELLA data indicates that a greater availability of resources (e.g., positive family climate, strong social support, and favourable personality traits) was associated with a lower prevalence of mental health problems and, especially in families with a low risk profile (one or two risks presents), protective factors buffered against risk factors (Wille et al., 2008).

2.6.3. Children and Adolescents of Parents with Mental Health Problems

The body of literature regarding children and adolescents of families with parental mental health problems available at the time this thesis was developed has reliably and consistently showed a negative effect of parental mental health on the child's mental health (see e.g., Hosman et al., 2009; Wiegand-Grefe & Petermann, 2016)[9]. Furthermore, as discussed in the previous chapter (Chapter 2.6.2), co-occuring risk factors increase the risk for mental health problems. This is particularly true for families with parental mental health problems, as the body of literature suggests that multiple interconnected factors contribute to an increased risk of mental health problems in children of parents with mental illness (Hosman et al., 2009; Reupert & Maybery, 2016; Wiegand-Grefe & Petermann, 2016). These risk factors include genetic factors, such as genetic vulnerability (Caspi et al. 2010; Hosman et al., 2009), heritability of impulsivity, and difficulties with emotion regulation (Hosman et al., 2009). Additionally, risk factors related to the parental mental illness itself, such as insensitive responsiveness, impaired parenting, neglect, chronic family stress, conflict, violence, and

[9] See also Publication 2 for an overview on the increased risk of psychological and developmental difficulties of children of parents with mental health problems.

parentification, also play a significant role (Hosman et al., 2009). Common contextual risk factors, including poverty, domestic violence, housing conditions further increase the risk (Hosman et al., 2009; Wiegand-Grefe & Petermann, 2016; also see Chapters 2.1, 2.2, and 2.3.1 of this thesis). These findings (e.g., risk factors insensitive responsiveness or lack of attunement, impaired parenting, neglect, parentification) also highlight the central role of the caregiver-child relationship in promoting positive psychological development (Wiegand-Grefe & Petermann, 2016) and is consistent with theoretical frameworks such as attachment theory (see Chapter 2.1.3), that emphasise the protective influence of secure caregiver-child bonds on child and adolescent mental health.

Protective factors that may mitigate the impact of parental mental health problems on children and adolescents encompass personal, familial, and social factors (Wiegand-Grefe & Petermann, 2016). A key protective factor is the presence of close, supportive relationships not only within the family but also with personally significant adults outside the family (Wiegand-Grefe & Petermann, 2016, Petris & Dimova, 2016). Furthermore, positive family functioning has shown to buffer against the negative effects of parental mental health problems (Wiegand-Grefe et al., 2016). Additionally, a strong social network, such as close friends, supportive teachers, and positive school environments may contribute to a positive development of mental health in this vulnerable group of children and adolescents (Hosman et al., 2009; Pretis & Dimova, 2016; Wiegand-Grefe & Petermann, 2016).

To date, representative and population-based data regarding the situation of the at-risk group of children and adolescents of parents with mental health problems have only rarely been examined (see, e.g., Kessler et al., 2012; McLaughlin et al., 2012), even less so in Germany, where a lack of representative data is observed. In Germany, there is a lack of reliable information on the number of families affected by parental mental health problems, the specific risk constellations these families face, and the prevalence of mental health issues among children and adolescents within these families, making this group a particularly vulnerable population. Furthermore, it is of utmost importance to investigate and identify factors that may mitigate the impact of parental mental health problems so that they could be targeted in prevention and intervention programmes (Wiegand-Grefe & Petermann, 2016).

2.6.4. Children and Adolescents with Externalising Mental Health Problems

As Chapters 2.6.2 and 2.6.3 established, in high-stress and high-risk environments, such as in families with parental mental health problems, children and adolescents are at an increased risk of developing mental health problems themselves. Children and adolescents may externalise their distress through aggression, defiance, or risk-taking as a maladaptive coping mechanism (Beardslee et al., 1998). Externalising mental health behaviour however negatively affect the development of children and adolescents and can affect the personal, familial, or

social experience and life of the child or adolescent, resulting in further impairments across different areas of life (Currie & Stabile, 2006). Furthermore, externalising mental health problems in childhood and adolescence have been shown to follow long-term developmental trajectories throughout the entire lifespan, leading to e.g., academic failure, substance use, criminal behaviour, interpersonal conflict, and lower socioeconomic status (Fergusson et al., 2005; Joshi et al., 2014; Moffitt, 1993; Moffitt et al., 2001).[10] Beauchaine and McNulty (2013) proposed a developmental model, where externalising behaviour is shaped by dynamic interactions between individual traits (e.g., genetic factors) and environmental factors (e.g., coercive parenting, negative influence of peers, neighbourhood criminality). In addition, externalising problems that persist into adulthood are significantly associated with higher rates of adult mental health problems and psychiatric disorders including, e.g., depression, anxiety, substance use disorders, conduct disorders, and antisocial personality disorder (De Genna et al., 2006; Odgers et al., 2007; Serbin & Karp, 2004), which subsequently increase the risk of similar difficulties in the following generation (Serbin & Karp, 2004). Hence, externalising mental health problems not only impose a substantial burden on the individual itself, but also on the families, the social environment, and the healthcare and social systems, entailing high societal and economic costs (Belfer, 2008; Ewest et al., 2013).

At the time this thesis was conceived, data on the long-term consequences of externalising mental health problems in Germany was limited. Existing research primarily focused on prevalence rates among children and adolescents, as well as on risk and protective factors and developmental trajectories during childhood and adolescence (Fernandez Castaleo & Kröner-Herwig, 2014).

2.6.5. HRQoL in Children and Adolescents

Research on HRQoL among children and adolescents in Germany has provided important insights into the well-being of this population. The BELLA study has generated normative data on HRQoL (Ravens-Sieberer et al., 2008c). Findings indicate that children and adolescents with low SES report significantly lower HRQoL. Further analyses revealed that HRQoL tends to decline with age, particularly among girls (Ravens-Sieberer et al., 2008c). Furthermore, European research indicates that children and adolescents with chronic conditions such as diabetes (Murillo et al., 2017), or physical issues or disabilities (Sagheri et al., 2009; Silva et al., 2013) report lower HRQoL compared to their healthy peers. In addition, child and adolescent mental health problems (Ravens-Sieberer et al., 2008d), as well as parental mental health problems (Giannakopoulos et al., 2009), were associated with lower HRQoL. Other risk factors that were found to be associated with low HRQoL include living conditions, deficits of social support, and coping strategies (Bullinger et al., 2008). Protective factors associated with

[10] For an overview of long-term consequences of externalising mental health problems see Publication 4).

positive HRQoL included personal factors such as self-efficacy, familial factors such as positive family climate, as well as social support (Ravens-Sieberer et al., 2008d)[11]. Longitudinal effects of risk factors on HRQoL with population-based data was investigated by Barkmann et al. (2016). The findings suggest that mental health and physical problems of the child or adolescent, parental mental health problems, as well as age, gender, migration background, and socioeconomic status negatively affect HRQoL over time (Barkmann et al., 2016).

However, at the time this thesis was conceived, longitudinal and population-based research investigating both risk and protective factors influencing changes in HRQoL over time was lacking.

The sixth section of this thesis' theoretical background summarised existing research on the prevalence of child and adolescent mental health problems in Germany, along with the available longitudinal findings. The second subchapter reviewed findings on risk and protective factors related to mental health in this population. The third subchapter focused on children and adolescents growing up with parents with mental health problems. The fourth subchapter addressed another high-risk group: children and adolescents with externalising mental health problems, emphasising the potentially adverse developmental trajectories they may face. Finally, the body of research on HRQoL in children and adolescents was summarised in Chapter 2.6.5.

This section also identified key research gaps within the German context that this thesis seeks to address. Based on these gaps, the aims and research questions of this thesis will be outlined in the following chapter.

[11] For a more comprehensive overview on risk and protective factors of HRQoL see Publication 5

3. Aims and Research Questions

Although epidemiological and population-based studies have significantly advanced our understanding of child and adolescent mental health – including its determinants, risk and protective factors, and vulnerable groups at risk for negative developmental trajectories – and despite a substantial body of research in this field in Germany, many questions remain unanswered. My cumulative dissertation aims to contribute to the understanding of mental health development in children and adolescents by addressing several key research gaps within the German context. It brings together a series of publications that examine different aspects of child and adolescent mental health, including trajectories of internalising and externalising mental health problems, the investigation of vulnerable subgroups, including children and adolescents with parents with mental health problems and adolescents with externalising mental health problems, the associated risk and protective factors or long-term outcomes involved, as well as the influence of risk and protective factors on changes of child and adolescent well-being.

Specifically, this thesis firstly includes a publication which, drawing on data from the longitudinal BELLA study cohort, investigates trajectories of internalising and externalising mental health problems in children and adolescents, identifying increasing and decreasing patterns over time and highlighting age and gender specific groups at elevated risk for the respective mental health problems (Publication 1). The second publication focusses on children of parents with mental health problems – an especially vulnerable population. The publication examines the overall risk constellation of these families, provides prevalence rates, and analyses the risk associated for children with parents with mental health problems to develop mental health problems themselves (Publication 2). The third publication examines this population in greater depth by identifying protective factors that support positive mental health, thereby contributing to a better understanding of how positive pathways of mental health can be fostered in children and adolescents growing up in families affected by parental mental health problems (Publication 3). The fourth publication explores the potential negative trajectories of mental health problems, focusing on the long-term impact of externalising mental health problems in individuals aged 12 and older. It demonstrates how these issues can affect outcomes in early adulthood, particularly in relation to risk-taking behaviours and socio-economic difficulties, all of which can have enduring adverse effects on an individual's life (Publication 4). Publication 5 finally explores parental and paediatric mental health problems and selected protective factors and their influence over time on children and adolescents' HRQoL.

Together, this thesis aims to contribute to a more differentiated understanding of how child and adolescent mental health evolve. It furthermore aims at contributing to the understanding of risk and protective factors of child and adolescent mental health and HRQoL, in particular with

regards to vulnerable populations, and stresses the relevance and importance of targeted and group specific prevention and intervention programmes to prevent negative and maladaptive pathways over the course of an individual's life.

Based on these aims this doctoral thesis addresses the following overall research questions:

1. What are the trajectories of internalising and externalising mental health problems in children and adolescents in Germany and can age- and gender-specific patterns in these trajectories be observed?
2. What is the prevalence of the vulnerable group of families with parental mental health problems in Germany and to what other high risks to mental health are these families exposed to? How many children and adolescents living in these high-risk families develop mental health problems themselves?
3. What personal, familial, and social protective factors enable children and adolescents in families with parental mental health problems to maintain good mental health and well-being despite adverse circumstances?
4. What are the negative long-term outcomes of adolescent mental health issues, specifically in those with externalising problems?
5. What are the effects of risk and protective factors on HRQoL in children and adolescents?

The next chapter describes the methods used to investigate these research questions.

4. Method

The following chapters offer an overview of the general BELLA sample (Chapter 4.1), as well as the measures and instruments employed to operationalise the constructs analysed in the publications (Chapter 4.2). Additionally, Chapter 4.3 outlines the analytical strategies applied in the publications included in this thesis to address the research questions presented in Chapter 3. To enhance the readability of this thesis, a concise description of the samples analysed in each publication is provided in Chapter 5, where the corresponding results are presented. For more detailed information on the samples and measures used in each publication, please refer to the original research articles included in Chapter 5.

4.1. BELLA Study Sample

As described in chapter 2.5.2, the BELLA study is a population-based and longitudinal survey that has been collecting extensive data on young people's mental health and its determinants over several time points since 2003. It is conducted by the research unit Child Public Health at the University Medical Centre Hamburg-Eppendorf in cooperation with the German Robert-Koch Institute. Initiated between 2003 and 2006, the BELLA study aims to investigate the mental health and HRQoLof children and adolescents in Germany (Ravens-Sieberer, 2007; Ravens-Sieberer et al., 2008). The BELLA study moreover specifically collects representative epidemiological data on the participants' mental health status, its influencing factors, and the participants' health care utilisation by means of standardised and validated instruments and CATs. The BELLA study's primary aims have been presented in Chapter 2.5.2.

The BELLA study representative baseline sample was recruited from all KiGGS participants at the baseline assessment (2003 to 2006). At the BELLA study baseline, a total of n = 2,863 children and adolescents aged 3 to 17 years, their parents, as well as young adults over 18 years of age participated. This cohort was followed-up in four additional waves conducted from 2004 to 2007, 2005 to 2008, 2009 to 2012, and 2015 to 2017. An overview of the sample sizes of the KiGGS and BELLA baseline and follow-up waves can be found in Figure 1. A detailed description of the sampling method, recruiting method, response rate and non-responder analyses, as well as the weighting procedure applied to adjust for discrepancies with regards to the German population and the distribution regarding age and gender of the BELLA study baseline sample can be found in Ravens-Sieberer et al. (2008a) and Ravens-Sieberer et al., (2015).

The analyses conducted for the publications included in this thesis were based on the available cross-sectional and longitudinal data and respective measurements from the BELLA study from baseline, the 1-year, two-year and 6-year follow-up (see Figure 1). To enhance the readability of this thesis, a brief description of the analysed samples for each publication is provided in Chapter 5.

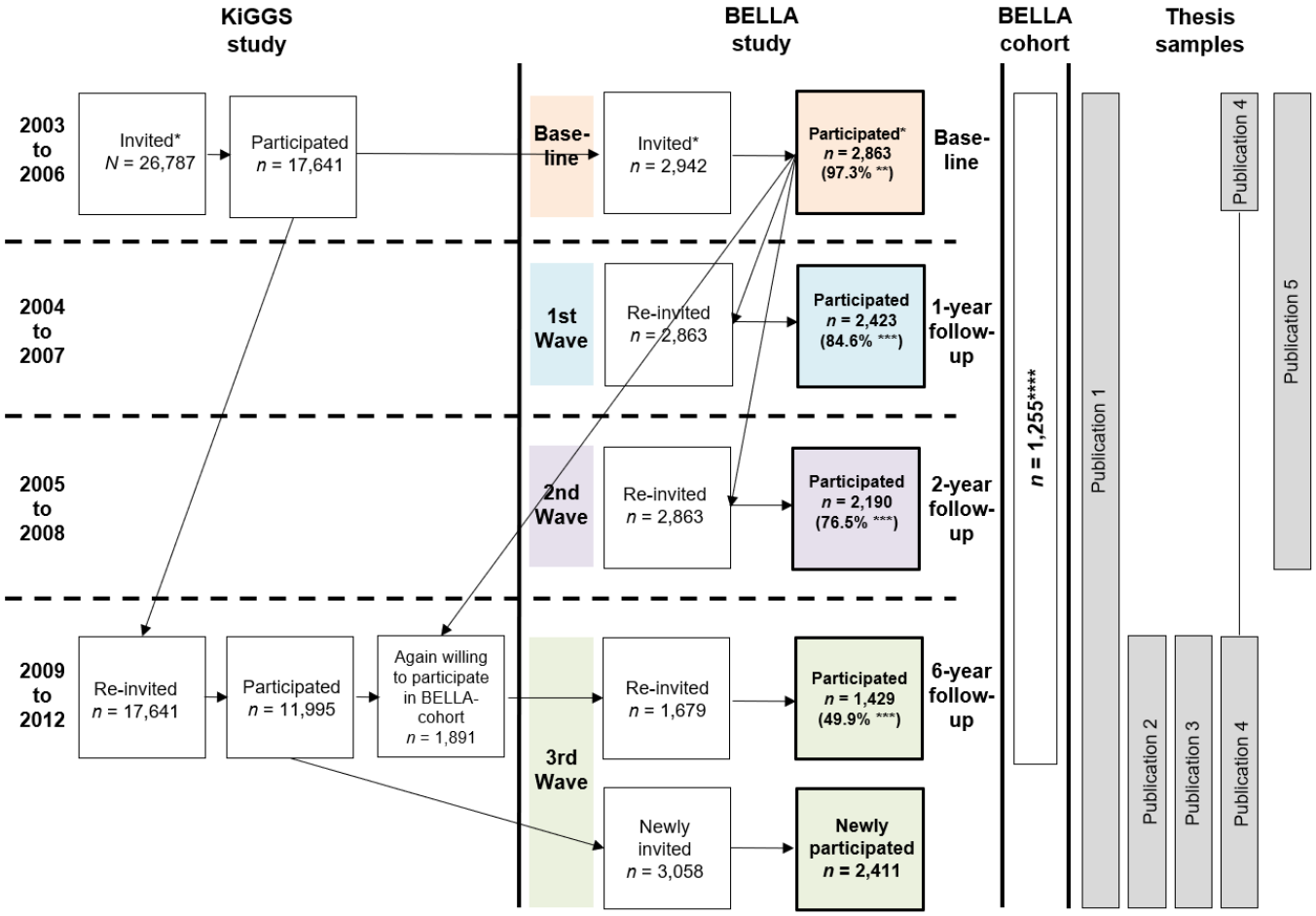


Figure 1

BELLA study assessment waves, sample sizes, and related publications

Note. * = Representative samples; ** of Invited at BELLA baseline; *** of Participated at BELLA baseline; **** Children and adolescents participating in all four measurement points of the BELLA study with no missing data on mental health measures. Adapted with permission from *The longitudinal BELLA study: Design, methods and first results on the course of mental health problems,* by U. Ravens-Sieberer et al., 2015, *European Child & Adolescent Psychiatry*, *24*(6), p. 655. https://doi.org/10.1007/s00787-014-0638-4.

4.2. Measures

The constructs investigated in the BELLA study were measured using standardised measurement instruments and include measures assessing internalising and externalising mental health problems typically arising during childhood and adolescence such as depressive symptoms, symptoms of anxiety, symptoms conduct problems, and symptoms of ADHD. Furthermore, children and adolescents' HRQoL was measured. Moreover, a multitude of child and adolescent mental health determinants were assessed. These include constructs centring around the individual itself, (e.g., prenatal risk factors, chronic illness, self-concept, self-efficacy, optimism, coping strategies), family characteristics (e.g., socioeconomic status, migration, parental unemployment, number of siblings, parental conflict, parental divorce, parental somatic and/or mental illness, family climate, parental support with regard to the child),

and social environment (e.g. social support, peer relationships, school climate, neighbourhood characteristics) (Ravens-Sieberer et al., 2008a).

The operationalisation of the constructs investigated in this thesis, including standardised and validated measurement instruments, is described below[12].

4.2.1. Child and Adolescent Mental Health and HRQoL

Overall child and adolescent mental health problems (Publications 2, 3, 4, and 5) were measured using the child-report of the SDQ Questionnaire (Goodman, 1997; Goodman, Meltzer & Bailey, 1998) German Version (Klasen et al., 2000). The SDQ records emotional and behavioural difficulties and strengths typically arising in childhood and adolescence. The five subscales identify *emotional symptoms*, *hyperactivity/inattention, peer relationship problems, conduct problems,* and *prosocial behaviour* over the past six months by using five items each with a three-point-scale response options *not true*, *somewhat true*, *certainly true*. To generate the *Total Difficulties* score, the items from the four problem scales are summed up, and, based on established cut-off values (Goodman, 1997; Meltzer et al., 2000), subsequently categorised into *normal*, *borderline*, or *abnormal* mental health problems. For the dichotomised variable used in Publication 2 and Publication 5, *borderline* and *abnormal* scores from the Total Difficulties score indicated child mental health problems. Alternatively, two metric subscores *internalising (*subscales *emotional symptoms* and *peer relationship problems)* and *externalising symptoms (*subscales *hyperactivity/inattention* and *conduct problems*) (Publication 4) were computed (Goodman, Lamping, & Ploubidis, 2010). The dichotomous variables *internalising* and *externalising mental health problems* included *borderline* and *abnormal* scores (Publication 4). For Publication 5, the mean of the *Total Difficulties* score was used.

Specific mental health problems (Publication 1) assessed in this thesis included internalising *symptoms of depression* and *symptoms of anxiety*, and externalising *symptoms of conduct disorder* and *symptoms of ADHD*. *Symptoms of depression* were assessed using the German version of the Center for Epidemiological Studies Depression Scale for Children (CES-DC); Faulstich et al., 1986; Weissman, Orvaschel, & Padian, 1980). The instrument comprises 20 items referring to the past week, each rated on a four-point Likert scale from *not at all* to *a lot*. A cut-off score of ≥ 16 was used to differentiate between non-clinical and clinically relevant symptom levels. The German translation demonstrated satisfactory factorial validity (Barkmann, Erhart, Schulte-Markwort, & BELLA study group, 2008).

[12] For each score, Cronbach' alpha was computed. All scores demonstrated acceptable (Cronbach's (α ≥ .70) to good or very good internal consistency (Cronbach's (α ≥ .80) (Cronbach, 1951). See also original publications in Chapter 5.

Symptoms of anxiety were assessed using a validated short version of the German Screen for Child Anxiety Related Emotional Disorders (SCARED-5), a five-item short version of the Screen for Child Anxiety Related Emotional Disorders (Birmaher et al., 1999). Each item represents one of the five subscales panic disorder, generalised anxiety, separation anxiety, social phobia, and school anxiety. Responses were rated on a three-point scale from *not true* to *very true* or *often true* and summed to create a total score. Symptom duration is not specified in the instrument (Mittenzwei, 2013). A cut-off score of ≥ 3 was used to indicate clinically relevant anxiety symptoms (Birmaher et al., 1999).

Symptoms of conduct disorder were assessed using the externalising *aggressive behaviour* and *antisocial behaviour* from the CBCL (Working Group German Child Behaviour Checklist [Arbeitsgruppe Deutsche Child Behaviour Checklist], 1998), consisting of a total of 33 items. All items are referring to symptoms observed over the past six months and rated on a three-point scale from *not true* to *very true* or *often true*. The German version of the CBCL demonstrated satisfactory reliability and discriminant validity for the scale used in the BELLA study (Walter & Remschmidt, 1999).

Finally, *symptoms of ADHD* were assessed using the Global Index of the Conners 3® (Lidzba, Christiansen, & Drechsler, 2013). The scale includes 10 items referring to the past month, each rated on a four-point Likert scale from *not at all* to *very much*). A cut-off score of ≥ 16 was used to identify clinically significant symptomatology (Rowe & Rowe, 1997). A custom German translation of the Global Index was used, which demonstrated satisfactory psychometric properties (Erhart, Döpfner, & Ravens-Sieberer, 2008).

HRQoL (Publication 3 and 5) was assessed using the self-report version of the KIDSCREEN-10 Index (Ravens-Sieberer et al., 2006). This instrument provides a global HRQoL score encompassing physical, psychological, and social dimensions by means of ten items (e.g., “Have you felt fit and well?” or “Have you had enough time for yourself?”). Responses are recorded on five-point Likert scales ranging from *not at all* to *extremely*, or from *never* to *always*. For scoring a mean score across all ten items was calculated, resulting in the *Total HRQoL* score. Descriptive data on HRQoL in Publication 5 was calculated by categorising the T-Score using European reference data (The KIDSCREEN Group Europe, 2006). Based on these T-scores (M = 50; SD = 10), participants were categorised into three HRQoL groups: low (< 40), medium (40–60), and high (> 60) (Ravens-Sieberer et al., 2012).

4.2.2. Risk Factors for Mental Health and HRQoL

The risk factors measured in the publications included in this thesis are *parental mental health problems*, *parental age*, *parental unemployment*, *stressful life events*, *parental daily strain*, *difficult family constellation*, and *parental chronic illness or disability*. Details of the respective operationalisations follow:

Parental mental health problems (Publications 2, 3, and 5) were assessed through parent self-report using the German Symptom Checklist Short Version-9 (SCL-S-9), developed by Klaghofer and Brähler (2001). The SCL-S-9 is the short version of the Symptom Checklist-90 Revised Version (SCL-90-R) German version (Franke, 2002). It screens for mental health symptoms experienced over the past seven days regarding nine different dimensions: somatisation, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, anger-hostility, phobic anxiety, paranoid ideation, and psychoticism. Each item is rated on a five-point Likert scale from *none at all* to *very severe*. The sum of all item responses forms the *Global Severity Index* (*GSI*), reflecting the level of parental mental health problems. For Publication 2 and Publication 3, the cut-off score from the SCL-90-R was used (Franke et al., 2002) to identify parental mental health problems. For Publication 5, a mean of all nine items was calculated.

Parental age (Publication 2) was measured through caregiver report, with the responding parent indicating the ages of both the mother and the father. Maternal age was dichotomised into two categories: 44 years or younger and 45 years or older. Paternal age was similarly categorised as 49 years or younger and 50 years or older.

Parental unemployment (Publication 2) was assessed through a single item asking whether one or both parents were currently unemployed.

Stressful life events (Publication 2) were measured using an index based on four dichotomous items, derived from both parent and child reports. Children indicated whether a close person had died or whether their parents had separated or divorced within the past 12 months. The remaining two events included financial strain (reported by parents for children under 13 years, and self-reported by adolescents aged 13 years or older) and whether the child or adolescent had experienced an accident or serious illness (self-reported).

Parental daily strain (Publication 2) was measured using an index composed of 13 items assessing perceived burden related to various domains, such as household responsibilities, partner conflicts, parenting demands, caregiving for a dependent family member, job-related stress, and general work-life balance. Response options ranged from *not at all* to *very strong*. The variable was dichotomised, with responses of strong or very strong indicating *high parental daily strain*.

Difficult family constellation (Publication 2) was assessed using two dichotomous items asking whether the responding parent was a single parent and whether the child or adolescent had three or more siblings.

Lastly, the presence of *parental chronic illness or disability* (Publication 2) was measured with two items asking whether the responding parent or their partner suffered from a chronic

disease or disability (e.g., asthma, diabetes, or rheumatism). Responses were combined into a single variable indicating whether one or both parents were affected.

4.2.3. Protective Factors for Mental Health and HRQoL

Personal factors (Publications 3 and 5) measured in this thesis included *self-efficacy*, *optimism, & social competence*.

Self-efficacy was assessed using the German General Self-Efficacy Scale by Schwarzer and Jerusalem (1995). The ten items are rated on a four-point Likert-scale ranging from *not at all true* to *exactly true*. A mean score was computed across all ten items, with higher values reflecting greater self-efficacy (Publications 3 and 5)

Optimism was measured using a modified version of the German Berne Well-Being Questionnaire (Grob et al., 1991) consisting of four items. Statements such as "My future looks good" were rated by children and adolescents on a six-point scale from *completely false* to *completely true*. A mean score was calculated, with higher values reflecting greater optimism (Publications 3).

Social competence was assessed using five items developed for the Health Behaviour in School-aged Children – HBSC study (Currie, Samdal, Boyce & Smith, 2001). Statements like "I have many friends" were rated on a four-point Likert-scale from *does not describe me at all* to *describes me exactly*. A mean score was calculated, with higher values indicating a better social competence (Publications 3).

Familial factors (Publications 3 and 5) included, i.e., *family climate* and *parental support*:

Family climate was assessed using the self-report of a modified version of the German Family Scale by Schneewind (Schneewind et al., 1985). Eight items (e.g., "In our family, everyone is responsive to each other's concerns and problems" or "Not a weekend goes by without us doing something together") were rated on a four-point Likert-scale ranging from *not true* to *exactly true*. A mean score was calculated, with higher values indicating a more positive family climate (Publications 3 and 5).

Parental support was measured using a modified and shortened version of the Parental Bonding Instrument (PBI) (Parker et al., 1979). Items were taken from the two subscales *Care* and *Overprotection/Control*. Statements such as "My parents/my caregivers are affectionate" were rated by children and adolescents on a three-point Likert-scale from *never* to *almost always*. A mean score was calculated, with higher values indicating greater parental support.

Lastly, the **social factors** (Publication 3 and 5) examined in this thesis include *social support,* and *school climate*:

In Publication 3*, social support* was assessed using the following three items: "How many people are so close to you that you can count on them if you have serious problems?", "How much interest do people take in what you do?" "How easily can you get practical help from your family, friends, or neighbours when you need it?" The three items were answered using different response formats. A mean score was built. In Publication 5, *social support* was measured using the self-report of the Social Support Survey (SSS) (Donald & Ware, 1984). The SSS assesses how often specific types of support are available by means of a five-point rating-scale ranging from *none of the time* to *all of the time*. The mean score was calculated, with higher values indicating greater availability of social support.

School climate (Publication 3) was assessed using five items, with two items referring to teachers (e.g., "How do your teachers evaluate your performance compared to your classmates?"), using a four-point response format from *not good at a*ll to *very good*) and three items referring to classmates (e.g., "Most students in my class are nice and helpful") using a five-point response format from *does not apply at all* to *fully applies*. The mean score was computed, with higher values reflecting a more positive school climate.

4.2.4. Risk Behaviour in Young Adults

Publication 4 of this thesis examines specific negative long-term consequences of externalising mental health problems, such as risk behaviours in your adults.

Problematic alcohol use was measured using the self-report version of the Alcohol Use Disorders Identification Test (AUDIT), a screening instrument developed by the WHO to detect hasardous and harmful alcohol use (Babor, 2011). In this thesis, the three items from the AUDIT *consumption* subscale (AUDIT-C) were analysed to assess alcohol use patterns. Specifically, the *frequency* and *quantity* of alcohol consumption were measured using the items: “How often do you consume an alcoholic drink, such as a glass of wine, beer, mixed drinks, spirits, or liqueur?” and “When you drink alcohol, how many alcoholic beverages do you usually consume in a day?” *Binge drinking* was operationalised using the item: “How often do you consume six or more alcoholic drinks on a single occasion (e.g., at a party)?” To identify individuals engaging in *problematic alcohol use*, a dichotomous variable was created, coding participants as positive if their total *AUDIT-C* score fell within the upper quartile of the sample distribution.

Illegal drug use was operationalised using nine items from the European School Survey Project on Alcohol and Other Drugs (ESPAD) (Hibell et al., 2009; Kraus, Pabst, & Steiner, 2008). Eight dichotomous self-report items assessed lifetime prevalence of various psychoactive

substances that, at the time of data collection, were classified as illegal[13] (e.g., cannabis, LSD[14] or magic mushrooms; party drugs such as ecstasy, amphetamines, speed, or crystal meth; cocaine; crack; heroin). Also included in the category of illegal psychoactive substance were inhalants (e.g., glue or solvents), and prescription medications (e.g., benzodiazepines, antidepressants, antipsychotics). An additional item measured the annual frequency of cannabis use. A dichotomous variable was created to indicate *illegal drug use*, coding participants as positive if they had used cannabis at least 40 times per year and had used at least one other illegal psychoactive substance in their lifetime.

Delinquency was measured using three items derived from ESPAD questionnaire. Participants were asked whether they 1) had ever had trouble with the police, 2) had been accused in a court case, 3) had been required to serve detention hours, or had been in juvenile detention, youth prison, or pretrial detention. Responses were recorded on a 4-point Likert scale, ranging from *does not apply at all* to *applies exactly*. A dichotomous variable was created to assess *delinquency*, with participants who responded affirmatively to at least one of the three items (i.e., *somewhat applies* or *applies exactly*) being coded as positive (Hibell et al., 2009; Kraus, Pabst, & Steiner, 2008).

Propensity to violence was assessed using a six-item scale developed by Schlack and Hölling (2007), and Schlack et al. (2010). Participants rated statements such as “To assert myself, I sometimes have to resort to violence” and “If someone insults me personally, they may end up getting hit” on a four-point scale, ranging from *does not apply at all* to *applies exactly*. A dichotomous variable was constructed for *propensity to violence*, with participants whose total score fell in the upper quartile being coded as positive.

Financial struggles were operationalised using four items that assessed the presence of debts. Participants were asked if they had 1) outstanding debts with family members, 2) with friends or acquaintances, 3) due to a bank loan or a loan with other institutions (e.g., public authorities, telephone companies, mail-order services, landlords, utility providers), or 4) with other creditors. A dichotomous variable for *financial struggles* was created, where participants who answered affirmatively to at least one of the four items were coded as positive.

4.2.5. Sociodemographic Variables

Children and adolescents’ *age* and *gender* were assessed using single items.

Socioeconomic status (*SES*) was measured using the Winkler Index (Winkler & Stolzenberg, 2009), which ranges from 3 to 21 points and is based on parental education, parental

[13] Cannabis use was legalised in Germany in April 2024 (Bundesgesetzblatt. (2024). *Gesetz zum kontrollierten Umgang mit Cannabis und zur Änderung weiterer Vorschriften (Cannabisgesetz — CanG)*, BGBl. I Nr. 109, 27. März 2024).

[14] LSD is the common abbreviation for the drug Lysergic Acid Diethylamid

occupational status, and household income. The continuous *SES* score was used in multivariate analyses. For descriptive and bivariate analyses, *SES* was categorised into the three groups *low* (3 to 8 points), *medium* (9 to 14 points), and *high* (15 to 21 points) (Lampert, Kroll, Muters, & Stolzenberg, 2013) (Publications 2, 3, 4, and 5).

Migration background (Publication 5) was defined as present if either 1) the child or adolescent had immigrated to Germany and had at least one parent who was born abroad, or 2) both parents had immigrated to Germany or did not possess German citizenship.

4.3. Statistical Analyses

This doctoral thesis focussed its statistical analyses on an integrative approach instead of conducting isolated analyses. For all publications descriptive analyses were computed using weighted data. The weight was calculated based on data from the German microcensus with regard to the children's age and gender, and the families' SES (for more information in the weight calculation used in the BELLA study see Ravens-Sieberer et al., 2008a). Where necessary, missing values were replaced using expectation-maximisation (EM)[15] imputation (Dempster et al., 1977). In Publication 5, missing data were handled using Full Information Maximum Likelihood estimation. The scores for the measurement instruments presented in Chapter 4.1 were calculated in accordance with the respective manuals. The score calculation for variables deriving from single items or aggregated items are also summarised in Chapter 4.1.

Descriptive data analyses included the calculation of frequencies, means (*M*), and standard deviations (*SD*). Furthermore, Chi-square-tests, odds ratios (*OR*), and 95% confidence intervals (CI) were calculated to define risks or to compare groups. To interpret the *OR* in Publication 4, the population attributable risk expressed as a percentage (PAR%) was used (Jekel et al., 2007)[16].

Multivariate methods included multiple logistic regression analyses, longitudinal multilevel models (LMLM), and latent growth modelling (LGM). Multiple logistic regression analyses were conducted to examine the associations between predictor variables – such as sociodemographic variables and risk and protective factors – and mental health outcomes (Publications 2 and 3). For Publication 4, each long-term outcome (e.g. illegal drug use, delinquency) was entered as a dependent variable along with other predictors, while

[15] In the EM algorithm missing data is imputed by estimating plausible values based on observed data. The procedure iteratively improves data assignment (Expectation step) and model fit (Maximisation step) until no further improvement occurs. A prerequisite for applying EM imputation is that the proportion of missing values remains below 30%, a requirement that was met. To evaluate the imputation, effect sizes comparing item means before and after imputation were calculated, showing minimal differences with effect sizes ranging from $g = 0.00$ to 0.03, indicating no significant distortion of the data.

[16] The PAR% reflects the proportionate reduction in the incidence of the outcome of interest that could be achieved if the associated risk factor were completely eliminated (Jekel et al., 2007).

externalising behavioural problems were included as the independent variable. LMLMs were used in Publication 1 to examine changes in average scores of the respective screening tools measuring mental health problems over time from ages 7 to 19[17]. Preliminary analyses indicated that multilevel modelling was necessary, as 39% to 72% of the variance in outcomes was due to between-person differences (random effects), with intraclass correlations ranging from .39 to .72. Moreover, multilevel models were tested including random intercepts as well as random and fixed linear, quadratic, and cubic time effects (slopes). Additionally, possible age and gender effects, as well as interaction effects between age and gender, were included. Analyses were conducted separately for self- and parent- reports, and the best-fitting model was selected using the Akaike Information Criterion (AIC; Akaike, 1974). For Publication 5, LGM[18] was used to examine how specific risk and protective factors influence HRQoL in children and adolescents over time. The model included an intercept (baseline HRQoL) and a slope (change in HRQoL over time across three time points – baseline, 1-year follow-up, and 2-year follow-up). Risk and protective factors, as well as age and gender as control variables were included as predictors. Regression models were calculated to assess whether initial HRQoL was predicted by initial risk and protective factors investigated and whether changes of HRQoL were predicted by changes in risk and protective factors. Four more models were calculated to assess whether the relationship between HRQoL and the risk factors were moderated by the protective factors – that is, whether risk factors buffered the impact of risk factors on HRQoL[19].

Statistical analyses were conducted using the software package IBM SPSS version 22.0 (IBM Corp., 2013). The figures of Publication 1 were created using R Version 2.15.3 (R Core Team, 2013). In Publication 5, LGM analyses were conducted using Mplus version 6.11 (Muthén & Muthén, 1998–2011) and regression models were calculated using IBM SPSS version 22.0 (IBM Corp., 2013).

The following chapter provides a summary of each publication – and its respective results – included in this thesis. The original published articles are included after each publication's summary.

[17] Introductory explanations of multilevel terminology are provided in Box 1 of Publication 1 (Klasen et al., 2016, p.13).
[18] LGMs are widely applied in social, psychological, and health research to analyse longitudinal data and are especially well-suited for examining changes in behaviour over time (Curran et al., 1996).
[19] A detailed description of these analyses can be found in Publication 5.

5. Results

This chapter summarises the results of each publication included in this thesis. For each publication, a brief overview of its aims is provided, followed by the research questions, a short description of the analysed sample, and a summary of the main findings[20]. The original publication is then presented, followed by a brief conclusion. Transitional paragraphs have been included to connect the individual publications that comprise this thesis, highlighting their thematic and conceptual links.

5.1. Trajectories of Internalising and Externalising Mental Health Problems in Children and Adolescents

Publication 1

Klasen, F., Petermann, F., Meyrose, A.-K., Barkmann, C., Otto, C., **Haller, A-C.**, Schlack, R., Schulte-Markwort, M., & Ravens-Sieberer, U. (2016). Verlauf psychischer Auffälligkeiten von Kindern und Jugendlichen: Ergebnisse der BELLA-Kohortenstudie [Trajectories of mental health problems in children and adolescents: Results of the BELLA cohort study]. *Kindheit und Entwicklung, 25*(1), 10–20.

Overview

The aim of this first publication was to calculate gender-specific trajectories of internalising and externalising mental health problems to identify patterns over time that distinguish age and gender differences. The results also differentiate between self-report and parent report. The internalising mental health problem investigated were depressive symptoms and symptoms of anxiety, the externalising mental health problems were symptoms of conduct disorder and ADHD. Symptoms of conduct disorder were only available with parental report.

Research Questions

The research questions addressed in this publication include:

1.1 What are the developmental trajectories of the internalising (symptoms of depression and anxiety) and externalising mental health problems (symptoms of conduct disorder and ADHD) in children and adolescents over time?

1.2 How do these trajectories differ between boys and girls?

1.3 What discrepancies exist between self-reports and parent-reports regarding these trajectories?

[20] For more in-depth information please consult the respective publications.

Sample

To address these research questions, data of children and adolescents between the age of 7 and 19 who had provided valid information on at least one of the four outcome variables of internalising and externalising mental health problems at a minimum of one assessment point over the first four measurement points of the BELLA study (baseline, 1-year follow-up, two-year follow up, 6 year-follow-up) were analysed. Self-reports included assessments of children and adolescents aged between 11 and 19 years and between 7 and 19 years for parent-reports. The sample included $N = 3256$ participants (49.0% female). Each of the 3256 respondants could be included in the analysis up to four times, depending on how many time points they had provided data for. In total, 8566 assessments were included in the analysis.

Results

The findings show that trajectories over time of these mental health problems differed depending on the mental health problem, age, gender, and parent- or child-report. In general, internalising mental health problems such as symptoms of depression (measured by the CES-DC) and anxiety (assessed by SCARED-5) increased with age and were almost twice as high in girls compared to boys, whereas externalising mental health problems such as symptoms of conduct disorder (operationalised using the CBCL's subscales *antisocial behaviour* and *aggressive behaviour*) and ADHD (assessed by means of the *Conners Global Index*) decreased with age and were more prevalent in boys. Specifically, more than one-sixth of the children and adolescents reported symptoms of internalising mental health problems such as depression (16.12%; parent-report: 11.2%) or anxiety (15.1%; parent-report: 10.6%). Regarding externalising mental health problems, 12.2% of the children and adolescents reported symptoms of conduct disorder (only parent-report available) and 2.0% reported symptoms of ADHD (parent-report 5.7%).The differences in prevalence depending on child- or parent-report was particularly visible in girls with internalising symptoms, where the gap amounted to about 10%, as 20.8% and 21.4% of the girls reported symptoms of depression and anxiety respectively (parent-report: 12.3% for symptoms of depression and symptoms anxiety respectively). Another notable gap between child- and parent-report was observed in symptoms of ADHD in boys (4.3% with self-report versus 7% parent-report).

Publication 1

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Studie

Verlauf psychischer Auffälligkeiten von Kindern und Jugendlichen

Ergebnisse der BELLA-Kohortenstudie

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Zusammenfassung. Psychische Auffälligkeiten sind in der Kindheit und Jugend häufig und weisen geschlechts- und altersbedingte Unterschiede auf. Aktuelle, bundesweit repräsentative Daten über den Verlauf von psychischen Auffälligkeiten fehlen bisher. Anhand der Angaben von 3 256 Teilnehmern (7 – 19 Jahre) der prospektiven und für Deutschland repräsentativen BELLA-Kohortenstudie wurde mit Mehrebenenmodellen der Verlauf von Depression (CES-DC), Angst (SCARED-5), ADHS (Conners 3) und Störungen des Sozialverhaltens (CBCL) untersucht. Insgesamt zeigten im Elternbericht 11.2 % der Kinder und Jugendlichen klinisch bedeutsame Anzeichen für Depression, 10.6 % für Angst, 5.7 % für ADHS und 12.2 % für Störungen des Sozialverhaltens. Im Selbstbericht wiesen 16.1 % klinisch bedeutsame Symptome für Depression, 15.1 % für Angst und 2.0 % für ADHS auf. Mit zunehmendem Alter nahmen Symptome von ADHS und Störungen des Sozialverhaltens ab, während internalisierende Auffälligkeiten zunahmen. Symptome von Depression und Angst traten häufiger bei Mädchen auf, Symptome von ADHS und Störungen des Sozialverhaltens häufiger bei Jungen. Eltern schätzten die internalisierenden Auffälligkeiten ihrer Kinder niedriger ein als diese selbst. Für die klinische Praxis sind eine störungsspezifische, entwicklungs- und geschlechtssensitive Diagnostik und Behandlung von großer Bedeutung.

Schlüsselwörter: Psychische Auffälligkeiten, Depression, Angst, ADHS, Störungen des Sozialverhaltens

Trajectories of Mental Health Problems in Children and Adolescents: Results of the BELLA Cohort Study

Abstract. Mental health problems in childhood and adolescence are widespread. Current results from longitudinal studies give inconsistent information about the trajectories of internalizing and externalizing problems. Studies show inconsistent prevalence rates of mental health problems depending on gender and age as well as between self- and parent report. So far, little is known about the developmental course of mental health problems over the entire childhood and adolescence period in Germany. The aim of the present study was to identify the trajectories of mental health problems in childhood and adolescence for (a) different psychiatric disorders, (b) for boys and girls separately, and (c) for self- and parent report. The longitudinal BELLA study is the mental health module of the German National Health Interview and Examination Survey among children and adolescents (KiGGS). Data of 3,256 participants of the BELLA study aged between 7 and 19 years from up to four measurement points were analyzed to estimate the trajectories of depression (CES-DC), anxiety disorders (SCARED-5), attention deficit hyperactivity disorder (ADHD; Conners Global Index), and conduct disorder (CBCL) using mixed models for longitudinal data. According to parent report, 11.2 % of the children and adolescents showed clinically relevant symptoms of depression, 10.6 % of anxiety, 5.7 % of ADHD, and 12.2 % of conduct disorder. According to self-report 16.1 % showed clinically relevant symptoms of depression, 15.1 % of anxiety, and 2.0 % of ADHD. Over the entire period of childhood and adolescence, symptoms of ADHD and conduct disorder decreased and were more frequent in boys, whereas internalizing problems (depression and anxiety) increased and were about twice as high in girls compared with boys. Furthermore, girls rated their internalizing problems approximately 10 % higher than their parents did (depression: 20.8 % vs. 12.3 %; anxiety: 21.4 % vs. 12.3 %). The prevalence rate for internalizing problems among boys was about 10 % for the parent as well as self-report. For boys, parents indicated more symptoms of ADHD than their children themselves (7 % vs. 4.3 %). For girls, there was

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Die Mitglieder der BELLA study group sind: Ulrike Ravens-Sieberer und Fionna Klasen, Hamburg (Projektleiterinnen); Claus Barkmann, Hamburg; Monika Bullinger, Hamburg; Manfred Döpfner, Köln; Beate Herpertz-Dahlmann, Aachen; Heike Hölling, Berlin; Franz Petermann, Bremen; Franz Resch, Heidelberg; Aribert Rothenberger, Göttingen; Sylvia Schneider, Bochum; Michael Schulte-Markwort, Hamburg; Robert Schlack, Berlin; Frank Verhulst, Rotterdam; Hans-Ulrich Wittchen, Dresden.

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no difference between parent and child report (2 %, respectively). Prevalence rates for parent-rated conduct disorder were about 12 % for girls and boys. A substantial percentage of children and adolescents in Germany show clinically relevant symptoms in any developmental stage. The trajectories of mental health problems over the entire childhood and adolescence period differ between depression, anxiety disorders, ADHD, and conduct disorder as well as between parent and self-report. Children's gender and age influence the developmental course meaningfully. These aspects should be taken into account for future prevention programs, diagnostics, and interventions.

Keywords: mental health problems, depression, anxiety, ADHD, conduct disorder

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Psychische Auffälligkeiten treten in Kindheit und Jugend häufig auf und sind neben den individuellen Konsequenzen für die betroffenen Familien auch mit hohen gesellschaftlichen Kosten verbunden, wie Einbußen in Produktivität, Kosten im Gesundheits- und Erziehungssektor sowie enormen Belastungen für den Sozialstaat insgesamt (Belfer, 2008; Ewest, Reinhold, Vloet, Wenning & Bachmann, 2013). Erkenntnisse zum Verlauf psychischer Störungen in Kindheit und Jugend vermitteln epidemiologische Studien. Diese reichen von deskriptiven Querschnittsstudien ab den 1960er Jahren, in denen psychische Auffälligkeiten häufig nur ad hoc und per Fremdurteil erhoben wurden, bis hin zu aktuellen, großen, prospektiven Kohortenstudien, in denen psychische Auffälligkeiten multiperspektivisch nach internationalen diagnostischen Kriterien eingeschätzt und häufig auch biologische Indikatoren erhoben werden (Verhulst & Tiemeier, 2015).

Die Prävalenz psychischer Auffälligkeiten liegt bei deutschen Kindern und Jugendlichen bei um die 20 % (Barkmann & Schulte-Markwort, 2010; Hölling et al., 2014). Dies stimmt auch mit internationalen Studien überein (Belfer, 2008). Ca. 50 % aller psychischer Störungen beginnen vor dem 14. Lebensjahr (Kessler et al., 2005).

Neben der hohen allgemeinen Prävalenz zeigen sich auch in den einzelnen Störungsbereichen hohe Häufigkeiten. Klinisch bedeutsame Symptome von Depression treten bei 11.0 % und Symptome von Angst bei 11.4 % der deutschen Jungen und Mädchen auf. ADHS zeigen 8.7 % der Kinder und Jugendlichen, während Anzeichen für Störungen des Sozialverhaltens bei 14.6 % vorliegen (Ravens-Sieberer et al., 2008).

Die Prävalenzen aller psychischen Störungen weisen alters- und geschlechtsbedingte Unterschiede auf. Costello et al. (2011) fassten Ergebnisse wichtiger Studien kürzlich in einem Literaturüberblick, wie im Folgenden beschrieben, zusammen. Internalisierende Auffälligkeiten zeigen in der Kindheit einen Anstieg der Prävalenzen, während der Verlauf in der weiteren Entwicklung nicht eindeutig ist. Depressive Störungen steigen von der Kindheit bis in die Adoleszenz an. Dieser Anstieg ist allerdings meist nur für Mädchen signifikant. Im weiteren Verlauf lassen sich sowohl Hinweise auf einen mäßigen Anstieg als auch auf eine mäßige Abnahme finden. Ähnliche Ergebnisse zeigen sich für Angststörungen. Mit zunehmendem Alter lässt sich zunächst ein Anstieg verzeichnen. Anschließend werden sowohl steigende als auch abfallende Tendenzen berichtet. Spezifische Phobien, Soziale Phobie, Trennungsangst und Generalisierte Angststörung nehmen ab, während Panikstörungen und Agoraphobie ansteigen. Auch die Befunde zum Verlauf von externalisierenden Auffälligkeiten unterscheiden sich. ADHS nimmt im Laufe der Entwicklung von Kindheit hin zum Erwachsenenalter für beide Geschlechter gleichermaßen ab. Die Ergebnisse für die Störungen des Sozialverhaltens sind widersprüchlich. Während einige Studien mit fortschreitendem Alter einen Anstieg der Symptomatik feststellten, fanden andere eine Abnahme sowohl für Jungen als auch für Mädchen oder gleichbleibende Werte (vergl. Costello et al., 2011).

Es gilt inzwischen als Goldstandard, psychische Auffälligkeiten im Kindes- und Jugendalter multiperspektivisch einzuschätzen (Holmbeck, Li, Schurman, Friedman & Coakley, 2002). Insbesondere bei der Erfassung internalisierender Symptome sollte das Selbsturteil erfragt werden, da Eltern dazu neigen, diese Symptome zu übersehen (Holmbeck et al., 2002; Seiffge-Krenke & Kollmar, 1998). Bei externalisierendem Verhalten berichten die Eltern häufig mehr Probleme als ihre Kinder (Seiffge-Krenke & Kollmar, 1998). Außerdem sind sich Experten heute weitgehend einig, dass Kinder ab ungefähr acht Jahren zuverlässig Auskunft über ihren Gesundheitszustand geben können (Riley et al., 2004).

Fragestellung

Bisher fehlen für Deutschland aktuelle Informationen über den Entwicklungsverlauf von psychischen Auffälligkeiten über die gesamte Kindheit und Jugend, insbesondere für (a) verschiedene Störungsbereiche, (b) getrennt für Jungen und Mädchen und (c) getrennt nach Selbst- und Elternurteil. Unser Ziel ist es daher, den Verlauf von vier psychischen Störungen (Depression, Angst, ADHS, Störungen des Sozialverhaltens) bei Kindern und Jugendlichen im Alter von 7 bis 19 Jahren getrennt nach Ge-

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schlecht und Befragungsperspektive (Selbst- und Elternurteil) zu beschreiben.

Methoden

Die Analysen beruhen auf Daten der *Befragung zum seelischen Wohlbefinden und Verhalten* (BELLA-Studie). Das Studiendesign und die Studiendurchführung sind bei Ravens-Sieberer, Klasen und Petermann (2016) beschrieben.

Stichprobe

Für die folgenden Analysen wurden Teilnehmer der BELLA-Studie ausgewählt, die zu mindestens einem der vier Outcome-Merkmale (Depression, Angst, ADHS, Störungen des Sozialverhaltens) zu mindestens einem Erhebungszeitpunkt gültige Angaben gemacht hatten und zum Zeitpunkt der Befragung für das Elternurteil 7 bis 19 Jahre und für das Selbsturteil 11 bis 19 Jahre alt waren. In die Stichprobe gingen 3 256 Befragte ein (49.0 % Mädchen), von denen 2 863 aus der Basiskohorte und 393 aus den zum vierten Messzeitpunkt neu rekrutierten Teilnehmern stammten. Das mittlere Alter lag bei Basiserhebung für die Elternbefragung bei 11.78 Jahren (*SD*=3.15) und für die Selbstbefragung bei 13.93 Jahren (*SD*=2.01).

In die Analyse ging jeder der 3 256 Befragten bis zu viermal ein, je nach dem zu wie vielen Messzeitpunkten Angaben vorlagen. Insgesamt wurden so 8 566 Urteile einbezogen. Eltern- und Selbsteinschätzung lagen für 5 697 (66.5 %) der 8 566 Urteile vor, nur die Elterneinschätzung für 2 774 (32.4 %) und nur die Selbsteinschätzung für 95 (1.1 %) Urteile. Aufgeteilt nach Messzeitpunkten wurden 2 863 Urteile aus dem ersten Messzeitpunkt, 2 420 aus dem zweiten Messzeitpunkt, 2 171 aus dem dritten Messzeitpunkt und 1 112 aus dem letzten Messzeitpunkt berücksichtigt. Pro Alterskohorte lagen zwischen 508 und 910 Urteile vor, nur die jüngste und älteste Kohorte waren mit 272 (7 Jahre) und 174 Urteilen (19 Jahre) geringer besetzt.

Erhebungsverfahren

Depression

Depressive Symtome wurden mit der Center for Epidemiological Studies Depression Scale for Children (CES-DC, Weissman, Orvaschel & Padian, 1980) erfasst. Die CES-DC beinhaltet 20 Items, die auf einer vierstufigen Skala beantwortet werden (0 = *überhaupt nicht*, 1 = *ein wenig*, 2 = *ziemlich*, 3 = *sehr*) und sich auf die vergangene Woche beziehen. Als Cut-off-Wert für die Einteilung in *unauffällig* versus *auffällig* wurde ein Wert von ≥16 eingesetzt (Weissman et al., 1980). Für die eigens angefertigte deutsche Übersetzung der CES-DC konnte bei ihrer psychometrischen Überprüfung eine zufriedenstellende faktorielle Validität festgestellt werden (Barkmann, Erhart, Schulte-Markwort & BELLA study group, 2008).

Angst

Symptome von Angst wurden mit dem SCARED-5 (Birmaher et al., 1999), der aus fünf Items bestehenden Kurzversion des Screen for Child Anxiety Related Emotional Disorders (Birmaher et al., 1999), erhoben. Jedes Item repräsentiert dabei eine der fünf Subskalen *Panikstörung, Generalisierte Angst, Trennungsangst*, *Soziale Phobie* und *Schulangst*. Die Antworten werden auf einer dreistufigen Skala kodiert (0 = *trifft nicht oder fast nie zu*, 1 = *trifft manchmal oder etwas zu*, 2 = *trifft genau oder häufig zu*) und zu einem Gesamtwert addiert. Die Dauer der Symptome wird nicht spezifiziert (Mittenzwei, 2013). Nach Birmaher et al. (1999) wurden Kinder und Jugendliche ab einem Cut-off-Wert ≥ 3 als *auffällig* kategorisiert. Der SCARED liegt in deutscher Übersetzung vor (Mittenzwei, 2013). Reliabilität und Validität des SCARED-5 erwiesen sich als gut und sind vergleichbar mit den Werten der Langversion (Birmaher et al., 1999).

ADHS

ADHS wurde mit dem Global-Index des Conners 3® erhoben (Lidzba, Christiansen & Drechsler, 2013). Die zehn Fragen beziehen sich auf den letzten Monat und werden auf einer vierstufigen Skala beantwortet (1 = *überhaupt nicht*, 2 = *ein wenig*, 3 = *ziemlich*, 4 = *sehr viel*). Die Conners-Skalen gelten als objektive, reliable und valide Verfahren zur Erfassung von Aufmerksamkeitsstörungen im Kindes- und Jugendalter (Lidzba et al., 2013). Der Cut-off-Wert lag bei ≥16 (Rowe & Rowe, 1997). Es wurde eine eigens angefertigte, deutsche Übersetzung des Global-Index verwendet, deren psychometrische Eigenschaften zufriedenstellend waren (Erhart, Döpfner & Ravens-Sieberer, 2008).

Störungen des Sozialverhaltens

Störungen des Sozialverhaltens wurden über die deutsche Version der Child Behavior Checklist (CBCL, Achenbach, 1991; Arbeitsgruppe Deutsche Child Behavior Checklist, 1998) mit Hilfe der Skala *Externalisierende Auffälligkeiten* erfasst, die aus 33 Items mit den Subskalen Aggressives Verhalten (20 Items) und Dissoziales Verhalten (13 Items) besteht. Die Items beziehen sich auf Symptome während der

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letzten sechs Monate. Sie werden auf einer dreistufigen Skala beantwortet (0 = *nicht zutreffend (soweit bekannt)*, 1 = *etwas oder manchmal zutreffend*, 2 = *genau oder häufig zutreffend*). Der Cut-off-Wert lag für Jungen bis einschließlich 11 Jahren bei ≥17, für Jungen ab 12 Jahren bei ≥18 und für alle Mädchen bei ≥ 14 (Arbeitsgruppe Deutsche Child Behavior Checklist, 1998). Eine Untersuchung der deutschen Version der CBCL ergab eine befriedigende Reliabilität und diskriminative Validität für die in BELLA verwendete Skala (Walter & Remschmidt, 1999).

Alle Erhebungsverfahren wurden in Selbst- und Elternversion vorgelegt, einzig die Items zur Störungen des Sozialverhaltens wurden nur aus Elternperspektive erhoben. Die hier analysierten Daten stammten alle aus dem Telefoninterview (einzige Ausnahme: die CBCL wurde zum letzten Messzeitpunkt im schriftlichen Fragebogen eingesetzt). In der vierten Befragung wurden die Verfahren in beiden Perspektiven erst ab 13 Jahren eingesetzt.

Statistische Analysen

Um sowohl die Veränderung in den Durchschnittswerten als auch die Unterschiede zwischen den Personen untersuchen zu können, wurde der Verlauf von psychischen Auffälligkeiten über die Zeit (Alter 7–19 Jahre, Einschluss von Alterskohorten mit Daten von mindestens 50 Personen) mit *längsschnittlichen Mehrebenenmodellen* untersucht. Einführende Erklärungen in die Mehrebenen-Terminologie sind in Kasten 1 enthalten.

Kasten 1. Mehrebenenmodelle

Mehrebenenmodelle bieten die Möglichkeit sowohl die durchschnittlichen Effekte über alle Personen hinweg (auch: *feste* Effekte, engl. fixed effects) als auch die individuellen Unterschiede zwischen den einzelnen Personen (auch: *zufällige* Effekte, engl. random effects) zu untersuchen. Diese Modelle enthalten ein *Interzept*, das das Ausgangsniveau angibt, sowie *Slopes*, die das Wachstum bzw. die Veränderung über die Zeit beschreiben (Zeiteffekte). In den vorliegenden Analysen wurde eine mögliche lineare, quadratische und kubische zeitliche Veränderung untersucht. Ein quadratischer oder kubischer Zeiteffekt zusätzlich zu einem linearen Anstieg oder Abfall beschleunigt den Verlauf oder flacht diesen ab. Zur Verbesserung der Modellgüte können weitere Einflussfaktoren neben der Zeit aufgenommen werden. In die vorliegenden Analysen wurden der Einfluss von Geschlecht, Alter und die Interaktion von Alter und Geschlecht einbezogen.

Ein Überblick über Mehrebenen-Modelle findet sich bei Verbeke und Molenberghs (2000).

Vorabanalysen zeigten, dass die Verwendung von Mehrebenenmodellen unbedingt erforderlich ist, da die Variation der Werte bei allen vier Outcome-Merkmalen zu mindestens 39 % auf Unterschiede zwischen den einzelnen Personen (*zufällige* Effekte) zurückzuführen waren (Intra-Klassen-Korrelation (ICC) .39 bis .72). Die alleinige Verwendung von Durchschnittswerten über alle Personen (nur *feste* Effekte) wäre damit unzureichend.

Konkret wurden Mehrebenenmodelle mit *zufälligen Interzepts* und *zufälligen* sowie *festen* linearen, quadratischen und kubischen *Zeiteffekten (slopes)* getestet. Zusätzlich wurden mögliche Alters- und Geschlechtseffekte sowie Interaktionseffekte zwischen Alter und Geschlecht aufgenommen. Die Modelle wurden für Selbst- und Elternurteil getrennt analysiert. Das am besten passende Modell wurde mit Hilfe des Akaike Information Criterions (AIC, Akaike, 1974) ausgewählt. Zur Präsentation der Resultate wurden Grafiken erstellt, die auf den geschätzten Randmitteln der dargestellten Variablen aus den bestangepassten Mehrebenenmodellen basieren. Bei der Berechnung der Datengrundlage für die Grafiken wurden die Verläufe mit lokalen Regressionen geglättet. Fehlende Werte mussten nicht ersetzt werden, da gemischte Modelle diesen gegenüber robust sind. In den Abbildungen stellt der Cut-off-Wert der abhängigen Variablen jeweils den Maximalwert der Skala auf der y-Achse dar.

Alle Analysen wurden mit SPSS Version 22.0 (PASW Statistics for Windows, Version 22.0. Chicago: SPSS Inc.) durchgeführt. Die Grafiken wurden mit R Version 2.15.3 erstellt.

Ergebnisse

Insgesamt zeigten im Elternbericht 11.2 % der Kinder und Jugendlichen klinisch bedeutsame Anzeichen für Depression, 10.6 % für Angst, 5.7 % für ADHS und 12.2 % für Störungen des Sozialverhaltens. Im Selbstbericht wiesen 16.1 % klinisch bedeutsame Symptome für Depression, 15.1 % für Angst und 2.0 % für ADHS auf. Dabei gaben Mädchen die Prävalenz ihrer internalisierenden Auffälligkeiten um etwa 10 % höher an als ihre Eltern (Depression: 20.8 % vs. 12.3 %, Angst: 21.4 % vs. 12.3 %, siehe Tab. 1 und Tab. 2). Für Jungen lag die Häufigkeit internalisierender Auffälligkeiten sowohl im Selbst- als auch im Elternurteil bei etwa 10 %. Klinisch bedeutsame ADHS-Symptome wurden von den Eltern für Jungen häufiger angegeben als in deren Selbsteinschätzung (7 % vs. 4.3 %, siehe Tab. 1 und Tab. 2). Für Mädchen wurde die Häufigkeit klinisch bedeutsamer ADHS-Symptome aus beiden Perspektiven auf etwa 2 % eingeschätzt. Störungen des

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Sozialverhaltens wurden von den Eltern für beide Geschlechter mit ca. 12% angegeben (siehe Tab. 1 und Tab. 2).

Statistisch signifikante Kohorteneffekte traten lediglich bei selbstberichteten Depressions- (η_p^2 = .026) und selbstberichteten ADHS-Werten (η_p^2 = .025) auf. Nach Cohen (1988) sind diese Effekte als klein einzustufen. Bei allen anderen Outcome-Variablen zeigte sich kein Kohorteneffekt. Von systematischen Unterschieden zwischen den Entwicklungsverläufen unterschiedlicher Geburtskohorten ist also nicht auszugehen.

Im Folgenden werden zunächst die bestangepassten Mehrebenenmodelle für die sieben Outcome-Variablen kurz charakterisiert und daraufhin die Ergebnisse beschrieben. Zu beachten ist dabei, dass die Ergebnisse im Folgenden nicht mehr auf Werten über dem Cut-off beruhen, sondern mittlere Symptom-Ausprägungen sind. Das bestangepasste Modell für Depression aus Elternperspektive beinhaltete ein festes (b = 8.90, SE = 0.56, $p \leq .001$) und ein zufälliges Interzept (b = 15.79, SE = 0.69, $p \leq .001$) sowie eine signifikante Interaktion aus Alter und Geschlecht (F(12, 6871.19) = 2.98, $p \leq .001$). Das bestangepasste Modell für Depression aus Selbstperspektive enthielt zusätzlich zum festen (b = 11.90, SE = 0.65, $p \leq .001$) und zufälligen Interzept (b = 23.98, SE = 1.51, $p \leq .001$) sowie einer Alters- und Geschlechtsinteraktion (F(8, 3836.94) = 4.48, $p \leq .001$) signifikante feste lineare (b = -0.62, SE = 0.13, $p \leq .001$) und quadratische (b = 0.09, SE = 0.02, $p \leq .001$) Zeiteffekte (*slopes*), einen zufälligen linearen Zeiteffekt (b = 0.80, SE = 0.15, $p \leq .001$) sowie Alters- und Geschlechtseffekte (F(8, 3836.94) = 4.48, $p \leq .001$; F(1, 2679.34) = 50.88, $p \leq .001$). Die bestangepassten Modelle für Angst aus Eltern- und aus Selbstperspektive beinhalteten jeweils statistisch signifikante feste lineare Zeiteffekte (Eltern: b = 0.02, SE = 0.01, p = .037; Selbst: b = -0.02, SE = 0.01, p = .018) mit festen (b = 0.77, SE = 0.09, $p \leq .001$; b = 1.77, SE = 0.10, $p \leq .001$) sowie zufälligen Interzepts (b = 0.98, SE = 0.04, $p \leq .001$; b = 1.03, SE = 0.06, $p \leq .001$) und zufälligen linearen Zeiteffekten (b = 0.02, $SE \leq 0.01$, $p \leq .001$; b = 0.02, $SE \leq 0.01$, $p \leq .001$). Alter (F(12, 5622,18) = 8.02, $p \leq .001$; F (8, 3807.52) = 2.08, p = .035) und Geschlecht (F(1, 2783.75) = 23.24, $p \leq .001$; F(1, 2358.01) = 181.36, $p \leq .001$) waren jeweils signifikante feste Effekte. Das bestangepasste Modell für ADHS aus der Selbstperspektive beinhaltete signifikante feste lineare (b = -0.53, SE = 0.07, $p \leq .001$) und quadratische Zeiteffekte (b = 0.06, SE = 0.01, $p \leq .001$) mit einem festen (b = 6.50, SE = 0.34, $p \leq .001$) sowie zufälligen Interzept (b = 10.60, SE = 0.53, $p \leq .001$) und einem zufälligen linearen Zeiteffekt (b = 0.32, SE = 0.04, $p \leq .001$). Alters- und Geschlechtseffekte waren einzeln (F(8, 3723.13) = 2.75, p = .005; F(1, 2623.93) = 5.87, p = .015) und in der Interaktion (F(8, 3642.90) = 3.39, p = .001) signifikant. Das bestangepasste Modell für ADHS aus Elternperspektive beinhaltete zusätzlich zum festen (b = 5.36, SE = 0.37, $p \leq .001$) und zufälligen Interzept (b = 20.30, SE = 0.70, $p \leq .001$), festen linearen (b = -0.62, SE = 0.09, $p \leq .001$) und quadratischen Zeiteffekten (b = 0.17, SE = 0.04, $p \leq .001$) sowie einem zufälligen linearen Zeiteffekt (b = 1.17, SE = 0.24, $p \leq .001$) einen festen kubischen (b = -0.01, $SE \leq 0.01$, p = .008) sowie einen zufälligen quadratischen Zeiteffekt (b = 0.01, $SE \leq 0.01$, p = .001). Alters- und Geschlechtseffekte waren auch in der Elternperspektive einzeln (F(12, 4627.51) = 8.07, $p \leq .001$; F(1, 2966.53) = 24.23, $p \leq .001$) und in der Interaktion (F(12, 4332.31) = 3.38, $p \leq .001$) signifikant. Das bestangepasste Modell für Störungen des Sozialverhaltens aus Elternperspektive enthielt signifikante feste lineare Zeiteffekte (b = -0.43, SE = 0.14, p = .002) mit einem festen (b = 6.07, SE = 0.50, $p \leq .001$) und zufälligen Interzept (b = 39.54, SE = 1.44, $p \leq .001$) und einem zufälligen linearen (b = 5.66, SE = 1.24, $p \leq .001$), quadratischen (b = 0.91, SE = 0.21, $p \leq .001$) und kubischen Zeiteffekt (b = 0.01, $SE \leq 0.01$, $p \leq .001$). Alters- und Geschlechtseffekte lagen vor (F(12, 3866.91) = 2.40, p = .004; F(1, 2465.58) = 28.78, $p \leq .001$).

Mädchen berichteten fast doppelt so häufig wie Jungen von depressiven Symptomen. Diese stiegen bei Mädchen bis zum 18. Lebensjahr kontinuierlich an und fielen danach leicht ab (siehe Abb. 1). Jungen berichteten im Alter von 11 Jahren durchschnittlich sogar mehr erhöhte Depressions-Werte als Mädchen. Anschließend fielen die selbstberichteten Werte für Jungen bis zum 13. Lebensjahr deutlich ab und stiegen bis zum Alter von 19 Jahren wieder stetig an. Die von Eltern berichteten Depressions-Werte stiegen für Jungen und Mädchen von 7 bis 11 Jahren leicht an. Dabei lagen die Werte der Jungen höher als die der Mädchen. Jedoch fielen die Depressions-Werte der Jungen aus dem Elternurteil von 11 bis 15 Jahren deutlich ab und lagen ab dem 14. Lebensjahr unter den Werten für die Mädchen. Ab dem 13. Lebensjahr stiegen die Depression-Werte von Mädchen auch im Elternurteil stetig an und erreichten ihren vorläufigen Höhepunkt um das 18. Lebensjahr.

Mädchen berichteten häufiger Angstsymptome als Jungen. Der mittlere Verlauf über das Alter war dabei leicht ansteigend und verlief bei beiden Geschlechtern ähnlich (siehe Abb. 2). Die Häufigkeit der von Eltern berichteten Angstsymptome fiel über die beobachtete Altersspanne ab und war insbesondere für Mädchen deutlich niedriger als die der selbstberichteten Symptome.

Die Häufigkeit der von Eltern berichteten ADHS-Symptome fiel im Alter von 7 bis 19 Jahre statistisch signifikant ab (siehe Abb. 3), von insgesamt 9.3% auf 1.8% für Jungen und von 6.6% auf 2.8% für Mädchen (siehe Tab. 1). Die selbstberichteten ADHS-Symptome blieben dagegen auf niedrigerem Niveau und variieren relativ konstant um die 2%. Bei Mädchen nahmen sie ab 12 Jahren sogar stetig leicht zu (siehe Tab. 2). Es zeigte sich ein signifikanter Interakti-

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Tabelle 1. Anzahl und Prozent der Urteile über Cut-Off aus Elternperspektive

	Depression				Angst				ADHS				Störungen des Sozialverhaltens			
	Jungen		Mädchen		Jungen		Mädchen		Jungen		Mädchen		Jungen		Mädchen	
	N	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%
7 Jahre	9	6.0%	8	6.6%	17	11.3%	21	17.2%	14	9.3%	8	6.6%	21	15.3%	14	13.1%
8 Jahre	32	11.9%	24	10.7%	36	13.3%	48	21.4%	31	11.5%	18	8.0%	34	13.9%	29	13.2%
8 Jahre	52	13.4%	34	10.3%	48	12.4%	43	13.0%	40	10.3%	15	4.5%	41	12.1%	42	13.4%
10 Jahre	44	11.2%	41	11.6%	49	12.4%	57	16.1%	32	8.1%	16	4.5%	54	15.6%	41	12.6%
11 Jahre	53	13.9%	43	12.4%	45	11.8%	51	14.7%	45	11.9%	14	4.0%	42	13.2%	39	12.7%
12 Jahre	46	12.8%	29	10.0%	32	8.9%	31	10.8%	20	5.6%	17	5.9%	36	11.0%	37	13.9%
13 Jahre	42	11.5%	32	9.8%	32	8.8%	38	11.6%	27	7.4%	12	3.7%	38	11.8%	36	12.1%
14 Jahre	36	8.8%	47	11.5%	32	7.9%	42	10.2%	24	5.9%	18	4.4%	48	12.5%	46	12.6%
15 Jahre	44	9.8%	58	13.8%	33	7.3%	42	10.0%	25	5.6%	11	2.6%	53	13.2%	48	12.2%
16 Jahre	45	11.2%	52	12.4%	19	4.7%	49	11.7%	18	4.5%	18	4.3%	38	10.1%	56	14.8%
17 Jahre	31	8.6%	59	15.1%	13	3.6%	34	8.7%	11	3.1%	17	4.4%	24	7.5%	43	12.0%
18 Jahre	28	12.5%	48	19.3%	16	7.1%	27	10.9%	5	2.2%	4	1.6%	14	7.3%	20	8.7%
19 Jahre	5	8.9%	18	16.7%	3	5.4%	8	7.4%	1	1.8%	3	2.8%	1	2.1%	4	4.7%
Gesamt	**467**	**11.1%**	**493**	**12.3%**	**375**	**8.9%**	**491**	**12.3%**	**293**	**7.0%**	**171**	**4.3%**	**444**	**11.8%**	**455**	**12.5%**

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Tabelle 2. Anzahl und Prozent der Urteile über Cut-Off aus Selbstperspektive

	Depression				Angst				ADHS			
	Jungen		Mädchen		Jungen		Mädchen		Jungen		Mädchen	
	N	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%
11 Jahre	55	15.0%	45	13.4%	41	11.2%	62	18.4%	13	3.6%	4	1.2%
12 Jahre	32	9.0%	40	14.1%	36	10.2%	52	18.3%	5	1.4%	1	0.4%
13 Jahre	34	9.6%	53	16.3%	31	8.7%	59	18.2%	3	0.8%	4	1.2%
14 Jahre	37	9.2%	73	18.9%	30	7.4%	71	18.3%	9	2.2%	8	2.1%
15 Jahre	46	10.7%	105	25.6%	31	7.2%	90	22.0%	5	1.2%	13	3.2%
16 Jahre	45	11.5%	105	25.5%	27	6.9%	100	24.3%	8	2.0%	10	2.4%
17 Jahre	42	12.2%	101	26.2%	34	9.9%	101	26.2%	6	1.7%	12	3.1%
18 Jahre	27	13.9%	57	22.6%	16	8.2%	59	23.4%	4	2.1%	6	2.4%
19 Jahre	8	16.0%	25	23.4%	4	8.0%	27	25.2%	-	-	5	4.7%
Gesamt	**326**	**11.3%**	**604**	**20.8%**	**250**	**8.7%**	**621**	**21.4%**	**53**	**1.8%**	**63**	**2.2%**

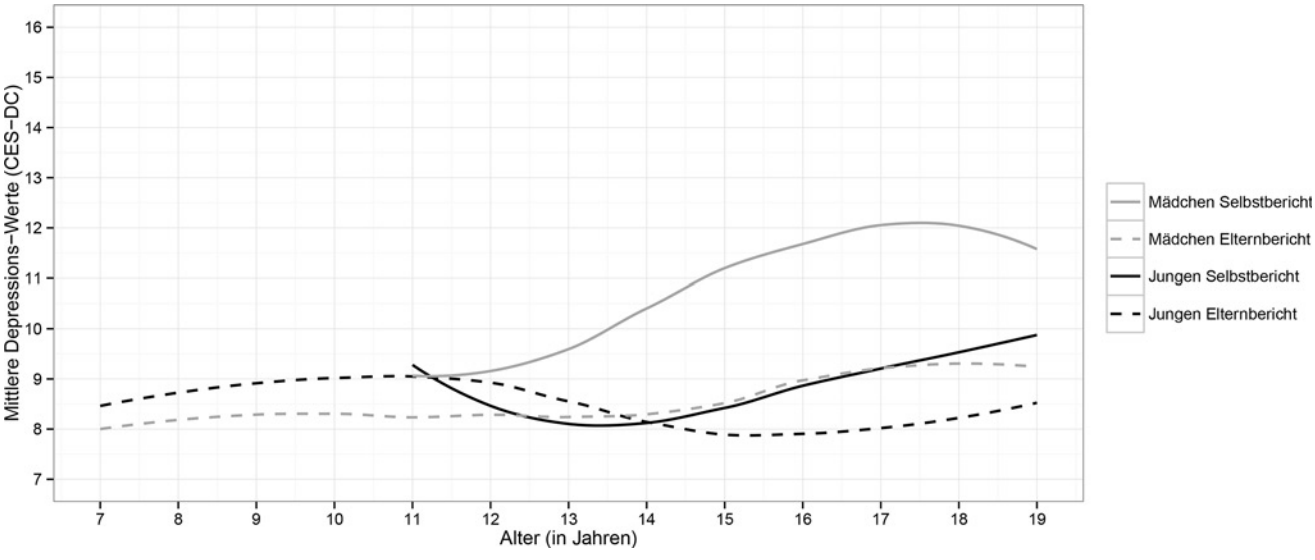


Abbildung 1. Mittlere Depressionssymptome im Alter von 7 bis 19 Jahren nach Geschlecht und Befragungsperspektive.

onseffekt. Von 11 bis 13 Jahren wiesen Jungen mehr selbstberichtete ADHS-Symptome auf als Mädchen, aber ab 13 Jahren zeigten Mädchen in der Selbstperspektive und ab 17 Jahren in der Elternperspektive mehr ADHS-Symptome als Jungen (siehe Abb. 3).

Eltern berichteten über einen kontinuierlichen Abfall von Symptomen von Störungen des Sozialverhaltens über die Altersspanne. Die Werte lagen für Jungen signifikant über den Werten von Mädchen (siehe Abb. 4). Jedoch fielen die Werte für Jungen insbesondere nach dem 14. Lebensjahr ab und lagen im Alter von 19 Jahren sogar knapp unter denen von Mädchen.

Neben den mittleren Symptomverläufen zeigten die signifikanten zufälligen Zeiteffekte für alle Outcomes, dass es signifikante individuelle Unterschiede gibt und sich die beobachteten Kinder und Jugendlichen nicht alle in dieselbe Richtung entwickeln.

Diskussion

In der vorliegenden Arbeit wurde der Verlauf von psychischen Auffälligkeiten für Kinder und Jugendliche in Deutschland im Alter von 7 bis 19 Jahren aus zwei Befragungsperspektiven für jede Alterskohorte und für vier Störungsbilder dargestellt. Es zeigten sich in Überein-

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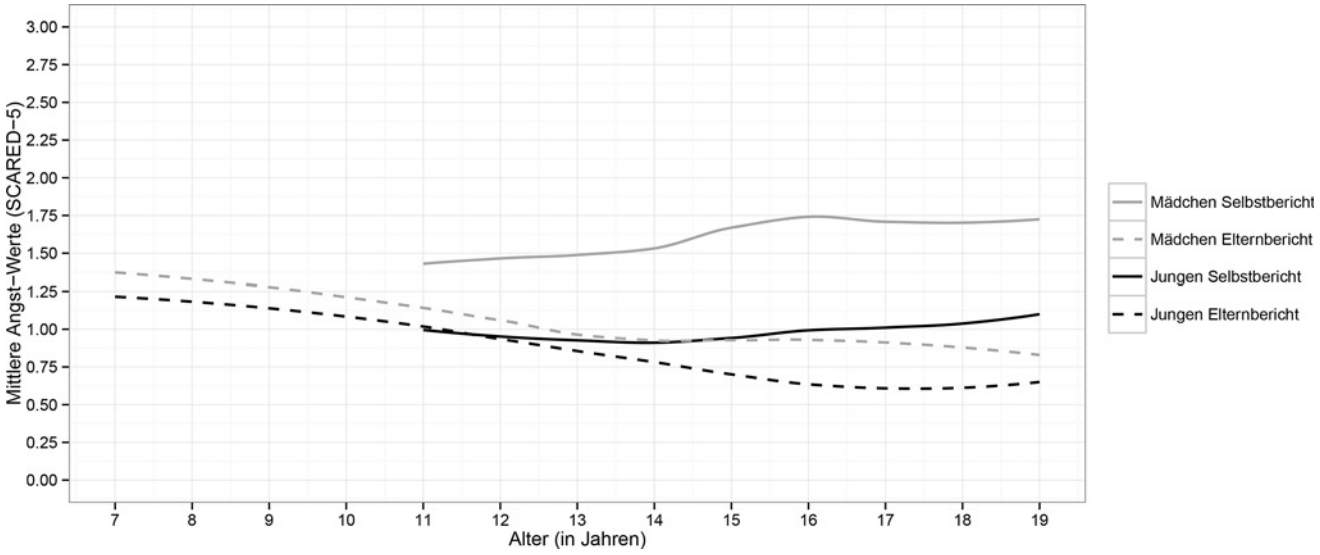


Abbildung 2. Mittlere Angstsymptome im Alter von 7 bis 19 Jahren nach Geschlecht und Befragungsperspektive.

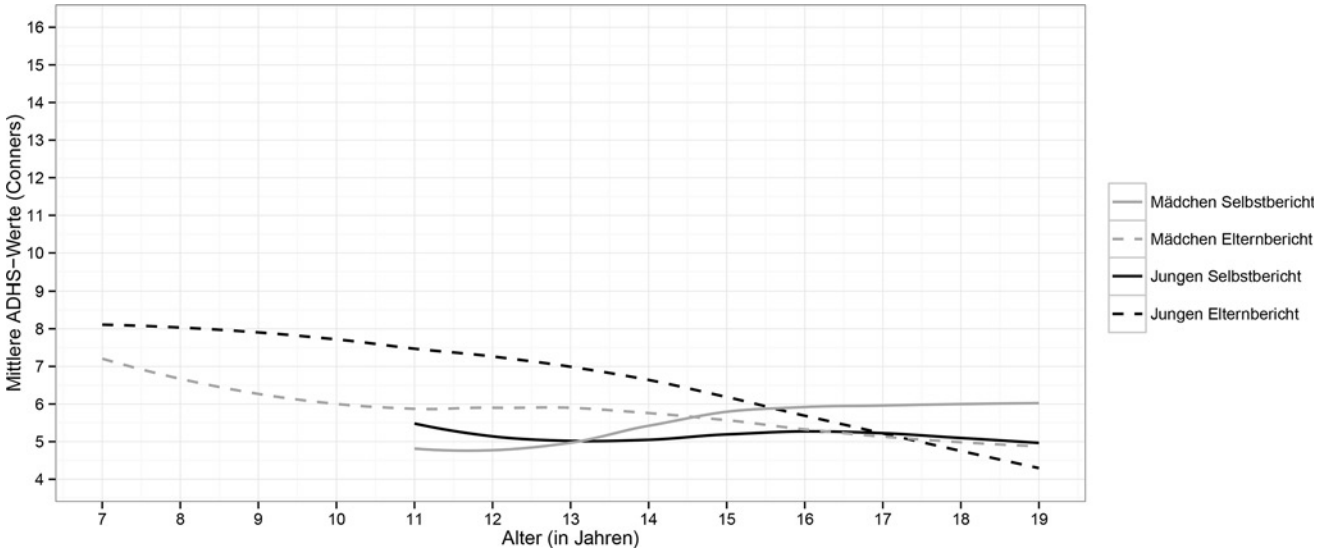


Abbildung 3. Mittlere ADHS-Symptome im Alter von 7 bis 19 Jahren nach Geschlecht und Befragungsperspektive.

stimmung mit der Literatur deutliche Unterschiede zwischen Jungen und Mädchen (Costello et al., 2011). Während Symptome von Depression und Angst bei Mädchen häufiger auftraten, zeigten sich Symptome von ADHS und Störungen des Sozialverhaltens häufiger bei Jungen. Darüber hinaus ließ sich ebenfalls in Übereinstimmung mit einem aktuellen Review von Costello et al. (2011) feststellen, dass Symptome von ADHS und Störungen des Sozialverhaltens über Kindheit und Jugend hinweg abnahmen, während internalisierende Auffälligkeiten (Depression und Angst) zunahmen.

Die Ergebnisse stützen die aus der Literatur bekannte Annahme, dass Eltern internalisierende Auffälligkeiten ihrer Kinder niedriger einschätzen als diese selbst (Holmbeck et al., 2002; Seiffge-Krenke & Kollmar, 1998). Entsprechende Symptome sollten daher in der klinischen Praxis immer auch aus der Selbstperspektive erhoben werden, in zukünftigen Studien möglichst auch schon vor dem 11. Lebensjahr.

Nur ein geringer Teil der Kinder und Jugendlichen mit klinisch signifikanten Symptomen ist in fachspezifischer Behandlung (Hintzpeter et al., 2014). Von den Kindern und Jugendlichen mit aktuellen, klinisch signifikanten Symptomen von Depression sind 13 %, mit Ängsten 11 %, mit ADHS 20 % und mit Störungen des Sozialverhaltens 14 % im letzten Jahr in psychiatrischer oder psychotherapeutischer Behandlung gewesen (Hintzpeter et al., 2014). Bei der Behandlung sollte spezifischen Symptomgruppen

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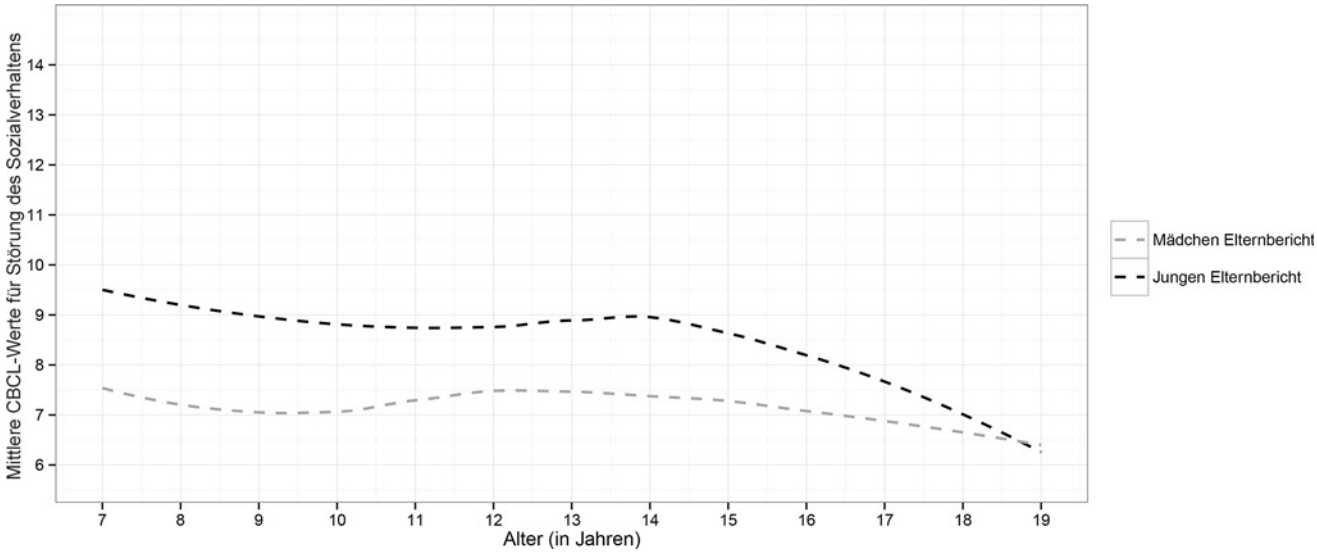


Abbildung 4. Mittlere Symptome von Störungen des Sozialverhaltens im Alter von 7 bis 19 Jahren nach Geschlecht aus Elternperspektive.

auch mit spezifischen Interventionen begegnet werden (z. B. Depression, siehe Petermann, 2012; Störungen des Sozialverhaltens siehe Petermann & Petermann, 2013). Daneben sollten auch geschlechtsspezifische Aspekte bei der Therapie berücksichtigt werden (Stadler, Euler & Schwenck, 2013).

Sutin et al. (2013) beschrieben kürzlich die Entwicklung von depressiven Symptomen im Alter von 19 bis 95 Jahren. Die Symptome wurden ebenfalls mit der CES erfasst, wodurch die Ergebnisse bezogen auf Altersspektrum und Erhebungsverfahren unmittelbar an die vorliegende Untersuchung anschließen. Depressive Symptome nehmen über das mittlere Erwachsenalter ab und im späteren Erwachsenenalter wieder zu (Sutin et al., 2013). Analysen über den Verlauf von Symptomen über die gesamte Lebensspanne für verschiedene Störungsbereiche stellen einen interessanten Gegenstand für zukünftige Studien dar.

Auch die Grenzen der vorliegenden Arbeit sollen nicht unerwähnt bleiben. Pro Teilnehmer gingen in die vorliegenden Analysen nur bis zu vier Urteile über einen Zeitraum von maximal sechs Jahren ein und nicht über das gesamte Altersspektrum. Allerdings ließ sich ein signifikanter kleiner Kohorteneffekt nur für Depression und ADHS aus der Selbstperspektive nachweisen. Der Verlauf der Symptome ist nur über die Randmittel beschrieben, daher müssen die Grafiken mit Vorsicht interpretiert werden. Es zeigten sich signifikante individuelle Unterschiede, deswegen müssen die mittleren Verläufe als grobe Annäherung verstanden werden. Es konnten keine Daten für Kinder unter 7 Jahren ausgewertet werden, so dass der Verlauf der Symptome im Vorschulalter in zukünftigen Analysen berichtet werden sollte. Künftige Studien sollten das Selbsturteil von Kindern unter 11 Jahren mit einbeziehen, da bereits jüngerer Kinder valide Urteile abgeben können. Die CBCL wurde für die Operationalisierung von Störungen des Sozialverhaltens eingesetzt, obwohl sie nach dem dimensionalen Ansatz entwickelt und für die Erfassung externalisierender Auffälligkeiten im Allgemeinen konzipiert wurde. Des Weiteren lagen Daten zu Störungen des Sozialverhaltens nur aus Elternperspektive vor.

Zu den Stärken der vorliegenden Analysen gehören die Größe der Stichprobe, die Breite der erhobenen Symptome, das große beobachtete Altersspektrum von 12 Jahren sowie die getrennten Analysen nach Geschlecht und Befragungsperspektive.

Um den Verlauf von psychischen Auffälligkeiten besser zu verstehen, beispielsweise den Anstieg oder Abfall von Symptomen in spezifischen Entwicklungsphasen, sollten zukünftige Studien auch genetische und soziale Determinanten untersucht werden. Kenntnisse über geschlechtsspezifische Risikoprofile verschiedener Symptomverläufe würden hilfreiche Ansatzpunkte für Prävention und Intervention liefern.

Schlussfolgerungen für die klinische Praxis

Die vorliegenden Ergebnisse dokumentieren die Prävalenzen für die vier häufigsten psychischen Störungen im Kindes- und Jugendalter. Es werden die aus der klinischen Praxis bekannten Urteile im Eltern- und Selbsturteil der Kinder und Jugendlichen bestätigt. Eltern nehmen inter-

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nalisierende Störungen als geringer ausgeprägt wahr als die betroffenen Kinder. Im Fremdurteil wird die ADHS dreimal häufiger eingeschätzt als im Selbsturteil. Erstmals wurde der geschlechtsspezifische Verlauf von psychischen Auffälligkeiten von Kindern und Jugendlichen in Deutschland beschrieben, was für das Angebot an klinischen Versorgungsleistungen bedeutsam ist. Außerdem stimmt die Tatsache nachdenklich, dass weniger als 20 % aller Kinder und Jugendlichen mit psychischen Auffälligkeiten professionelle Hilfe in Anspruch nehmen. Insgesamt zeigt ein substanzieller Anteil aller Kinder und Jugendlichen in jeder Entwicklungsphase klinisch bedeutsame Symptome und benötigt eine entwicklungs- und geschlechtssensitive Diagnostik und Behandlung.

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Conclusions

Publication 1 focussed on trajectories and prevalences of internalising and externalising mental health problems in children and adolescents aged 7 to 19 years. The findings of this publication firstly suggest a shift in the manifestation of mental health problems over the course of childhood and adolescence and highlights the age and gender differences within these trajectories. Moreover, these age and gender-specific differences in internalising and externalising mental health problems highlight the importance of gender-specific approaches in both research and clinical practice. Finally, the inconsistencies between self-reported and parent-reported mental health problems, especially in girls with internalising mental health problems, emphasises the relevance for and the importance of multi-informant and particular disorder-specific assessments to obtain a valid picture of the child or adolescent's mental health.

The next three publications of this thesis focus on two at risk groups for child mental health problems.

Firstly, the vulnerable group of children and adolescents of parents with mental health problems (Publication 2 and Publication 3) is investigated. As shown by the international body of literature on families with parental mental health problems and summarised in Chapter 2.6.3, these families seem to be at particular risk for cumulating – within their family – several risk factors that are known to have a negative impact on mental health. Furthermore, research has shown that in general, parental mental health negatively impacts child mental health. This thesis explores the question whether these findings are also replicable with German data (Publication 2). Resilience research and research on risk and protective factors to mental health however demonstrates that protective factors mitigate the effect of adverse environments. Publication 3 of this thesis explores potential protective factors leading to positive mental health regarding the group of children and adolescents from families with parental mental health problems.

Secondly, this thesis examines the at-risk group of adolescents with externalising mental health problems. While Publication 1 showed that externalising mental health problems affect a smaller proportion of children and adolescents compared to internalising mental health problems, the long-term consequences of the former are nevertheless significant (see Chapter 2.6.4). Publication 4 highlights how externalising problems during adolescence are associated with potentially detrimental outcomes in young adulthood.

5.2. Children of Parents with Mental Health Problems – Prevalences and Risk Constellations

Publication 2

Plass, A.*, **Haller, A-C.***, Otto, C., Barkmann, C., Wiegand-Grefe, S., Hölling, H., Schulte-Markwort, M., Ravens-Sieberer, U., & Klasen, F. (2017). Parents with mental health problems and their children in a German population-based sample: Results of the BELLA study. *PLOS ONE, 12*(7), e0180410. https://doi.org/10.1371/journal.pone.0180410

Overview

Drawing on the body of resilience research and the research on risk and protective factors, the aims of this and the next publication are to examine families and children with parents reporting mental health problems. Publication 2 investigates the risk associated with being the child or adolescent of a parent with mental health problems and to develop mental health problems themselves.

Research Questions

The research questions addressed in this publication include:

2.1 How many children and adolescents in Germany have at least one parent with mental health problems?

2.2 What is the prevalence of mental health problems in children and adolescents with parents suffering from mental health problems themselves?

2.3 What risk factors for mental health are associated with parental mental health problems?

2.4 How do parental mental health problems affect child and adolescent mental health when controlling for other risk factors?

Sample

To address these research questions, the most recent cross-sectional data at the time of publication from the BELLA study's third wave (6-year-follow-up) were analysed. For theoretical considerations and conceptual reasons, only families with biological parents were included. A total sample of N = 1158 children and adolescents aged 11 to 17 years (M = 14.8; SD = 1.76) was identified. Girls accounted for 47.2% (n = 547) of the sample. The rate of mental health problems in children and adolescents in the total sample was 9.8% (n = 113).

Results

The analyses of the sample revealed that nearly one in five children (n = 215; 18.6%) had at least one parent with mental health problems, as assessed by the SCL-S-9. Furthermore, children of parents with mental health problems were significantly more likely to report mental health problems themselves, measured by child-report of the SDQ with *borderline* and *abnormal* scores. More specifically, significantly more children and adolescents reported

mental health problems (19.1%; *n* = 41) compared with the group of children without parental mental health problems (7.7%; *n* = 72), with the risk being about three times higher for the former (*OR* = 2.85; CI [1.88 – 4.32). Further comparing children and adolescents with parental mental health problems to those without, the findings showed that almost all examined risk factors – except for the number of siblings – were significantly more prevalent in the former group. In particular, the highest risk factors present in families with parental mental health problems included stressful live events (*OR* = 3.86; CI [2.46 – 6.06), parental daily strain (*OR* = 3.11; CI [2.29 – 4.23), child and adolescent mental health problems (*OR* = 2.85; CI [1.88 – 4.32), parental unemployment (*OR* = 2.26; CI [1.64 – 4.17), parental chronic disease (*OR* = 2.53; CI [1.85 – 3.45), and single parent families (*OR* = 2.23; CI [1.53 – 3.23).

A first multiple logistic regression analyses examined the contextual risk factors associated with families with parental mental health problems. The statistically significant risk factors associated with parental mental health problems were low SES and unemployment in at least one parent. Furthermore, families who had experienced two or more recent stressful life events were significantly more likely to report parental mental health problems compared with families without parental mental health problems. Parental daily strain and parental chronic disease were the highest risk factors associated with parental mental health problems. Notably, the presence of mental health problems in the children and adolescents was also positively associated with increased levels of parental mental health problems. The proportion of variance explained in this regression model amounted to R^2 = 16.1%.

A second multiple logistic regression analysis was conducted to determine whether parental mental health problems predicted child and adolescent mental health while controlling for the contextual risk factors. The results confirmed that children and adolescents of parents with mental health problems had significantly increased risks of experiencing mental health problems themselves (*OR* = 1.74; [1.06 – 2.86]). Other significant predictors of child and adolescent mental health problems included exposure to multiple stressful life events, being female, and having younger parents. The proportion of variance explained in this regression model amounted to R^2 = 6.8%.

Publication 2

Plass, A.*, **Haller, A-C.***, Otto, C., Barkmann, C., Wiegand-Grefe, S., Hölling, H., Schulte-Markwort, M., Ravens-Sieberer, U., & Klasen, F. (2017). Parents with mental health problems and their children in a German population-based sample: Results of the BELLA study. *PLOS ONE, 12*(7), e0180410. https://doi.org/10.1371/journal.pone.0180410

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RESEARCH ARTICLE

Parents with mental health problems and their children in a German population based sample: Results of the BELLA study

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Abstract

Background

Mental health problems (MHP) of parents are associated with an increased risk of psychological and developmental difficulties in their children. This study aims at analyzing population-based data of parents with MHP and their children and the effects of associated risk factors in order to further targeted preventive and therapeutic interventions.

Methods

The BELLA study is the mental health module of the German National Health Interview and Examination Survey among Children and Adolescents. MHP in parents and in their children as well as associated risk factors were examined in a sample of $N = 1158$ parents with children aged 11 to 17 years.

Results

Parental MHP were identified in 18.6% of the sample. Risk factors associated with parental MHP were low SES, parental unemployment, stressful life events, parental daily strain, parental chronic disease, and child MHP. A rate of 19.1% of the children of parents with MHP reported MHP themselves, the corresponding rate among children of parents without MHP was 7.7%. In multiple regression analyses the risk for children of parents with MHP to report MHP themselves was almost two times higher than the risk of children of parents without MHP. Other significant associations with child MHP included gender, the parents' age, and stressful life events.

Conclusions

Parental MHP constitute a significant risk for the mental health of their children. Targeted screening methods and preventive interventions are needed.

Introduction

Children of parents with mental health problems (MHP) have an increased risk of psychological and developmental difficulties compared to children of parents without MHP [1]. In clinical child and adolescent samples, previous studies have estimated that up to half of the children who undergo treatment for psychiatric illnesses have parents who have been diagnosed with a mental disorder [2,3]. Correspondingly, results of a meta-analysis suggest that more than half of the children of parents with mental disorders will develop MHP during their childhood or adolescence [4]. Moreover, MHP of parents show a substantial association with MHP of their children in late adulthood [5]. To date, population-based data regarding the situation of the risk group of children of parents with MHP have only rarely been examined [6], impeding the devise of appropriate public health policies.

For the etiology of mental health disorders biological and genetic factors are relevant [7]. In addition, the presence of psychosocial risk factors plays an important role in the development of MHP [8]. This is of particular relevance for children of parents with a mental illness [3,9]: For one, risk factors tend to cluster together [8–10]. Second, this applies even more to families with parental MHP, where almost all sources of psychosocial stress raising the probability for MHP seem to be present.

The few existing empirical findings based on population-based data regarding children of parents with MHP demonstrate that parental MHP are a significant predictor for poor child mental health as shown in a previous work based on data of the BELLA study in children aged 11 to 17 years [3,10]. Similarly, McLaughlin and colleagues [11] demonstrated that parental psychiatric disorders are significant predictors of the lifetime onset of psychiatric disorders in their children. Moreover, the general risk for children to develop any psychiatric disorder was shown to be 1.8 to 2.9 times higher compared with the total population if one parent was affected, rising to a risk of 2.2 to 4.6 times higher if both parents are affected [11].

Risk factors for the development of MHP in general include sociodemographic factors such as female gender, low socioeconomic status, [12,13], or unemployment [14]. Other risk factors for MHP are stressful live events (e.g., death of a close person or separation from a partner) [15], high strain in day-to-day life (e.g., tending a family member in need of care, problems related to work-life balance) [16], difficult family constellations (e.g., single parent, overcrowding of living quarters) [13,17], and physical health problems or chronic diseases [18]. For parents in particular, research has shown that the presence of MHP in their children add to the parent's perceived burden [2,19].

The body of literature focusing on risk factors for child MHP is very similar. Along with child female gender, the family's low socioeconomic status, parental unemployment [6,20], stressful live events, [10,21], parental strain in day-to-day life [10], difficult family constellations [6,22] have been associated with child MHP. Furthermore, parental chronic health problems [10,23] have also been shown to be significant risk factors for the development of child MHP.

The 12-months prevalence in Germany for adult mental disorders has been estimated to be 27.8% [12]. Data from the most current German micro census [24] estimates that 8.1 million families with approximately 13 million minor children lived in Germany in 2014. That is, potentially about 3.6 million children may live with a parent with a mental disorder. However, specific data concerning this risk group is lacking to date. Studies have shown that between a third and more than half of child mental health problems persist into adulthood [25,26]. Moreover, MHP heavily impact the individual's life on the short- and long-term [27], as well as the family and the social environment [20]. Furthermore, MHP yield longstanding costs to society [27,28] and are responsible for an important percentage of the overall burden of disease [29].

Consequently, there is an urgent need for the design and implementation of targeted prevention and treatment strategies specifically designed for the risk group of children of parents with MHP; especially since studies have shown that the risk for MHP of children of parents with mental illnesses can effectively be reduced by 40% through preventive interventions [4]. Early intervention programs for children and adolescents moreover showed very good cost-benefit ratios and were qualified to be worth financing [30]. Thus, not only do preventive interventions for families with parents with MHP effectively reduce the risk for psychiatric morbidity in their children, they also show a good cost-effectiveness.

This study therefore set out with the main aim to examine the group of children of parents with MHP in a population-based sample in order to gain a better overview and deeper understanding of this particular risk group in Germany and the psychosocial risk factors associated with it. More precisely, we will 1) report how many children in Germany have at least one parent with MHP, 2) report the prevalence of children of parents with MHP that suffer from MHP themselves, 3) examine the effect of risk factors for mental health in parents, and 4) examine the effect of parental MHP on child mental health when controlling for other risk factors. Based on the body of literature, we expect risk factors for mental health (e.g., unemployment, chronic disease) to negatively affect parental mental health. We furthermore expect parental MHP to be one of the most important risk factors for child MHP.

Methods

Study design

Analyses for the present study were conducted using data from the 3rd wave (2009 to 2012) of the Behaviour and Wellbeing of Children and Adolescents in Germany – the BELLA study. The BELLA study is the mental health module of the National Health Interview and Examination Survey for Children and Adolescents (KIGGS) in Germany and has been conducted in regular time intervals since 2003. KiGGS is a German representative survey that collects data on the health status of German children and adolescents from 0 to 17 years of age and into adulthood. A detailed description of the KiGGS sample, design, and methods has been published by Kamtsiuris, Lange, and Schaffrath [31]. The BELLA study wave 3 took part from 2009 until 2012 and collected data on mental health, risk and protective factors, health care, and sociodemographic data, using standardized and internationally tested instruments, if available. For further details regarding the design and methods of the BELLA study see [32] and [26].

Measures

Parental MHP were measured using the German translation of the Symptom-Checklist Short version (SCL-S-9), a short form of the Symptom-Checklist-90-R [33,34]. The SCL-S-9 is a frequently applied screening instrument that assesses various MHP in adults. The nine items representing the dimensions somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, anger-hostility, phobic anxiety, paranoid ideation, and psychoticism were rated on a five-point scale ranging from 0 = *none at all* to 4 = *very severe*. We adapted the SCL-S-9 total score to the Global Severity Index of the SCL-90-R (GSI), which is the sum score over all 90 items of the SCL-90-R, and used the recommended gender-specific cutoff for the GSI (T-values $\geq$ 63) to identify parents with MHP [35].

Child MHP were identified by means of the child-reported Strengths and Difficulties Questionnaire (SDQ) [36], one of the most frequently used screening tools for psychological problems [37] in young people. The 20 items of the four problem scales (emotional problems, conduct problems, hyperactivity/inattention, peer relationship problems) were rated on a

three-point-scale with 0 = *not true*, 1 = *somewhat true*, and 2 = *certainly true*. All items were summed up to generate the Total Difficulties score, with higher values indicating more severe problems. Following the normalized cut-off values by Meltzer and colleagues [23] we classified the Total Difficulties score into *normal*, *borderline*, and *abnormal* scores. The corresponding categorical variable was subsequently dichotomized with one group including only children and adolescents with *normal* scores and the second group including those with *borderline* and *abnormal* scores indicating MHP.

Sociodemographic factors, stressful life events, parental daily strain, family constellation, and parental chronic disease were assessed in addition to parental and child MHP. Parents reported on parental age, the socioeconomic status of the family (SES), unemployment, stressful life events, as well as on the family constellation, parental daily strain, and parental chronic disease.

Parental age was measured by asking the parent filling in the questionnaire to report on both the mother's and the father's age. The data were dichotomized into two groups consisting of mothers aged up to 44 years, and 45 years of age and older, and of fathers aged up to 49 years and 50 years of age and older, respectively.

The SES was measured using the Winkler-Index [38]. This score ranging from 3 to 21 points was computed using data on parental education, occupation, and household income. We used the metric variable for the multivariate analyses. For descriptive purposes and bivariate analyses, three groups were created based on the metric SES score differentiating those with low (3 to 8 points), medium (9–14 points), and high SES (15 to 21 points) [39].

Unemployment was assessed by an item enquiring about whether one or both of the parents are currently unemployed or not.

Four specific stressful live events were assessed by means of an index computed with four dichotomous items using both parent- and child-reported data. Children reported if a close person had died and if parents had separated or divorced within the last twelve months. The other two stressful live events included financial stress (reported by parents for children younger than 13 years and reported by children/adolescents themselves if aged 13 years or older) and an accident or severe illness happening to the child/adolescent (self-reported).

Parental daily strain was identified using an index made of 13 items enquiring about the burden caused by e.g., housekeeping, conflicts with the partner, parenting, tending a family member in need of care, job-related problems, or work-life balance in general. The response options for the items included in the index parental daily strain ranged from *not at all* to *very* strong. The created variable on parental daily strain was subsequently dichotomized with response options *strong* and *very strong* indicating high parental daily strain.

Difficult family constellation was measured using two dichotomous items assessing whether the parent was a single parent and whether the child or adolescent had three or more siblings.

Finally, the answer to whether either one or both parents suffer from a *chronic disease* was obtained through two items enquiring whether the parent filling in the questionnaire or the partner was suffering from a chronic disease or a disability (e.g., asthma, diabetes, rheumatism). The two items were subsequently integrated into one variable indicating chronic disease or disability in one or both parents.

Statistical analysis

First analyses included frequencies, Odds Ratios, confidence intervals, χ^2 tests and other tests of significance. The group of parents with MPH was compared to the group of parents without MHP with χ^2 tests and Odds Ratio being calculated for all risk factors. In order to assess the association of all risk factors with parental MHP and the association of parental MHP with

child MPH while simultaneously controlling for all other risk factors we conducted multiple logistic regression analyses.

Descriptive analyses were computed using weighted data. The weight was calculated based on data from the German microcensus with regard to the children's age and gender, and the families' SES. All statistical analyses were conducted using the software package IBM SPSS Version 22.0 [40].

Results

Sample

These present analyses rely on a subsample of $N = 1158$ families with children and adolescents aged 11 to 17 years, of which 47.2% ($n = 547$) were female. The mean age of the children and adolescents was 14.8 ($SD = 1.76$). The SES was distributed as follows: 16.0% ($n = 185$) of the families had a low, 65.5% ($n = 758$) a medium SES, and 18.5% ($n = 215$) of the families had a high SES. Only families with biological parents were included in our analyses. The prevalence of child MHP in the total sample was 9.8% ($n = 113$). In children of parents with MHP ($n = 215$), the mean age was 14.82 years, ($SD = 1.89$), and 47.9% ($n = 103$) were female. In children of parents without MHP (n = 943), the mean age was 14.77 ($SD = 1.75$), and 47.1% ($n = 444$) were female.

Families with parental MHP compared with families without parental MHP

Parental MHP were identified in 18.6% ($n = 215$) of the total sample. The four most frequent MHP reported by the parents were depressive symptoms (22.6%, $n = 262$), interpersonal sensitivity (15.4%, $n = 178$), somatization (12.1%, $n = 140$), and obsessive-compulsive (11.2%, $n = 130$) (multiple answers possible).

Families with parental MHP are compared with families without MHP in Table 1. In families with parental MHP low SES was reported significantly more often and parents were significantly younger than in families without parental MHP. Parents with MHP also significantly more often were unemployed, showed higher parental daily strain, and reported two or more stressful life events. They were furthermore significantly more often single parents and significantly more often reported chronic diseases in one or both parents compared with parents without MHP. No difference between the two groups was found regarding the number of siblings in the family.

Children of parents with MHP compared with children of parents without MHP

Significantly more children of parents with MHP reported MHP themselves (19.1%, $n = 41$) compared with 7.7% ($n = 72$) of children from parents without MHP: the risk for child MHP was about three times higher for children of parents with MHP compared to children of parents without MHP ($OR = 2.85$; CI [1.88 – 4.32]). Children of parents with MHP significantly more often reported having experienced two or more stressful life events compared with children of parents without MHP. More specifically, with respect to stressful life events, 15.8% ($n = 34$) of the children of parents with MHP experienced the death of a close person compared with 11.7% ($n = 110$); $\chi^2(1) = 2.768$, $p = .096$) of children of parents without MHP. Further, 12.8% ($n = 28$) of the children of parents with MHP experienced the divorce or separation of their parents compared with 4.2% ($n = 40$; $\chi^2(1) = 24.426$, $p = .001$) of children of parents without MHP. Moreover, 16.2% ($n = 35$) of the children of parents with MHP suffered

Table 1. Families with and without parental MHP and their children.

	Families with parental MHP *n* = 215 (18.6%)		Families without parental MHP *n* = 943 (81.4%)			
	n	**(%)**	***n***	**(%)**	***OR***	**CI**
Child MHP	41	(19.1)	72	(7.7)	2.85***	[1.88–4.32]
SES						
Low	60	(27.9)	125	(13.3)		
Medium	129	(60.0)	629	(66.6)	0.43***[a]	[0.30–0.61]
High	26	(12.1)	189	(20.1)	0.29***[b]	[0.17–0.48]
Age mother (< 45 yrs old)	145	(67.5)	505	(53.6)	0.56***	[0.41–0.76]
Age father (< 50 yrs old)	172	(80.2)	684	(72.5)	0.66*	[0.46–0.95]
Risk Factors for MHP						
Parental unemployment	31	(14.4)	57	(6.1)	2.62***	[1.64–4.17]
Two stressful life events or more	38	(17.9)	50	(5.3)	3.86***	[2.46–6.06]
Parental daily strain	106	(49.5)	226	(24.0)	3.11***	[2.29–4.23]
Single parent family	50	(23.1)	113	(12.0)	2.23***	[1.53–3.23]
Three siblings or more	15	(7.0)	41	(4.4)	1.64	[0.90–3.04]
Parental chronic disease	89	(41.3)	206	(21.9)	2.53***	[1.85–3.45]

Note. Weighted data; $N = 1158$

SES = Socioeconomic status

[a] = medium SES versus low SES

[b] = high SES versus low SES

OR = Odds Ratio; CI = Confidence Interval

*$p \leq .05$.

**; $p \leq .01$.

***; $p < .001$.

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of a severe illness or an accident and 18.2% ($n = 39$) reported financial difficulties compared with 10.5% ($n = 99$; $\chi^2(1) = 5.718$, $p = .017$) and 3.9% ($n = 36$; $\chi^2(1) = 59.196$, $p = .001$) of the children of parents without MHP. No differences between children of parents with or without MHP were found regarding child age and gender.

Risk factors for parental MHP

The multivariate analysis (Table 2) revealed that of all investigated risk factors for parental MHP, the SES, parental unemployment, stressful life events, parental daily strain, parental chronic disease, and child MHP were significantly associated with parental MHP. Parental daily strain and parental chronic disease constituted the highest risks for parental MHP. The parents' age, being a single parent family, and the existence of three or more siblings in the family were not significantly associated with parental MPH.

Risk factors for child mental health and the effect of parental MHP on child mental health

Table 3 shows the effect of parental MHP on the children's mental health controlling for all other risk factors. The multivariate analysis revealed that female gender of the child as well as the mother's older and the father's younger age were significantly associated with child MHP. Moreover, having experienced two or more stressful life events and parental MHP were both

Table 2. Risk factors for parental MHP.

Risk Factors		*n*	Rates of Parental MHP [a] *n* (%)	*OR*	95% CI
Age mother	< 45 yrs old	650	145 (22.3)	0.86	[0.59–1.25]
	≥ 45 yrs old	508	70 (13.8)		
Age father	< 50 yrs old	856	172 (20.1)	1.01	[0.66–1.53]
	≥ 50 yrs old	302	43 (14.2)		
SES	Low	185	60 (32.4)	0.92**	[0.88–0.97]
	Medium	757	129 (17.0)		
	High	215	26 (12.1)		
Parental unemployment	No	1070	184 (17.2)	1.79*	[1.03–3.09]
	Yes	88	31 (35.2)		
Two stressful life events or more	< two SLE	1069	176 (16.5)	2.01*	[1.17–3.46]
	≥ two SLE	88	38 (43.2)		
Single parent family	No	995	165 (16.6)	1.35	[0.87–2.10]
	Yes	163	50 (30.7)		
Three siblings or more	< three siblings	1101	200 (18.2)	1.47	[0.78–2.76]
	≥ three siblings	56	15 (26.8)		
Parental daily strain	No	825	108 (13.1)	3.08***	[2.21–4.30]
	Yes	332	106 (31.9)		
Parental chronic disease	No	863	126 (14.6)	2.16***	[1.54–3.04]
	Yes	295	89 (30.2)		
Child mental health problems	No	1044	174 (16.7)	1.72*	[1.04–0.84]
	Yes	113	41 (36.3)		

Note. $N = 1164$

[a] = Weighted data; *OR* = Adjusted Odds Ratio; CI = Confidence Interval

SES = Socioeconomic status; SLE = Stressful life events

*$p \leq .05$.

**$p \leq .01$.

***$p < .001$, Model fit: $\chi^2(10) = 117.67$, $p < .001$; Nagelkerke $R^2 = 0.161$.

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significantly associated with child MHP. No associations were found between child age, SES, parental unemployment, parental daily strain, being a single parent family, having three siblings or more, and parental chronic disease.

Discussion

This study presents population-based data on families with parental MHP and their children, stemming from the nationally representative BELLA study. About 19% of the parents in the total sample reported MHP. Children of parents with MHP reported MHP in about 19% compared with about 8% in children of parents without MHP (*OR* = 2.85). In multivariate analysis the risk for MHP in children of parents with MHP was nearly two times higher (*OR* = 1.72) compared to children of parents without MHP.

The prevalence for parental MHP in our study was lower than in former epidemiological studies. The 12-months-prevalence of adult mental disorders reported by Jacobi and colleagues [41] in Germany for example was almost 28%. This discrepancy could be attributed to the fact that we assessed MHP in parents during the past seven days only as provided by the SCL-S-9. The most frequent parental MHP in the present study were depressive symptoms (22.6%) and interpersonal sensitivity (15.4%), followed by somatization, and obsessive-compulsive

Table 3. Risk factors for child MHP.

Risk Factors		*n*	Rates of Child MHP [a] *n* (%)	*OR*	95% CI
Gender child	Male	611	47 (7.7)	1.63*	[1.07–2.47]
	Female	547	67 (12.2)		
Age child	< mean age	489	61 (12.5)	0.92	[0.82–1.04]
	≥ mean age	668	52 (7.8)		
Age mother	< 45 yrs old	650	67 (10.3)	1.67*	[1.06–2.64]
	≥ 45 yrs old	507	46 (9.1)		
Age father	< 50 yrs old	856	92 (10.7)	0.48*	[0.27–0.84]
	≥ 50 yrs old	301	21 (7.0)		
SES	Low	186	26 (14.0)	0.95	[0.89–1.01]
	Medium	757	71 (9.4)		
	High	215	17 (7.9)		
Parental unemployment	No	1069	102 (9.5)	0.65	[0.28–1.52]
	Yes	88	11 (12.5)		
Two stressful life events or more	< two SLE	1069	91 (8.5)	2.38**	[1.27–4.46]
	≥ two SLE	89	23 (25.8)		
Single parent family	No	995	88 (8.8)	1.55	[0.88–2.71]
	Yes	162	25 (15.4)		
Three siblings or more	< three siblings	1101	107 (9.7)	1.46	[0.66–3.22]
	≥ three siblings	56	6 (10.7)		
Parental daily strain	No	826	89 (10.8)	0.81	[0.51–1.30]
	Yes	114	25 (7.5)		
Parental chronic disease	No	836	70 (8.1)	1.18	[0.75–1.87]
	Yes	294	43 (14.6)		
Parental mental health problems	No	942	72 (7.6)	1.74*	[1.06–2.86]
	Yes	215	41 (19.1)		

Note. $N = 1164$

[a] = Weighted data; *OR* = Adjusted Odds Ratio; CI = Confidence Interval

SES = Socioeconomic status; SLE = Stressful life events

*$p \leq .05$.

**$p \leq .01$; Model fit: $\chi^2(12) = 37.087$, $p < .001$; Nagelkerke $R^2 = .068$.

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symptoms (about 12% and 11%, respectively). These results are only to some extent in line with the most frequent adult mental health disorders by Jacobi and colleagues [41], who reported anxiety disorders in about 16% of the sample, followed by mood disorders in almost 10% of the cases, and obsessive-compulsive symptoms and somatization in 3.6% and 3.5% of the cases, respectively. By comparison, symptoms of anxiety among parents in our study were observed in 10.3% ($n = 120$) of the cases. But again, the instruments used to assess MHP differ considerably across both studies.

The prevalence of self-reported child MHP in the total sample was 9.8%. Again, this prevalence of MHP in children and adolescents is smaller than in other epidemiological studies, e.g. as reported by Barkmann and Schulte-Markwort [42] in their meta-analysis where the prevalence based on 33 German epidemiological studies was 17.6% for MHP in children and adolescents. Consistent with our results, the rates of child MHP at the BELLA study's baseline assessment in children aged 11 to 17 years was 12.2% [22]. Again, the varying results for prevalence of MHP in children and adolescents in Germany have to be attributed to different measures and their respective time frames.

A rate of about 20% of the children of parents with MHP reported MHP. This percentage is remarkably lower than in studies that investigated children of parents with MHP in clinical samples, where about 50% of the offspring had MHP themselves [43,44]. Other epidemiological studies also report higher rates of MHP in the offspring of parents with MHP [11]. However, in the present study, children´s MHP were assessed using the children´s self-report, leading to lower rates of MHP compared with parent-reported MHP in the children (which were also surveyed but not presented). This bias is caused by the choice of the perspective and is a well-established phenomenon in psychosocial research [45]. We nevertheless decided to use the children´s self-reports in order to exclude potential bias due to parental symptomatology: Previous studies have shown that parents with MHP report on their children´s MHP heterogeneously [46,47]. Future studies may wish to investigate in more detail the effect of different perspectives on the prevalence of child MHP especially in children of parents with MHP. In line with previous epidemiological studies [11] we furthermore found that children of parents with MHP significantly more often reported MHP (19.1%) compared with children of parents without MHP (7.7%). This result is in line with the findings of Mc Laughlin and colleagues [48].

In our multivariate analysis on risk factors for parental MHP low SES, parental unemployment, stressful life events, parental daily strain, parental chronic disease, and child MHP were associated with parental MHP. Our results, stemming from an epidemiological sample, indicate that especially in families with parental MHP risk factors for MHP cluster together [10]. Therefore, these families represent a particular risk group for developing MHP. Moreover, our findings confirm the body of literature on risk factors for adult MHP and as established by previous studies [2,12–14,18,19].

Controlling for potential risk factors, our multivariate analysis on risk factors for child MHP demonstrated that the risk for children of parents with MHP to show MHP was still almost two times higher (*OR* = 1.74) than for children of parents without MHP. The model moreover revealed that female gender of the child, the age of the mother and the father, and having experienced two or more stressful life events were significantly associated with child MHP. A previous population based study on 13 to 17 year old adolescents by McLaughlin and colleagues also demonstrated that stressful life events were associated with a substantial proportion of child MHP [49]. We did not expect parental age to be associated with child MHP as we did not include very young or very old parents. As to our knowledge no previous studies have found similar results, the association of parental age and child MHP should be investigated in future research. Overall, our results on data of a population-based sample largely replicate former studies using clinical samples, which established that children of parents with MHP are a risk group for developing MHP [4,11].

Yet, the proportion of variance explained by our model was rather small. A-posteriori models using metric variables for the outcome as well as for predictors (if available) did not yield a higher proportion of explained variance. We also need to point out that this study's purpose was to analyze risk factors only and therefore did not include protective factors such as personal, familial, or social resources. Yet, especially in adolescence, factors found outside the family such as the peer group or factors associated with school increase in importance, as explained by the literature published by developmental psychology for instance. We already published data on the effects of protective factors on children of parents with MHP aged 13 to 17 years: These analyses revealed that resources found outside of the family, such as personal and social resources (e.g., self-efficacy, school climate) contributed to the resiliency of children of parents with MHP [50].

Our findings indicate that the investigated risk factors for MHP do not have the same effects on parental mental health compared with the effects they have on child mental health.

The majority of the investigated risk factors in the multivariate analyses on parental MHP were significantly associated with parental mental health. On the other hand, our regression analysis on child MHP revealed that the risk factors associated with child mental health were child female gender, parental age, stressful life events, and parental MHP only. These results firstly confirm the premise that adverse factors are more frequent in families with a parent suffering from MHP. They however also suggest that parental mental health has a greater influence on their child's mental health compared to other potential risk factors, with the exception of stressful life events. This underlines the relevance of the parent-child relationship with respect to the mental health of the child, as outlined by Mattejat and Remschmidt and demonstrated by Beardslee and colleagues [3,51] by means of a preventive intervention focusing on the increased understanding between the child and the parent. The transmission of parental psychopathology to child MHP can partly be explained by maladaptive parent-child interaction patterns as demonstrated by van der Pol and colleagues [52]. Genetic aspects may also partly explain these results [7].

Strengths and limitations

This study has a number of limitations: First, as it refers to cross-sectional data, the results do not allow us to draw causal conclusions. For instance, child MHP may have contributed to parental MHP, and vice versa, by means of self-reinforcing processes [19]. Studies using longitudinal designs would be able to disentangle this reciprocal association. Second, we were able to investigate only a certain number of risk factors, with the operationalization of certain risk factors not always being ideal, due to the design of the BELLA study. Future research should include further relevant risk factors for child MHP and use standardized scales throughout to assess the risk factors. Third, we were able to gather data on parental MHP by one parent only. Future studies should include data on parental mental health stemming from both parents.

However this study has also several strengths: First, whereas previous studies on children of parents with MHP were solely based on clinical samples–which are not representative for the whole of the population [19,53]–we have for the first time in Germany provided information on children of parents with MHP using a community sample. Second, previous studies mostly used clinical diagnoses of the parents to assess their mental health, whereas in the present study the SCL-S-9, a widely used screening tool for adult MHP, was applied. This could be deemed a limitation as clinical diagnoses are often referred to as the gold standard. However, with regard to early intervention and prevention programs, the screening tools that were used in the present study contribute to making the results more generalizable and the presented effects even more compelling. Third, we assessed child MHP by means of self-report in order to avoid a potential bias caused by parental MHP on the evaluation of child MHP [47]. However, using multiple perspectives always contributes to a better understanding of the data [54]. Future research should therefore include parent and teacher perspectives on child MHP.

Conclusion

In Germany, almost 20% of the 11- to 17-year old children live with a parent with MHP. The risk for these children to report MHP themselves is nearly 2 times higher compared with children of parents without MHP. Furthermore, other investigated risk factors for child MHP such as parental daily strain, single parent family, or parental chronic disease do not seem to affect child mental health as much as parental MHP, with the exception of stressful live events. Families with parental MHP therefore represent a particular risk group for child MHP. Currently, different prevention and intervention programs for families with parental MHP are being developed and implemented in clinical settings for patients either in adult psychiatry or

child and adolescent psychiatry. These programs show good effectiveness in reducing psychopathology and risk factors. [51,55,56]. The epidemiological data of the present study provides evidence that not only in clinical settings but also in the general population families with parental MHP show an increased risk for MHP. Consequently, our results should provide a basis for public health policy to identify families with MHP in the general population, to adapt clinical programs of prevention and intervention to the needs of these families, and to offer intervention and prevention programs in public health settings to families with parental MHP.

Supporting information

S1 File. Dataset.
(XLS)

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Conclusions

Publication 2 focussed on the risk constellation of families with parental mental health problems and the risk of their offspring to report mental health problems themselves. Nearly one fifth of the investigated families reported parental mental health problems. Child and adolescent mental health problems were significantly more present in these families compared with families without parental mental health problems. Furthermore, the results underscore the concept of cumulative risks – as discussed in Chapters 2.6.2 and 2.6.3 – as families with parental mental health problems reported significantly higher risk constellations than families without parental mental health problems. Moreover, the risk of children and adolescents in these families experiencing mental health problems when accounting for the effect of the other risks factors was still nearly twice as high compared to those from families without parental mental health problems. Furthermore, the same risk factors appear to affect parental mental health problems and child and adolescent mental health problems differently: of all investigated risk factors, stressful life events, parental mental health problems, child female gender, parental age (in that order) were associated with child and adolescent mental health problems. In summary, while parental mental health problems represent a key risk factor for child and adolescent mental health problems, the impact is embedded within a broader constellation of co-occurring risks in these families.

Based on resilience research and the body of literature on risk and protective factors of child and adolescent mental health – also within the context of parental mental health problems (see Chapters 2.2.2, 2.6.2, and 2.6.3) – the aim of the next publication (Publication 3) is to investigate these families further by exploring potential protective factors and their impact on child and adolescent mental problems and HRQoL.

5.3. Children of Parents with Mental Health Problems – Protective Factors

Publication 3

Plass, A.*, **Haller, A-C.***, Habermann, K., Barkmann, C., Petermann, F., Schipper, M., Wiegand-Grefe, S., Hölling, H., Ravens-Sieberer, U., & Klasen, F. (2016). Faktoren der Gesunderhaltung bei Kindern psychisch belasteter Eltern: Ergebnisse der BELLA-Kohortenstudie [Factors promoting mental health in children of parents with mental health problems: Results of the BELLA cohort study]. *Kindheit und Entwicklung, 25*(1), 41–49.

Overview

Building on the previous publication, this publication explores protective factors promoting good mental health and HRQoL in the group of children and adolescents with parents with mental health problems. For that purpose and based on the body of literature of resilience research and research on risk and protective factors, several protective factors were selected. These included self-reported personal (self-efficacy, optimism, social competence), familial (family climate, parental support), and social factors (social support, school climate).

Research Questions

3.1 What protective factors are associated with good mental health in children and adolescents of parents with mental health problems?

3.2 What protective factors are associated with HRQoL in children and adolescents of parents with mental health problems?

Sample

To address these research questions, the most recent cross-sectional data at the time of publication from the BELLA study's third wave (6-year-follow-up) were analysed. For theoretical considerations and conceptual reasons, only families with biological parents were included. A total sample of N = 165 families with parental mental health problems was identified, with children aged 13 to 17 years (M = 15.9; SD = 1.43) and where n = 88 (53.3%) were female[21].

Results

A multiple logistic regression analyses revealed that social competence, parental support, and school climate were significantly associated with good mental health in children and adolescents. A second multiple logistic regression analysis revealed that predictors of positive HRQoL however included self-efficacy, optimism, family climate, and school climate. The

[21] The sample size of Publication 3 differs from the sample size of Publication 2, as self-reported protective factors in the BELLA sample were only collected from 13 years on.

proportion of variance explained amounted to R^2 = 33.3% in the first regression model, and R^2 = 47.3% in the second regression model.

Publication 3

Plass, A.*, **Haller, A-C.***, Habermann, K., Barkmann, C., Petermann, F., Schipper, M., Wiegand-Grefe, S., Hölling, H., Ravens-Sieberer, U., & Klasen, F. (2016). Faktoren der Gesunderhaltung bei Kindern psychisch belasteter Eltern: Ergebnisse der BELLA-Kohortenstudie [Factors promoting mental health in children of parents with mental health problems: Results of the BELLA cohort study]. *Kindheit und Entwicklung, 25*(1), 41–49.

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Studie

Faktoren der Gesunderhaltung bei Kindern psychisch belasteter Eltern

Ergebnisse der BELLA-Kohortenstudie

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Zusammenfassung. Kinder psychisch belasteter Eltern bilden eine Hochrisikogruppe für die Entwicklung psychischer Auffälligkeiten und weisen im Vergleich zur Gesamtbevölkerung eine geringere gesundheitsbezogene Lebensqualität auf. Für die Entwicklung spezifischer präventiver und therapeutischer Unterstützungsprogramme wurden veränderungssensitive Faktoren der psychischen Gesunderhaltung in einer Stichprobe von psychisch belasteten Eltern und ihren 13- bis 17-jährigen Kindern untersucht. Es wurden signifikante Prädiktoren aus den drei Bereichen personale, familiäre und soziale Ressourcen sowohl für die psychische Gesundheit als auch für die gesundheitsbezogene Lebensqualität identifiziert. Für psychische Gesundheit waren dies soziale Kompetenz, familiäre Unterstützung und Schulklima, für Lebensqualität Selbstwirksamkeitserwartung, Optimismus, Familienklima und Schulklima. Die Ergebnisse machen deutlich, dass personale, familiäre und soziale Ressourcen für Kinder psychisch belasteter Eltern von großer Bedeutung sind für die psychische Gesunderhaltung. Sie profitieren insbesondere von Ressourcen, die außerhalb der Familie angesiedelt sind, wie einer guten schulischen Integration. Spezifische Interventionsprogramme für Kinder psychisch belasteter Eltern sollten neben der persönlichen und familiären deshalb unbedingt auch die schulische Situation berücksichtigen.

Schlüsselwörter: psychisch belastete Eltern, psychische Gesundheit, gesundheitsbezogene Lebensqualität, Ressourcen, Faktoren der Gesunderhaltung

Factors Promoting Mental Health in Children of Parents With Mental Health Problems: Results of the BELLA Cohort Study

Abstract. Mental health problems in parents represent a well-established risk factor for a wide variety of maladaptive cognitive, psychosocial, and behavioral outcomes in their children. More than half of these children develop psychiatric disorders in childhood or adolescence constituting a risk for psychiatric disorders being two to three times higher than in the total population. Furthermore, children of parents with mental health problems rate their health-related quality of life significantly worse than do children from the general population. However, not all children exposed to parental mental health problems develop psychiatric disorders later in life, and some of these children function better than expected, given the level of exposure to risk factors they have experienced. Recent findings suggest that personal resources such as the cognitive and social capabilities of the youth, as well as positive family relationships and social support, act as protective factors for children of parents with mental health problems. In order to develop specific support programs for this high-risk group, protective factors, especially those that can be influenced by therapeutic or preventive interventions, should be studied in greater detail. The aim of the present study therefore was to identify factors associated with good mental health and good health-related quality of life in children of parents with mental health problems. We examined the data of N = 165 parents with mental health problems and their children aged 13 – 17 years from the fourth measurement point of the BELLA study (the mental health module of the German National Health Interview and Examination Survey for children and adolescents). Parental mental health problems were measured using the SCL-K 9, children's mental health and health-related quality of life were measured using the SDQ and the KIDSCREEN-10, respectively. Furthermore, personal resources (self-efficacy, optimism, social competence), familial resources (family climate, parental support), and social resources

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Die Mitglieder der BELLA studygroup sind: Ulrike Ravens-Sieberer und Fionna Klasen, Hamburg (Projektleiterinnen); Claus Barkmann, Hamburg; Monika Bullinger, Hamburg; Manfred Döpfner, Köln; Beate Herpertz-Dahlmann, Aachen; Heike Hölling, Berlin; Franz Petermann, Bremen; Franz Resch, Heidelberg; Aribert Rothenberger, Göttingen; Sylvia Schneider, Bochum; Michael Schulte-Markwort, Hamburg; Robert Schlack, Berlin; Frank Verhulst, Rotterdam; Hans-Ulrich Wittchen, Dresden.

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(social support, school climate) were assessed. All data were self-reported. Multiple linear regressions demonstrated that a combination of personal, familial, and social resources predicted both good mental health and health-related quality of life. More specifically, good mental health of the children was predicted by social competence, parental support, and school climate. Good health-related quality of life was predicted by self-efficacy, optimism, family climate, and school climate. The combination of personal, familial, and social resources positively influences the mental health and health-related quality of life of children with parents with mental health problems. School climate proved to be an important factor promoting both mental health and health-related quality of life. This finding supports the hypothesis that particularly resources outside of the family are important for children of parents with mental health problems. These results provide valuable information for preventive and therapeutic interventions for children of parents with mental health problems.

Keywords: parents with mental health problems, mental health, health-related quality of life, resources, protective factors

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Psychische Erkrankungen von Eltern sind bei ihren Kindern mit einem erhöhten Risiko für psychische Auffälligkeiten und Schwierigkeiten in der Entwicklung verbunden. Mehr als die Hälfte der Kinder mit psychisch kranken Eltern entwickeln ihrerseits psychische Störungen in der Kindheit oder Adoleszenz (Siegenthaler, Munder & Egger, 2012). Gegenüber der Gesamtbevölkerung entspricht dies einem etwa doppelt so hohen Risiko für psychische Erkrankungen (Barkmann & Schulte-Markwort, 2012; Hölling et al., 2014). Eine große epidemiologische Studie (McLaughlin et al., 2012), die sich auf WHO-Daten stützt, weist für Kinder mit einem psychisch erkrankten Elternteil ein 1.8- bis 2.9-fach erhöhtes Risiko gegenüber der Gesamtbevölkerung nach, selbst eine psychische Erkrankung zu entwickeln; bei zwei erkrankten Elternteilen ist das Risiko um das 2.2- bis 4.6-fache erhöht.

Auch die gesundheitsbezogene Lebensqualität, die als multidimensionales Konstrukt körperliche, emotionale, mentale, soziale und verhaltensbezogene Aspekte des Wohlbefindens und der Funktionsfähigkeit erfasst (Ravens-Sieberer et al., 2014), wird bei Kindern psychisch kranker Eltern gegenüber Referenzstichproben deutlich schlechter eingeschätzt (Jeske, Bullinger & Wiegand-Grefe, 2011).

Trotz dieses deutlich erhöhten Risikos entwickeln nicht alle Kinder psychisch kranker Eltern psychische Auffälligkeiten und einige weisen sogar ein sehr gutes Funktionsniveau und eine hohe Lebensqualität auf (Brennan, Le Brocque & Hammen, 2003; Lewandowski et al., 2014; Rutter, 1985). Welche protektiven Faktoren in Gegenwart eines hohen Risikos eine gesunde psychische Entwicklung vorhersagen (Masten, Cutuli, Herbers & Reed, 2009) ist Gegenstand von längsschnittlichen Studien, die Merkmale des Kindes (personale Faktoren), der Familie (familiäre Faktoren) und des sozialen Umfeldes (soziale Faktoren) identifizieren (Werner, 1989).

Personale Faktoren als Eigenschaften des Kindes wie eine gute Selbstwirksamkeitserwartung, Optimismus und gute soziale Kompetenz sind in Risikogruppen von Kindern depressiver Eltern mit einer gesunden psychischen Entwicklung der Kinder verbunden (Lewandowski et al., 2014; Pargas, Brennan, Hammen & Le Brocque, 2010). Während Selbstwirksamkeitserwartung als stabiles Persönlichkeitsmerkmal die Überzeugung charakterisiert, schwierigen Anforderungen adäquat gewachsen zu sein (Schwarzer, 1994), beschreibt Optimismus eine generelle positive Zukunftserwartung, die unabhängig von der Bewertung eigener Fähigkeiten besteht (Schleier & Carver, 1985). Soziale Kompetenz als weiterer personaler protektiver Faktor bezeichnet Empathie und Problemlösestrategien im Umgang mit Menschen des sozialen Umfeldes sowie die soziale Ausdrucksfähigkeit (Luthar, 1993; Petermann, 2002).

Familiäre Faktoren wie ein hohes Maß familiärer Unterstützung und ein gutes Familienklima sagen in Studien auch für Risikogruppen eine gesunde psychische Entwicklung voraus (Brennan et al., 2003; Lewandowski et al., 2014; Pargas et al., 2010). Familiäre Unterstützung beschreibt die Zuwendung, Fürsorglichkeit und Kontrolle, die Eltern ihren Kindern entgegenbringen (Parker, Tulping & Brown, 1979). Demgegenüber wird mit dem Familienklima der familiäre Zusammenhalt und das elterliche Erziehungsverhalten charakterisiert (Schneewind, Beckmann & Hecht-Jackl, 1985).

Soziale Faktoren, beispielsweise soziale Unterstützung und Schulklima, werden ebenfalls mit einer gesunden psychischen Entwicklung in Verbindung gebracht (Beardslee & Podorefsky, 1988; Boyd & Waanders, 2013). Soziale Unterstützung (Schwarzer & Knoll, 2007) stellt eine Ressource dar, mit der psychosoziale (z. B. Anerkennung, Zugehörigkeit) und instrumentelle (z. B. Informationsbedarf, materieller Hilfebedarf) Bedürfnisse außerhalb der Familie befriedigt werden, was Kompetenzen stärken und Bewältigungsstrategien von Kindern optimieren kann. Als spezifischer sozialer Faktor erfasst das Schulklima, wie sich Kinder und Jugendliche in der Schule in Beziehungen zu Lehrkräften und Mitschülern sowie hinsichtlich der geforderten Leistungen akzeptiert fühlen.

Um Familien mit psychisch kranken Eltern angemessen unterstützen zu können, ist es notwendig, ausgewählte Faktoren genauer zu untersuchen, die bei einer elterlichen psychischen Erkrankung mit einer psychisch gesunden Entwicklung der Kinder verbunden sind (Wiegand-Grefe, Werkmeister, Bullinger, Plass & Petermann, 2012),

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da sie Ansatzpunkte für gezielte Interventionen bilden können (Wiegand-Grefe, Halverscheid & Plaß, 2011). Während protektive Faktoren für eine gesunde psychische Entwicklung von Kindern im Allgemeinen bereits gut erforscht wurden (Bettge & Ravens-Sieberer, 2003; Wille, Bettge & Ravens-Sieberer, 2008), fehlt bisher die Analyse von spezifischen Faktoren bei Kindern psychisch kranker Eltern in einer großen Bevölkerungsstichprobe. Die bisherigen oben dargestellten Forschungsergebnisse beziehen sich auf Kinder von Eltern mit psychischen Erkrankungen, demgegenüber wurden im Rahmen der bundesweit repräsentativen Befragung zum seelischen Wohlbefinden und Verhalten (BELLA-Studie) psychische Auffälligkeiten der Kinder sowie die psychische Belastung der Eltern erhoben, aber keine klinischen Diagnosen gestellt. Deshalb bezieht sich die vorliegende Studie aus der BELLA-Studie auf Eltern, die aktuell eine psychische Belastung aufweisen.

Fragestellung

Hauptfragestellung der vorliegenden Arbeit ist, welche Faktoren bei Kindern psychisch belasteter Eltern mit einer gesunden psychischen Entwicklung verbunden sind. In Hinblick auf die Entwicklung spezifischer Maßnahmen werden personenbezogene (personale), familiäre und soziale Faktoren untersucht, die durch präventive oder therapeutische Interventionen positiv beeinflusst werden können.

Aufgrund der Ergebnisse aus Vorarbeiten (Lewandowski et al., 2014; Pargas et al., 2010) ist insbesondere die Frage, ob die Kombination von Faktoren aus verschiedenen Bereichen für eine gesunde psychische Entwicklung förderlich ist.

Da bei psychisch belasteten Eltern Familienklima und elterliche Funktionen beeinträchtigt sein können, wird außerdem untersucht, ob fördernde Faktoren außerhalb der Familie, wie die soziale Unterstützung und das Schulklima für eine gesunde psychische Entwicklung relevant sind.

Methoden

Studiendesign

Das Studiendesign und die angewandten Methoden werden von Ravens-Sieberer, Klasen und Petermann (2016) detailliert beschrieben.

Stichprobe

Der vorliegenden Arbeit lag eine Unterstichprobe der zum BELLA-Messzeitpunkt 4 befragten Familien zugrunde. In der Altersgruppe der 13- bis 17-jährigen Kinder und Jugendlichen ($N = 1\,113$) wurden die Familien ausgewählt, in denen die Eltern eine psychische Belastung angaben. Für die Analysen wurde der Selbstbericht von insgesamt $N = 165$ Kindern von Eltern mit psychischer Belastung (leibliche Mütter $n = 145$, 87.9 %; leibliche Väter $n = 20$, 12.1 %) herangezogen. Etwas mehr als 90 % der Mütter wurden von den Kindern als primäre weibliche Bezugsperson bezeichnet ($n = 135$, 93 %), die Väter wurden zu 95 % ($n = 19$) als primäre männliche Bezugsperson bezeichnet. Die Kinder waren im Durchschnitt 15.86 ($SD = 1.43$) Jahre alt und zu 53.3 % ($n = 88$) weiblich. Die Familien wiesen überwiegend (66.1 %, $n = 109$) einen mittleren sozioökonomischen Status auf, 18.8 % ($n = 31$) einen hohen und 14.5 % ($n = 24$) einen niedrigen.

Kinder psychisch belasteter Eltern (13.3 %, $n = 21$ von 158) gaben gegenüber Kindern psychisch nicht belasteter Eltern (8.2 %, $n = 74$ von 906) signifikant häufiger psychische Auffälligkeiten an ($\chi^2 = 4.34$, $df = 1$, $p = 0.037$). In der Stichprobe Kinder psychisch belasteter Eltern wurde mittels Pearson-Korrelation ein mittelstarker negativer Zusammenhang zwischen psychischer Auffälligkeit und gesundheitsbezogener Lebensqualität nachgewiesen ($r = -0.41$; $p < 0.001$). Die vorliegende Stichprobe von $N = 165$ Kindern psychisch belasteter Eltern ist entsprechend den Ergebnissen früherer Studien mit Kindern psychisch kranker Eltern charakterisiert durch eine schlechtere psychische Gesundheit und gesundheitsbezogene Lebensqualität als die Gesamtbevölkerung.

Erhebungsverfahren

Risiko-Merkmale

Psychische Belastung der Eltern wurde im Selbsturteil der Eltern mit der von Klaghofer und Brähler (2001) entwickelten *Symptom-Checkliste-Kurzversion-9 (SCL-K-9)*, der eindimensionalen Kurzversion der *Symptomcheckliste-90-R (SCL-90-R)* (Derogatis, Lipman, Rickels, Uhlenhuth & Covi, 1974) erfasst, die für die zurückliegenden sieben Tage psychische Auffälligkeiten und Beschwerden abbildet. Die Summe aller Antworten bildet den Global Severity Index (GSI), der den psychischen Beschwerdedruck abbildet. Da ein Cut-off-Wert des GSI für *psychische Belastung* fehlt, wurden in der vorliegenden Studie nach Umrechnung die entsprechenden Cut-off-Werte der SCL-

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90-R verwendet (Franke, 2002) und die Eltern dementsprechend als *psychisch belastet* oder *psychisch nicht belastet* klassifiziert. Dieses Vorgehen wurde gewählt, um die psychische Belastung der Eltern stichprobenunabhängig zu definieren.

Outcome-Merkmale

Psychische Auffälligkeiten der Kinder und Jugendlichen wurde mit dem *Strengths and Difficulties Questionnaire (SDQ)* im Selbsturteil erhoben (Goodman, 1999; Goodman, Meltzer & Bailey, 1998). Der *SDQ* erfasst mit je fünf Items für die zurückliegenden sechs Monate Verhaltensauffälligkeiten und –stärken der Kinder und Jugendlichen in den folgenden Bereichen: *Emotionale Probleme, Hyperaktivität/Aufmerksamkeitsprobleme, Probleme im Umgang mit Gleichaltrigen, Verhaltensauffälligkeiten und Prosoziales Verhalten.* Die Werte der ersten vier genannten Skalen werden zu einem Gesamtproblemwert aufsummiert und als *normal, grenzwertig* oder *auffällig* klassifiziert.

Gesundheitsbezogene Lebensqualität der Kinder und Jugendlichen wurde mit dem *KIDSCREEN-10* (Ravens-Sieberer et al., 2010), einer Kurzversion des *KIDSCREEN-52*, erfasst, der mit zehn Items auf jeweils 5-stufigen Antwortskalen (von *niemals/überhaupt nicht* bis *immer/sehr*) körperliche, psychische und soziale Aspekte der gesundheitsbezogenen Lebensqualität für die zurückliegende Woche abbildet. Für die vorliegende Arbeit wurde die Selbsteinschätzung der Kinder und Jugendlichen verwendet.

Merkmale der Gesunderhaltung

Personale Faktoren

Selbstwirksamkeitserwartung wurde mit der zehn Items umfassenden Skala zur Allgemeinen Selbstwirksamkeit von Schwarzer und Jerusalem (1995) erhoben. Die Items sind als Aussagen formuliert, beispielsweise „Die Lösung schwieriger Probleme gelingt mir, wenn ich mich darum bemühe.“, und werden auf einem 4-stufigen Antwortformat von stimmt nicht bis stimmt genau beantwortet. In der vorliegenden Stichprobe betrug Cronbachs α = .84.

Optimismus wurde mit einer modifizierten Version des Berner Wohlbefindensfragebogens (Grob et al., 1991) mit vier Items erfasst. Aussagen wie beispielsweise „Meine Zukunft sieht gut aus.“, wurden von Kindern und Jugendlichen auf einer 6-stufigen Skala von total falsch bis total richtig eingeschätzt. In der vorliegenden Stichprobe betrug Cronbachs α = .72.

Soziale Kompetenz wurde mit fünf Items erhoben, die in der HBSC (Health Behavior in School-aged Children)-Studie entwickelt wurden (Currie, Samdal, Boyce & Smith, 2001). Aussagen wie „Ich habe viele Freunde.“ wurden auf einer 4-stufigen Skala von beschreibt mich überhaupt nicht bis beschreibt mich genau eingeschätzt. In der vorliegenden Stichprobe betrug Cronbachs α = .97.

Familiäre Faktoren

Familienklima wurde mit einer modifizierten Version der Familienskala von Schneewind erfasst (Schneewind et al., 1985). Aussagen wie „In unserer Familie geht jeder auf die Sorgen und Nöte des anderen ein.“ oder „Bei uns vergeht kein Wochenende, ohne dass wir etwas unternehmen.“, wurden von Kindern und Jugendlichen auf einer 4-stufigen Skala von stimmt nicht bis stimmt genau bewertet. In der vorliegenden Stichprobe betrug Cronbachs α = .98.

Familiäre Unterstützung wurde mit einer modifizierten und verkürzten Form des Parental Bonding Instrument (PBI) erfasst (Parker et al., 1979). Es wurden Items aus den zwei Subskalen Fürsorge und Überbehütung oder Kontrolle verwendet. Aussagen wie „Meine Eltern/meine Bezugspersonen sind liebevoll.“ wurden von den Kindern und Jugendlichen auf einer 3-stufigen Antwortskala von nie bis fast immer bewertet. In der vorliegenden Stichprobe betrug Cronbachs α = .99.

Soziale Faktoren

Allgemeine soziale Unterstützung wurde mit den drei folgenden Items erhoben:

„Wie viele Menschen sind Dir so nahe, dass Du auf sie zählen kannst, wenn Du ernste Probleme hast?

Wie viel Anteilnahme nehmen Menschen an dem, was Du tust?

Wie leicht kannst Du praktische Hilfe von Deiner Familie, Deinen Freunden oder Nachbarn bekommen, wenn Du sie brauchst?“

Die drei eingesetzten Items werden auf unterschiedlich skalierten Formaten beantwortet. In der vorliegenden Stichprobe betrug Cronbachs α = .94.

Schulklima wurde mit Hilfe von fünf Items erfasst, zwei Fragen beziehen sich auf die Lehrkräfte (z. B. „Wie beurteilen Deine Lehrer Deine Leistungen im Vergleich zu Deinen Mitschülern?“; 4-stufiges Antwortformat von überhaupt nicht gut bis sehr gut) und drei auf die Mitschüler (z. B. „Die meisten Schüler in meiner Klasse sind nett und hilfsbereit.“; 5-stufiges Antwortformat von stimmt überhaupt nicht bis stimmt genau). In der vorliegenden Stichprobe betrug Cronbachs α = .98.

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Statistische Analysen

Für die Erhebungsverfahren zur psychischen Belastung der Eltern sowie zur psychischen Auffälligkeit und gesundheitsbezogenen Lebensqualität der Kinder und Jugendlichen wurden die Skalenwerte manualkonform berechnet. Für die Skalen zur Erfassung der Faktoren der Gesunderhaltung wurden jeweils Mittelwerte errechnet. Multiple lineare Regressionen wurden durchgeführt, um zu testen, ob die Faktoren der Gesunderhaltung psychische Auffälligkeit und gesundheitsbezogene Lebensqualität vorhersagen. Fehlende Werte wurden mit Hilfe der Expectation-Maximalization-Imputation (siehe Textkasten) ersetzt (Dempster, Laird & Rubin, 1977). Alle Analysen wurden mit Hilfe des Softwarepakets IBM SPSS Version 22.0 durchgeführt.

Kasten 1. EM-Imputation

In dieser Untersuchung wurde der Expectation-Maximization-Algorithmus (EM-Algorithmus) als Imputationsverfahren verwendet (Dempster, Laird & Rubin, 1977), um fehlende Werte der statistischen Erhebung in der Datenmatrix zu vervollständigen. Hierbei werden fehlende Werte durch plausible Werte ersetzt, die mit Hilfe der beobachteten Werte des gleichen Datensatzes geschätzt werden. Dabei wird mit einem zufällig gewählten Modell gestartet und dann abwechselnd die Zuordnung der Daten zu den einzelnen Teilen des Modells (Expectation-Schritt) und die Parameter des Modells an die neueste Zuordnung (Maximization-Schritt) verbessert. In beiden Schritten wird dabei die Qualität des Ergebnisses verbessert: Im Expectation-Schritt werden die Punkte besser zugeordnet, im Maximization-Schritt wird das Modell so verändert, dass es besser zu den Daten passt. Findet keine wesentliche Verbesserung mehr statt, beendet man das Verfahren. Voraussetzung für die Anwendung der EM-Imputation ist, dass der Anteil der fehlenden Werte der einzelnen Studienteilnehmer und der einzelnen Items in den verschiedenen Erhebungsverfahren unter 30 % liegt. Diese Voraussetzung war in der vorliegenden Studie erfüllt. Das vorliegende Ergebnis der Imputation wurde mit der Berechnung von Effektstärken überprüft, indem die Mittelwerte der einzelnen Items mit fehlenden Werten mit den Mittelwerten der gleichen Items nach Imputation verglichen wurden. Es zeigten sich Effektstärken von g = 0.00 bis 0.03; entsprechend ist davon auszugehen, dass durch die Imputation keine Unterschiede zwischen den Itemmittelwerten entstanden sind.

Ergebnisse

Die psychisch belasteten Eltern gaben als häufigste Belastung Depression an (39.4 %, n = 65), gefolgt von Unsicherheit im Sozialkontakt (30.9 %, n = 30), Zwanghaftigkeit (18.2 %, n = 30), Ängstlichkeit (17.6 %, n = 29) und Somatisierung (17 %, n = 28). Dabei waren Mehrfachnennungen möglich.

Um den Einfluss der oben beschriebenen Faktoren der Gesunderhaltung auf die psychische Auffälligkeit der Kinder psychisch belasteter Eltern darzustellen, wurde eine multiple lineare Regression durchgeführt (siehe Tab. 1).

Tabelle 1. Multiple lineare Regression zur Vorhersage der psychischen Gesundheit

	B	*SE*	β	*p*
Konstante	33.88	4.71		.000
Alter	.01	.20	.01	.944
Geschlecht	.68	.59	.08	.252
SES	-.10	.09	-.08	.284
Personale Faktoren				
Selbstwirksamkeitserwartung	.09	.84	.01	.914
Optimismus	-1.01	.65	-.13	.125
Soziale Kompetenz	-2.10	.61	-.27	.001*
Familiäre Faktoren				
Familienklima	-.48	.72	-.06	.502
Familiäre Unterstützung	-2.77	1.16	-.21	.018*
Soziale Faktoren				
Soziale Unterstützung	-.27	.65	-.03	.686
Schulklima	-1.33	.61	-.16	.029*

Anmerkungen: Outcome: SDQ im Selbsturteil. n = 157. Signifikante Prädiktoren sind mit * gekennzeichnet. F = 8.83. df = 10/147. $p < .001$. R^2 = 33.3 %.

Signifikante Prädiktoren zur Vorhersage von geringerer psychischer Auffälligkeit waren soziale Kompetenz als personaler Faktor, familiäre Unterstützung als familiärer Faktor und Schulklima als sozialer Faktor. Alter und Geschlecht sowie sozioökonomischer Status hatten keinen Einfluss auf berichtete psychische Auffälligkeiten. Das Modell leistete eine Varianzaufklärung von 33 %.

In einer zweiten multiplen linearen Regression wurde der Einfluss der Faktoren der Gesunderhaltung auf die gesundheitsbezogene Lebensqualität überprüft (siehe Tab. 2). Signifikante Prädiktoren zur Vorhersage besserer gesundheitsbezogener Lebensqualität waren Selbstwirksamkeitserwartung und Optimismus als personale Faktoren, Familienklima als familiärer Faktor und Schulklima

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Tabelle 2. Multiple lineare Regression zur Vorhersage der gesundheitsbezogenen Lebensqualität

	B	*SE*	β	*p*
Konstante	-1.77	8.61		.837
Alter	-.44	.37	-.07	.238
Geschlecht	-.92	1.08	-.05	.397
SES	-.01	.16	-.01	.938
Personale Faktoren				
Selbstwirksamkeitserwartung	3.95	1.51	.18	.010*
Optimismus	3.94	1.18	.25	.001*
Soziale Kompetenz	1.03	1.09	.07	.344
Familiäre Faktoren				
Familienklima	3.02	1.29	.18	.020*
Familiäre Unterstützung	2.03	2.07	.08	.327
Soziale Faktoren				
Soziale Unterstützung	.88	1.17	.06	.451
Schulklima	3.58	1.08	.22	.001*

Anmerkungen: Outcome: KIDSCREEN-10 im Selbsturteil. Signifikante Prädiktoren sind mit * gekennzeichnet. $n = 153$. $F = 14.75$. $df = 10/143$. $p < .001$. $R^2 = 47.3\,\%$.

als sozialer Faktor. Alter und Geschlecht sowie sozioökonomischer Status hatten keinen Einfluss auf die berichtete gesundheitsbezogene Lebensqualität. Das Modell leistete eine Varianzaufklärung von 47 %.

Diskussion

Die vorliegende Arbeit untersucht Faktoren der psychischen Gesunderhaltung von Kindern psychisch belasteter Eltern in einer repräsentativen Stichprobe für Deutschland unter Verwendung der Selbsteinschätzung der Kinder und Jugendlichen.

Der Anteil psychisch belasteter Eltern von etwa 15 % in dieser Stichprobe ist niedriger als in anderen epidemiologische Studien (Wittchen et al., 2011), entspricht aber der Rate psychischer Belastungen der Eltern in anderen BELLA-Substichproben (Wille et al., 2008).

Kinder psychisch belasteter Eltern schätzten sich selbst in 13.3 % als psychisch auffällig oder grenzwertig ein, dies stellt gegenüber Vorarbeiten mit klinischen Stichproben von Kindern psychisch kranker Eltern, in denen etwa 50 % als psychisch auffällig eingestuft werden (Lapalme, Hodgins & La Roche, 1997; Wiegand-Grefe, Geers, Plaß, Petermann & Riedesser, 2009), eine deutlich niedrigere Rate psychischer Auffälligkeiten dar. Auch epidemiologische Daten ermitteln für Kinder psychisch kranker Eltern eine höhere Prävalenz psychischer Erkrankungen (McLaughlin et al., 2012). Die unterschiedlichen Prävalenzraten müssen in Hinblick auf die verwendeten Beurteilerperspektiven diskutiert werden (Petermann, 2005): In der vorliegenden Studie führt das ausschließlich verwendete Selbsturteil der Kinder und Jugendlichen zu einer geringeren Prävalenz psychischer Auffälligkeiten als das ebenfalls erhobene aber hier nicht berichtete Elternurteil. Da jedoch Vorbefunde zu Beurteilungstendenzen von psychisch kranken Eltern sehr heterogen sind (Najman et al., 2000; Tarullo, Richardson, Radke-Yarrow & Martinez, 1995) und Verzerrungen aufgrund der elterlichen Symptomatik nicht ausgeschlossen werden können, wurde in der vorliegenden Studie das Selbsturteil der Kinder und Jugendlichen verwendet.

Wie aufgrund der Vorarbeiten im Bereich Kinder psychisch kranker Eltern zu erwarten, beurteilten sich Kinder psychisch belasteter Eltern (13.3 %) gegenüber Kindern psychisch nicht belasteter Eltern (8.2 %) signifikant häufiger als psychisch auffällig oder grenzwertig. Auch bei Kindern psychisch nicht belasteter Eltern fällt die Prävalenz für psychische Auffälligkeiten in der vorliegenden Stichprobe deutlich geringer aus als aufgrund von Metaanalysen (Barkmann & Schulte-Markwort, 2012) zu erwarten (17.6 %). Dies ist ebenfalls auf die Selbsteinschätzung der Kinder und Jugendlichen zurückzuführen.

Sowohl die psychische Gesundheit als auch die gesundheitsbezogene Lebensqualität der Kinder psychisch belasteter Eltern wurde durch eine Kombination von personalen, familiären und sozialen Faktoren vorhergesagt. Für die psychische Gesundheit der Kinder und Jugendlichen war als personaler Faktor die soziale Kompetenz, als familiärer Faktor die familiäre Unterstützung und als sozialer Faktor das Schulklima signifikant. Für die gesundheitsbezogene Lebensqualität waren als personale Faktoren Selbstwirksamkeitserwartung und Optimismus, als familiärer Faktor das Familienklima und als sozialer Faktor das Schulklima signifikant.

Obwohl psychische Gesundheit und gesundheitsbezogene Lebensqualität viele Gemeinsamkeiten aufweisen (Wiegand-Grefe, Jeske, Bullinger, Plass & Petermann, 2010), werden sie in der vorliegenden Stichprobe von jeweils unterschiedlichen Unterfaktoren vorhergesagt, Ausnahme bildet hierbei nur das Schulklima. Die psychische Gesundheit wird von Unterfaktoren vorhergesagt, die insbesondere Beziehungsaspekte beinhalten, einerseits zum sozialen Umfeld (soziale Kompetenz) und andererseits zu den Eltern (familiäre Unterstützung). Die gesundheitsbezogene Lebensqualität dagegen hängt mit Aspekten zusammen, die sich auf eigene Fähigkeiten (Selbstwirksamkeitserwartung), eine positive Zukunftserwartung (Optimismus) und guten Familienzusammenhalt (Familienklima) beziehen.

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Während in der vorliegenden Studie eine Kombination personaler, familiärer und sozialer Faktoren psychische Gesundheit und gesundheitsbezogene Lebensqualität vorhersagten, waren in einer anderen Stichprobe der BELLA-Studie von 1 559 Kindern und Jugendlichen im Alter von 11 bis 17 Jahren, die unterschiedliche Risikofaktoren aufwiesen (z. B. niedrige soziale Schicht, familiäre Konflikte, unerwünschte Schwangerschaft, Arbeitslosigkeit), personale und familiäre Faktoren die wichtigsten protektiven Faktoren für die psychische Gesundheit (Wille et al., 2008). Als personaler Faktor war das Selbstkonzept mit den vier Bereichen kognitive Kompetenz, Sportkompetenz, Peerakzeptanz, Aussehen sowie dem globalen Selbstwertgefühl signifikant, als familiärer Faktor das Familienklima. Während also für Kinder mit unterschiedlichen Risikofaktoren personale und familiäre Ressourcen als Schutzfaktoren eine wichtige Rolle spielen, ist für Kinder psychisch belasteter Eltern mit dem Schulklima zusätzlich zu personalen und familiären Faktoren ein sozialer Faktor für die gesunde psychische Entwicklung ausschlaggebend. Dies bestätigt unsere Hypothese, dass Kinder psychisch belasteter Eltern von Ressourcen außerhalb der Familie besonders profitieren.

Das Schulklima wurde sowohl für die psychische Auffälligkeit als auch für die gesundheitsbezogene Lebensqualität als signifikanter sozialer Faktor der Gesunderhaltung ermittelt. Aus Vorstudien ist bekannt, dass sich Kinder psychisch kranker Eltern, die eine gute psychische Entwicklung aufweisen, als Personen beschreiben, die sich aktiv im schulischen und sozialen Umfeld engagieren (Beardslee & Podorefsky, 1988). Positive Schulleistungen weisen protektive Effekte auf und können als Quelle der Selbstbestätigung dienen; negative Erfahrungen in der Familie können durch diese Erfolgserlebnisse besser kompensiert werden (Masten et al., 2009; Rutter, 1990). Auch der Kontakt zu gleichaltrigen Mitschülern, der mit dem Schulklima ebenfalls erfasst wurde, ist für Kinder und Jugendliche mit psychisch belasteten Eltern von zentraler Bedeutung.

Für zukünftige Arbeiten zu Faktoren der Gesunderhaltung bei Kindern psychisch belasteter Eltern sind die folgenden konzeptuellen und methodischen Überlegungen relevant: Um gegenüber der hier verwendeten psychischen Belastung der Eltern im Eigenurteil einen differenzierteren Zusammenhang von elterlicher Symptomatik mit Belastungen der Kinder darstellen zu können, sollten zukünftige Studien elterliche Diagnosen und Belastungen im Eigen- und Fremdurteil mit spezifischer Diagnostik erheben. Außerdem könnten mit Hilfe längsschnittlicher Daten kausale Zusammenhänge weiter aufgeklärt werden. Ein Längsschnittdesign bietet auch die Möglichkeit, Dauer und Zeitraum der elterlichen psychischen Belastung, das Alter der Kinder in Bezug auf die elterliche psychische Belastung sowie Informationen über die psychische Belastung des zweiten Elternteils zu berücksichtigen, da dies in Vorstudien für die Ausprägung psychischer Auffälligkeiten der Kinder relevant war (Brennan et al., 2000; Hammen, Brennan & Shih, 2004; McLaughlin et al., 2012). Auch wäre es wünschenswert, Mütter und Väter in einem ausgewogenen Verhältnis einzubeziehen, um geschlechtsspezifische Effekte untersuchen zu können. Die Güte der verwendeten Erhebungsverfahren sollte in zukünftigen Arbeiten weiter überprüft werden.

Schlussfolgerungen für die klinische Praxis

Die Identifikation von Faktoren der Gesunderhaltung bei Kindern psychisch belasteter Eltern bildet die Voraussetzung für die Entwicklung und Implementierung präventiver und therapeutischer Maßnahmen, die das bekannte hohe Risiko dieser Kinder, selbst psychische Auffälligkeiten zu entwickeln, minimieren können. Die vorliegende Arbeit bietet Ansatzpunkte, die bei der Entwicklung spezifischer Interventionsprogramme Berücksichtigung finden sollten.

In Hinblick auf eine gesunde psychische Entwicklung profitieren Kinder psychisch belasteter Eltern insbesondere von einer Kombination personaler, familiärer und sozialer Ressourcen. Für die Arbeit mit Kindern und Familien mit psychisch belasteten Eltern kann daraus abgeleitet werden, dass zunächst eine differenzierte Diagnostik der Ressourcen in diesen drei Bereichen durchgeführt werden sollte, um Defizite zu erfassen und davon ausgehend spezifische Förderung und Unterstützung anbieten zu können.

Als ein bedeutsamer Faktor der Gesunderhaltung, der sowohl hinsichtlich psychischer Auffälligkeit als auch gesundheitsbezogener Lebensqualität relevant war, wurde das Schulklima identifiziert. Dies ist ein Hinweis darauf, dass sich die Arbeit mit Kindern und Familien mit psychisch belasteten Eltern nicht allein auf das familiäre Setting konzentrieren, sondern mit der Schule auch einen Lebensbereich berücksichtigen sollte, in dem Kinder mit höherem Alter zunehmend unabhängig von ihrem familiären Umfeld unterstützende Beziehungserfahrungen machen können.

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Conclusions

Publication 3 analysed potential protective factors for child and adolescent mental health and HRQoL in families with parental mental health problems. Good mental health was predicted by relational factors, particularly those involving connections with parents (i.e., parental support) and the social environment (i.e., social competence). In contrast, HRQoL was associated with aspects related to one's own abilities and a positive outlook (i.e., self-efficacy, optimism), and strong family cohesion (family climate).

Publications 2 and 3 investigated the at-risk group of families with parental mental health problems and demonstrated how their children and adolescents are subject to a heightened risk to develop mental health problems themselves. The publications also identified important personal, familial, and social protective factors für good mental health and HRQoL. However, not all children and adolescents demonstrate resilient or positive developmental trajectories. In high-stress environments, some may externalise their strain through externalising behaviours such as aggression, defiance, or risk-taking (see Chapter 2.6.4).

The fourth publication included in this thesis therefore examines another particularly vulnerable subgroup – youths with externalising mental health problems. Adolescents with behavioural issues have long been the subject of extensive research. As early as the early 20th century, scholars such as Hall (see Chapter 2.1.1) recognised the challenging and transitional nature of adolescence and its potential links to behavioural difficulties. Furthermore, the longstanding awareness of adolescents' heightened vulnerability is reflected by the example of the child guidance clinics, as illustrated in Chapter 2.1.2 with. Publication 4 therefore investigates long-term consequences associated with externalising mental health problems during adolescence which may have negative effects throughout the life course.

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5.4. Long-Term Outcomes in Early Adulthood of Externalised Mental Health Problems in Adolescence

Publication 4

Haller, A-C., Klasen, F., Petermann, F., Barkmann, C., Otto, C., Schlack, R., & Ravens-Sieberer, U. (2016). Langzeitfolgen externalisierender Verhaltensauffälligkeiten: Ergebnisse der BELLA-Kohortenstudie [Long-term consequences of externalized mental health problems: Results of the BELLA cohort study]. *Kindheit und Entwicklung, 25*(1), 31–40.

Overview

This fourth publication examines the vulnerable group of adolescents with externalising symptoms. It explores the long-term outcomes of these symptoms by analysing risk behaviours in young adults who reported externalising mental health problems between the ages of 12 and 17. The investigated risk behaviours in young adulthood include problematic alcohol use, illegal drug use, delinquency, a propensity toward violence, and financial struggles.

Research Questions

4.1 How often do long-term behavioural and psychosocial outcomes – such as substance use, delinquency, propensity toward to violence, or financial struggles – occur in young adults who reported externalising mental health problems during adolescence?

4.2 What is the increased risk of engaging in these behaviours six years after initial identification of externalising problems, compared to peers without such problems in adolescence??

4.3 How do age, gender, SES status, and co-occurring internalising problems influence these risks?

Sample

To address these research questions, data from N = 629 children and adolescents who participated in both the baseline survey of the BELLA study and the third follow-up six years later were analysed. The present sample includes adolescents who were between 12 and 17 years old at the time of the baseline assessment. Slightly more than half of the participants were female (n = 345, 54.8%). The average age was M = 14.3 years (SD = 1.69 years).

Results

Among the total sample, n = 116 (18.4%) participants aged between 12 and 17 years were identified with externalising behaviour problems at baseline. Six years later as young adults, 27.6% indicated problematic alcohol consumption, 13.8% participated in illegal drug use, 19.0% exhibited delinquent behaviours, 41.4% showed a propensity for violence, and 29.3% reported financial struggles. Furthermore, it was found that those who had shown externalising symptoms in adolescence were up to more than twice as likely to engage in risk behaviours

such as problematic alcohol consumption, illegal drug use, delinquency, and propensity to violence in adulthood, compared to young adults who had not shown externalising mental health problems in adolescence. Boys with externalising behaviours from lower SES backgrounds were particularly at risk for problematic alcohol use, delinquency, and violent tendencies later in young adulthood. Illegal drug use in young adulthood was associated with externalising mental health problems in adolescence only. Up to 16.5% of the observed risk behaviours in early adulthood could be attributed to externalising behaviour problems during adolescence.

Publication 4

Haller, A-C., Klasen, F., Petermann, F., Barkmann, C., Otto, C., Schlack, R., & Ravens-Sieberer, U. (2016). Langzeitfolgen externalisierender Verhaltensauffälligkeiten: Ergebnisse der BELLA-Kohortenstudie [Long-term consequences of externalized mental health problems: Results of the BELLA cohort study]. *Kindheit und Entwicklung, 25*(1), 31–40.

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Studie

Langzeitfolgen externalisierender Verhaltensauffälligkeiten

Ergebnisse der BELLA-Kohortenstudie

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Zusammenfassung. Externalisierende Auffälligkeiten bei Kindern und Jugendlichen gehen häufig mit späteren Risikoverhaltensweisen wie Substanzkonsum, Delinquenz und Gewaltbereitschaft sowie finanziellen Problemen einher. Anhand längsschnittlicher Daten einer bundesweiten, populationsbasierten Stichprobe von 12- bis 17-jährigen Kindern und Jugendlichen (N = 629) wird der Zusammenhang zwischen externalisierenden Verhaltensauffälligkeiten (n = 116) und möglichen Langzeitfolgen beschrieben. 27.6 % der Teilnehmenden mit externalisierenden Verhaltensauffälligkeiten wiesen sechs Jahre später riskanten Alkoholkonsum auf, 13.8 % konsumierten illegale Drogen, 19 % zeigten Delinquenz und 41.4 % Gewaltbereitbereitschaft, während 29.3 % von finanziellen Problemen berichteten. Insbesondere Jungen mit externalisierenden Verhaltensauffälligkeiten aus Familien mit niedrigem sozioökonomischem Status standen unter Risiko für späteren riskanten Alkoholkonsum, Delinquenz und Gewaltbereitschaft. Externalisierende Verhaltensauffälligkeiten in Kindheit und Jugend standen unabhängig von Geschlecht, Alter und sozioökonomischem Status in Zusammenhang mit illegalem Drogenkonsum im Erwachsenenalter. Von finanziellen Problemen im Erwachsenenalter waren die älteren Jugendlichen mit niedrigem sozioökonomischem Status betroffen. Bis zu 16.5 % der untersuchten Risikoverhaltensweisen waren dem Vorkommen externalisierender Verhaltensauffälligkeiten geschuldet.

Schlüsselwörter: Externalisierende Verhaltensauffälligkeiten, Langzeitfolgen, Substanzkonsum, Delinquenz, finanzielle Probleme

Long-Term Consequences of Externalized Mental Health Problems: Results of the BELLA Cohort Study

Abstract. Mental disorders during childhood and adolescence negatively affect young people's development and can give rise to long-term consequences. Child and adolescent mental disorders also yield longstanding costs to society that are multiplied by the loss of economic productivity in adulthood. Longitudinal studies have associated externalizing behavior problems with subsequent risk behaviors such as substance use, delinquency, violence, or financial struggles multiple times. Regarding German children and adolescents, only little is known about the subsequent risk behaviors associated with externalizing behavior problems in childhood and adolescence. This study reports on the long-term consequences in early adulthood based on data from the longitudinal BELLA study (the mental health module of the German National Health Interview and Examination Survey for children and adolescents). We examined a sample of N = 629 children and adolescents aged 12 – 17 years with externalizing behavior problems. Data were taken from the BELLA study at baseline and a follow-up assessment conducted 6 years later. The risk of externalizing behavior problems in childhood and adolescence for long-term consequences (problematic alcohol use, illegal drug use, delinquency, propensity to violence, financial struggles) in early adulthood was assessed by means of odds ratios and 95 % confidence intervals. Population-attributable risk percentages were calculated to evaluate the degree to which externalizing behavior problems are accountable for the occurrence of long-term consequences. Several multiple logistic regressions were computed with each of the risk behaviors as outcome and with age, gender, socioeconomic status, and internalizing problems as control variables. German children and adolescents with externalizing behavior problems (n = 116) significantly more often reported long-term consequences in early adulthood than did children and adolescents without externalizing behavior problems. Six years later, 27.6 % (n = 32) of the children and adolescents with externalizing behavior problems reported problematic alcohol use and 13.8 % (n = 16) illegal drug use. Further, 19 % (n = 22) showed delinquency, 41.4 % (n = 48) showed propensity to violence, and 29.3 % (n = 34) reported financial struggles. After

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controlling for age, gender, socioeconomic status, and internalizing problems, the at-risk group for problematic alcohol use, delinquency, and propensity to violence included boys with externalizing behavior problems from families with a lower socioeconomic status. Illegal drug use was correlated with externalizing behavior problems only. Financial struggles correlated with older age and lower socioeconomic status. Up to 16.5% of the cases with long-term consequences could be ascribed to externalizing behavior problems. These findings illustrate the necessity to identify children and adolescents at risk and to place greater emphasis on early prevention services.

Keywords: externalizing behavior problems, long-term consequences, substance use, delinquency, financial struggles

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Psychische Auffälligkeiten in Kindheit und Jugend können nicht nur die Betroffenen, die Familie und das soziale Umfeld spürbar belasten (Hölling et al., 2014), sondern auch weitreichende Folgen für den weiteren Lebensverlauf nach sich ziehen (Belfer, 2008). Insbesondere externalisierende Verhaltensauffälligkeiten im Kindes- und Jugendalter stehen in Zusammenhang mit möglichen Langzeitfolgen, wie Substanzkonsum, Delinquenz, oder Arbeitslosigkeit im Erwachsenenalter (Fergusson, Horwood & Ridder, 2005). Externalisierende Verhaltensauffälligkeiten zeitigen auch nicht zu unterschätzende Kosten für die Gemeinschaft (Belfer, 2008). Eine Analyse deutscher Krankenkassendaten aus dem Zeitraum von 2006 bis 2009 belegt, dass bei Jugendlichen mit Störungen des Sozialverhaltens knapp viermal so hohe Kosten zu verzeichnen sind als bei Jugendlichen einer Kontrollgruppe ohne Störungen des Sozialverhaltens (Ewest, Reinhold, Vloet, Wenning & Bachmann, 2013). Weitere, durch Langzeitfolgen externalisierender Störungen verursachte direkte und indirekte Kosten entstehen im Strafjustiz- und Sozialwesen (Scott, Knapp, Henderson & Maughan, 2001) oder durch Produktivitätsausfall am Arbeitsplatz (Belfer, 2008; Karow et al., 2013).

Externalisierende Verhaltensauffälligkeiten bei Kindern und Jugendlichen umfassen aggressive, hyperaktive und dissoziale Verhaltensweisen (Achenbach, 1991). Diese Auffälligkeiten können entweder kategorial oder dimensional erfasst werden. International anerkannte, dimensionale Erhebungsverfahren für externalisierende Verhaltensauffälligkeiten umfassen beispielsweise die Child Behavior Checklist (CBCL, Achenbach, 1991) und den Strengths and Difficulties Questionnaire (SDQ, Goodman, 1997). In Deutschland zeigen zwischen 14.2% (erfasst mit der CBCL) und 22.7% (erfasst mit dem SDQ) der 11- bis 17-Jährigen Symptome externalisierender Verhaltensauffälligkeiten (Ravens-Sieberer et al., 2008; Hölling, Erhart, Ravens-Sieberer & Schlack, 2007), wobei die Symptome in der Tendenz in der Jugend zu- und im frühen Erwachsenenalter wieder abnehmen (vgl. Klasen et al., 2016).

Aktuelle Erklärungsansätze für die Entstehung externalisierender Verhaltensauffälligkeiten gehen von einem Zusammenwirken von biologischen und psychosozialen Faktoren aus. Diese Faktoren können überdies mit bestimmten Entwicklungsaufgaben und Lernerfahrungen (z. B. Verstärkung dysfunktionalen Verhaltens) interagieren und so den weiteren Verlauf externalisierender Verhaltensauffälligkeiten positiv oder negativ beeinflussen (Scheithauer, Mehren & Petermann, 2003). Im letzteren, negativen Fall spricht man auch von externalisierenden Entwicklungspfaden (Schulenberg & Maggs, 2008).

Zahlreiche Ergebnisse aus Längsschnittstudien bestätigen das psychopathologische Entwicklungsmodell externalisierender Entwicklungspfade. Kohortenstudien berichten konsistent von signifikanten Zusammenhängen zwischen externalisierenden Verhaltensauffälligkeiten in der Kindheit und Langzeitfolgen wie Alkoholmissbrauch (Colman et al., 2009), illegalen Drogenkonsum oder Drogenabhängigkeit (Fergusson et al., 2005; Fergusson, Horwood & Ridder, 2007), Delinquenz und Gewalt (Fergusson, Boden & Horwood, 2013; Fergusson et al., 2005) oder finanziellen Problemen (Fergusson et al., 2013; Moffitt et al., 2011). So belegen Daten der British Cohort Study, dass Jugendliche mit externalisierenden Verhaltensauffälligkeiten im Alter zwischen 13 und 15 Jahren 30 bis 40 Jahre später signifikant häufiger von Alkoholmissbrauch berichten als Jugendliche ohne externalisierende Verhaltensauffälligkeiten (Colman et al., 2009). Fergusson und Kollegen (2005) konnten darüber hinaus demonstrieren, dass das Ausmaß externalisierender Verhaltensauffälligkeiten im Alter zwischen sieben und neun Jahren mit dem Risiko, im jungen Erwachsenenalter Drogenabhängigkeit aufzuweisen oder (gewaltsames) delinquentes Verhalten zu zeigen, signifikant zusammenhängt. Fergusson, Arseneault und Belsky (2011) belegen ferner, dass externalisierende Verhaltensauffälligkeiten im Alter von sechs bis zehn Jahren neben Alkoholabhängigkeit, illegalem Drogenkonsum, Gewalt und Delinquenz auch signifikant mit armutsbezogenen Parametern zusammenhängen.

Neben externalisierenden Verhaltensauffälligkeiten existieren weitere Faktoren, die in Verbindung mit Risikoverhaltensweisen gebracht werden. Der Zusammenhang zwischen Geschlecht und Risikoverhaltensweisen im Erwachsenenalter ist gut belegt: Längsschnittstudien zeigen, dass Jungen signifikant häufiger problematischen Alkoholkonsum (Pitkanen, Lyyra & Pulkkinen, 2005) und illegalen Drogenkonsum (Von Sydow et al., 2001) im Erwachsenenalter aufweisen als Mädchen. Jungen werden zudem eher delinquent als Mädchen (Shoemaker, 2009). Für Geschlechtsunterschiede bei Gewaltausübung sind die Ergebnisse weniger eindeutig (Logan-Greene et al., 2011) und oft von soziokul-

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turellen Zuschreibungen von Geschlechterrollen abhängig (Richardson & Hammock, 2007).

Auch Kinder und Jugendliche aus Familien mit niedrigem sozioökonomischem Status weisen ein größeres Risiko auf, im Erwachsenenalter Risikoverhalten zu zeigen. So berichten Toumbourou und Kollegen (2007) in ihrem Meta-Review von einem klaren Zusammenhang zwischen dem Aufwachsen in sozioökonomisch benachteiligten Bedingungen und Substanzmissbrauch, Kriminalität und Gewalt.

In der Literatur wird aber auch der Zusammenhang zwischen internalisierenden Auffälligkeiten und späteren Risikoverhalten, vornehmlich Substanzkonsum, diskutiert (Colder et al., 2013). Internalisierende Auffälligkeiten können demnach sowohl als Risikofaktor wie auch als hemmender Faktor hinsichtlich späteren Substanzkonsum wirken (Fite, Colder & O'Connor, 2006). Der mit internalisierenden Auffälligkeiten verbundene soziale Rückzug und/oder die Angst vor negativen Folgen könnte es dem Kind oder Jugendlichen erschweren, sich Gleichaltrigen anzuschließen, die Alkohol und illegale Substanzen konsumieren (Fite et al., 2006).

Fragestellungen

Zu Langzeitfolgen externalisierender Verhaltensauffälligkeiten gibt es in Deutschland noch kaum populationsbasierte Daten. Ziel der vorliegenden Studie ist es, diese Lücke mit Hilfe der Daten einer bundesweiten, epidemiologischen Stichprobe zu schließen.

Die Fragestellungen dieser Studie lauten:

1. Wie häufig treten bei 12- bis 17-Jährigen mit externalisierenden Verhaltensauffälligkeiten riskanter Alkoholkonsum, illegaler Drogenkonsum, Delinquenz, Gewaltbereitschaft und finanzielle Probleme im frühen Erwachsenenalter auf?
2. Wie hoch ist das Risiko bei betroffenen Kindern und Jugendlichen im Vergleich zu nicht Betroffenen, im frühen Erwachsenenalter diese Langzeitfolgen zu entwickeln?
3. Welche Rolle spielen dabei Alter, Geschlecht, sozioökonomischer Status und internalisierende Auffälligkeiten?

Methoden

Studie und Durchführung

Die Analysen beruhen auf Daten der Befragung zum seelischen Wohlbefinden und Verhalten (BELLA-Studie). Das Studiendesign und die Studiendurchführung der BELLA-Kohortenstudie sind bei Ravens-Sieberer, Klasen und Petermann (2016) beschrieben.

Stichprobe

Für die vorliegende Studie konnten die Daten von $N = 629$ Kindern und Jugendlichen, die sowohl an der Basiserhebung der BELLA-Studie wie auch sechs Jahre später an der dritten Folgeunteruntersuchung teilgenommen hatten, herangezogen werden. Insgesamt nahmen 49.9 % aller Teilnehmenden der Basiserhebung sechs Jahre später wieder an der Studie teil. Detailliertere Informationen zur BELLA-Kohorte und zur Drop-out-Rate über die verschiedenen Erhebungszeitpunkte hinweg sind bei Ravens-Sieberer und Kollegen beschrieben (Ravens-Sieberer et al., 2014). Die vorliegende Stichprobe umfasst Kinder und Jugendliche, die zur Basiserhebung 12 bis 17 Jahren alt waren. Etwas mehr als die Hälfte waren Mädchen ($n = 345$, 54.8 %). Der Altersdurchschnitt lag bei $M = 14.3$ Jahren ($SD = 1.69$ Jahre).

Erhebungsverfahren

Erhebungsverfahren aus der Basiserhebung (Teilnehmende 12 bis 17 Jahre alt)

Zur Erfassung externalisierender Verhaltensauffälligkeiten sowie internalisierender Auffälligkeiten wurde der Strengths and Difficulties Questionnaire (SDQ, Goodman, 1997) in der deutschen Übersetzung (Klasen et al., 2000) im Selbsturteil herangezogen. Der SDQ besteht aus 25 Items die sich auf die letzten sechs Monate beziehen und vier Problemskalen sowie einer Skala zu *prosozialem Verhalten* zugeordnet sind. Die für die vorliegende Studie relevante Falldefinition für externalisierende Verhaltensauffälligkeiten und internalisierende Auffälligkeiten lehnt sich an die von Goodman, Lamping und Ploubidis (2010) publizierte Einteilung in externalisierende und internalisierende Auffälligkeiten an, deren Anwendung die Autoren insbesondere bei epidemiologischen Stichproben empfehlen (Goodman et al., 2010). Für die bivariaten Analysen wurden alle Werte der Problemskalen *Verhaltensprobleme* und *Hyperaktivität/Unaufmerksamkeit*, die als *grenzwertig* oder *auffällig* eingestuft werden, in eine dichotome Variable externalisierende Verhaltensauffälligkeiten integriert. Analog dazu wurden alle Werte der Problemskalen *emotionale Probleme* und *Probleme mit Gleichaltrigen*, die als *grenzwertig* oder *auffällig* eingestuft werden, in eine dichotome Variable internalisierende Auffälligkeiten integriert. Für die multivariaten Analysen

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wurden die Summenwerte der zwei jeweiligen Unterskalen gemittelt und die metrischen Skalen externalisierende Verhaltensauffälligkeiten und internalisierende Auffälligkeiten gebildet.

Erhebungsverfahren zum Messzeitpunkt sechs Jahre später (Teilnehmende 18 bis 23 Jahre alt)

Riskanter Alkoholkonsum wurde mit Hilfe des Alcohol Use Disorder Identification Test (AUDIT) im Selbsturteil gemessen. Der AUDIT ist ein von der WHO entwickeltes Screening zu riskantem und schädlichem Trinkverhalten (Babor, 2011), das international standardisiert wurde und in diversen Settings für unterschiedliche Zielgruppen eingesetzt werden kann. Für die vorliegende Studie wurden die drei Items aus dem Teilbereich zu *riskantem Alkoholgebrauch* (AUDIT-C) ausgewertet. Häufigkeit und Menge des Alkoholkonsums wurden mit den Items „Wie oft nehmen Sie ein alkoholisches Getränk, also z. B. ein Glas Wein, Bier, Mixgetränke, Schnaps oder Likör, zu sich?“ und „Wenn Sie Alkohol trinken, wie viele alkoholische Getränke trinken Sie dann üblicherweise an einem Tag?“ erfragt. Exzessives Trinkverhalten wurde durch das Item „Wie oft trinken Sie sechs oder mehr alkoholische Getränke bei einer Gelegenheit, z. B. auf einer Party?“ operationalisiert. Zur Erfassung riskanten Alkoholkonsums wurde eine dichotome Variable erstellt, die alle Teilnehmenden, deren Summenwert des AUDIT-C ins oberste Quartil fiel, positiv kodiert.

Illegaler Drogenkonsum wurde mit Hilfe von neun Items aus der Europäischen Schülerstudie zu Alkohol und anderen Drogen (ESPAD) operationalisiert (Hibell et al., 2009; Kraus, Pabst & Steiner, 2008). Acht Items im dichotomen Antwortformat erfragten im Selbstbericht die Lebenszeitprävalenz der Einnahme verschiedener illegaler psychoaktiver Substanzen (Cannabis; LSD oder Drogenpilze; Partydrogen wie Ecstasy, Amphetamine, Speed oder Crystal; Kokain; Crack; Heroin), Schnüffelstoffen (wie Leim oder Lösungsmittel), und verschreibungspflichtigen Medikamenten (wie Benzodiazepine, Antidepressiva, Neuroleptika). Ein weiteres Item erfasste die Häufigkeit des Cannabiskonsums pro Jahr. Zur Erfassung illegalen Drogenkonsums wurde eine dichotome Variable erstellt, die alle Teilnehmenden, die mindestens 40 Mal pro Jahr Cannabis und zusätzlich mindestens eine weitere illegale psychoaktive Substanz in ihrem Leben konsumiert hatten, positiv kodiert.

Delinquenz wurde mit Hilfe dreier, ebenfalls aus dem ESPAD Fragebogen stammender Items erfasst. Die Teilnehmenden wurden gefragt, ob sie schon einmal Ärger mit der Polizei gehabt hätten, ob sie schon einmal in einem Gerichtsverfahren beschuldigt worden seien und ob sie schon einmal Strafstunden abarbeiten mussten oder in Jugendarrest, im Jugendgefängnis oder in Untersuchungshaft gewesen waren. Diese Fragen konnten auf einer 4-stufigen Skala (von *trifft überhaupt nicht zu* bis *trifft genau zu*) beantwortet werden. Zur Bildung einer dichotomen Variable zur Erfassung von Delinquenz wurden alle Teilnehmenden, die mindestens eine der drei Fragen affirmativ (*trifft eher zu* oder *trifft genau zu*) beantwortet hatten, positiv kodiert.

Mit einer Skala von sechs Items wurde Gewaltbereitschaft erhoben (Schlack & Hölling, 2007; Schlack, Hölling, Erhart, Petermann & Ravens-Sieberer, 2010). Aussagen wie „Um mich durchzusetzen, muss ich manchmal auch gewalttätig werden.“ oder „Wenn mich jemand persönlich beleidigt, kann es ihm passieren, dass er sich eine fängt.“ wurden von den Teilnehmenden auf einer 4-stufigen Skala von *trifft überhaupt nicht zu* bis *trifft genau zu* beantwortet. Zur Erfassung von Gewaltbereitschaft wurde eine dichotome Variable erstellt, wobei alle Teilnehmenden, deren Gesamtwert ins oberste Quartil fiel, positiv kodiert wurden.

Finanzielle Probleme wurden anhand von vier Items, die das Vorhandensein von Schulden erfragen, operationalisiert. Die Teilnehmenden gaben an, ob sie Schulden bei Familienmitgliedern, Freunden oder Bekannten, wegen eines Kredits bei der Bank oder Sparkasse, bei anderen Institutionen (z. B. öffentliche Stellen, Telefongesellschaft, Versandhandel, Vermieter, Energieversorger) oder bei einem anderen Gläubiger haben. Zur Bildung einer dichotomen Variable zur Erfassung finanzieller Probleme wurden alle Teilnehmenden, die mindestens eines der vier Items bejahten, positiv kodiert.

Der sozioökonomische Status wurde durch den Winkler-Index (Winkler & Stolzenberg, 1999) erfasst. Dieser Index wird aus Angaben der Eltern zur schulischen und beruflichen Bildung, beruflicher Stellung und Haushaltsnettoeinkommen (Nettoeinkommen aller Haushaltsmitglieder nach Abzug der Steuern und Sozialabgaben) berechnet. Nach Winkler und Stolzenberg (1999) wurde eine Kategorisierung der Indexwerte in die drei Gruppen niedriger, mittlerer und hoher sozioökonomischer Status vorgenommen.

Statistische Analysen

Neben deskriptiven Berechnungen wie Häufigkeiten, Mittelwerte und Chi^2-Tests wurden für die Risikoberechnung der Langzeitfolgen externalisierender Verhaltensauffälligkeiten Odds Ratios und Konfidenzintervalle berechnet. Zur besseren Interpretation der Odds Ratios wurde das populationsbezogene attributable Risiko, in Prozent ausgedrückt (PAR%), herangezogen (Jekel, Katz, Elmore & Wild, 2007). Das PAR% sagt aus, um wie viel Prozent geringer die Inzidenz einer interessierenden Größe (hier: die Langzeitfolgen externalisierender Ver-

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haltensauffälligkeiten) wäre, wenn der Risikofaktor (hier: externalisierende Verhaltensauffälligkeiten) eliminiert würde (Jekel et al., 2007). Zur Analyse des multivariaten Zusammenhangs wurden multiple logistische Regressionen durchgeführt. Die einzelnen Langzeitfolgen wurden jeweils als abhängige Variable, externalisierende Verhaltensauffälligkeiten jeweils als unabhängige Variable und Alter, Geschlecht, sozioökonomischer Status sowie internalisierende Auffälligkeiten jeweils als zusätzliche Prädiktoren eingesetzt. Fehlende Werte wurden mit Hilfe des Expectation-Maximization-Algorithmus ersetzt. Alle Analysen wurden mit Hilfe des Softwarepakets IBM SPSS Version 22.0 durchgeführt (IBM Corp, 2013).

Ergebnisse

Tabelle 1 beschreibt die Stichprobe zur Basiserhebung. Es sind auch die Ausprägungen in den vier einzelnen SDQ-Problemskalen dargestellt. Insgesamt zeigten 18.4 % (n = 116) der Kinder und Jugendlichen grenzwertige oder auffällige Ausprägungen in einer oder in beiden Problemskalen externalisierender Verhaltensauffälligkeiten. Sechs Prozent (n = 38) der Kinder und Jugendlichen waren komorbid auffällig, d. h. sie wiesen gleichzeitig grenzwertige oder auffällige Ausprägungen in jeweils mindestens einer der jeweils zwei Problemskalen externalisierender Verhaltensauffälligkeiten und internalisierender Auffälligkeiten auf. Von den Teilnehmenden mit externalisierenden Verhaltensauffälligkeiten waren 48.3 % (n = 56) Mädchen; ein Fünftel (20.7 %, n = 24) wies einen niedrigen, etwas mehr als die Hälfte (53.4 %, n = 62) einen mittleren und 25.9 % (n = 30) einen hohen sozioökonomischen Status auf. Sechs Jahre später zeigte ein Fünftel (20.8 %, n = 131) aller Teilnehmenden riskanten Alkoholkonsum und 7.9 % (n = 50) konsumierten illegale Drogen. Insgesamt 11.1 % (n = 70) der Teilnehmenden wiesen Delinquenz auf, jeweils etwa ein Viertel Gewaltbereitschaft (26.4 %, n = 166), beziehungsweise finanzielle Probleme (24.3 %, n = 153).

Tabelle 2 stellt die Häufigkeiten der Langzeitfolgen externalisierender Verhaltensauffälligkeiten sowie das PAR% dar. Kinder und Jugendliche mit externalisierenden Verhaltensauffälligkeiten wiesen sechs Jahre später signifikant häufiger riskanten Alkoholkonsum, illegalen Drogenkonsum, Delinquenz und Gewaltbereitschaft auf als Kinder und Jugendliche ohne externalisierende Verhaltensauffälligkeiten. Kein Unterschied konnte bei finanziellen Problemen beobachtet werden. Die bivariaten Analysen zeigten weiterhin, dass Kinder und Jugendliche mit externalisierenden Verhaltensauffälligkeiten ein 1.6-faches Risiko aufweisen, sechs Jahre später riskanten Alkoholkonsum zu zeigen. Das Risiko, Problemverhalten in Form illegalen Drogenkonsums, Delinquenz oder Ge-

Tabelle 1. Beschreibung der Stichprobe zur Basiserhebung

		***N* = 629** ***n* (%)**
Geschlecht		
	Mädchen	345 (54.8)
	Jungen	284 (45.2)
SES[1]		
	Niedrig	114 (18.1)
	Mittel	305 (48.5)
	Hoch	210 (33.4)
Alter		
	12 Jahre alt	118 (18.8)
	13 Jahre alt	121 (19.2)
	14 Jahre alt	100 (15.9)
	15 Jahre alt	105 (16.7)
	16 Jahre alt	101 (16.1)
	17 Jahre alt	84 (13.4)
Psychische Auffälligkeiten[2]		
Emotionale Probleme	unauffällig	570 (90.6)
	grenzwertig	23 (3.7)
	auffällig	36 (5.7)
Probleme mit Gleichaltrigen	unauffällig	533 (84.7)
	grenzwertig	74 (11.8)
	auffällig	22 (3.5)
Verhaltensprobleme	unauffällig	565 (89.8)
	grenzwertig	35 (5.6)
	auffällig	29 (4.6)
Hyperaktivität	unauffällig	554 (88.1)
	grenzwertig	38 (6.0)
	auffällig	37 (5.9)
Internalisierend[3]		
	grenzwertig oder auffällig	131 (20.8)
Externalisierend[4]		
	grenzwertig oder auffällig	116 (18.4)
Komorbid[5]		
	internalisierend und externalisierend	38 (6.0)

Anmerkungen: [1]SES = Sozioökonomischer Status, gemessen anhand des Winkler-Indexes (Winkler & Stolzenberg, 1999). [2]Psychische Auffälligkeiten = gemessen anhand der SDQ Problemskalen (Goodman, 1997). [3]Internalisierende Auffälligkeiten = alle Fälle mit der Ausprägung *grenzwertig* oder *auffällig* einer oder beider SDQ Problemskalen *emotionale Probleme* und *Probleme mit Gleichaltrigen.* [4]Externalisierende Verhaltensauffälligkeiten = alle Fälle mit der Ausprägung *grenzwertig* oder *auffällig* einer oder beider SDQ Problemskalen *Verhaltensprobleme* und *Hyperaktivität/Unaufmerksamkeit.* [5]Komorbide externalisierende Verhaltensauffälligkeiten und internalisierende Auffälligkeiten: alle Fälle mit der Ausprägung *grenzwertig* oder *auffällig* der zwei dichotomen Skalen *internalisierende* und *externalisierende Auffälligkeiten.*

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waltbereitschaft zu zeigen, war mindestens 2-fach erhöht. Die Berechnung des PAR% zeigte, dass bei einer (hypothetisch vollständigen) Reduzierung externalisierender Verhaltensauffälligkeiten die Prävalenz von Risikoverhaltensweisen im Erwachsenenalter um bis zu einem Sechstel zurückgehen würde.

Tabelle 3 stellt die Ergebnisse der multivariaten Regressionen dar. Kinder und Jugendliche mit externalisierenden Verhaltensauffälligkeiten wiesen nach Kontrolle von Alter, Geschlecht, sozioökonomischen Status und internalisierenden Auffälligkeiten ein erhöhtes Risiko für riskanten Alkoholkonsum, illegalen Drogenkonsum und insbesondere für Delinquenz und Gewaltbereitschaft im frühen Erwachsenenalter auf. Die Interaktion zwischen Geschlecht und externalisierenden Verhaltensauffälligkeiten wurde überprüft und wurde nicht signifikant. Wie bei den bivariaten Analysen waren externalisierende Verhaltensauffälligkeiten nicht mit finanziellen Problemen im Erwachsenenalter verbunden. Jungen waren zudem einem deutlich höheren Risiko ausgesetzt, später riskanten Alkoholkonsum, Delinquenz und Gewaltbereitschaft aufzuweisen als Mädchen. Ein höherer sozioökonomischer Status bedeutete eine Risikoreduktion für späteren riskanten Alkoholkonsum, Delinquenz, Gewaltbereitschaft und finanzielle Probleme. Außerdem zeigte sich, dass internalisierende Auffälligkeiten in einem inversen Zusammenhang mit riskantem Alkoholkonsum und Delinquenz im Erwachsenenalter standen.

Diskussion

Die Hauptergebnisse der Studie belegen, dass Kinder und Jugendliche mit externalisierenden Verhaltensauffälligkeiten bis zu zweimal häufiger riskanten Alkoholkonsum, illegalen Drogenkonsum, Delinquenz und Gewaltbereitschaft im frühen Erwachsenenalter aufweisen als solche ohne externalisierende Verhaltensauffälligkeiten. Ihr Risiko, im jungen Erwachsenenalter riskanten Alkoholkonsum, Delinquenz und Gewaltbereitschaft als Langzeitfolgen zu entwickeln, bleibt auch nach Kontrolle von Alter, Geschlecht und sozioökomischen Status erhöht.

Der Zusammenhang zwischen externalisierenden Verhaltensauffälligkeiten und späterem riskanten Alkoholkonsum war signifikant, aber von geringer Effektstärke. Colman und Kollegen (2009) berichten auf der Basis der British Cohort Study von höheren Effektstärken, obwohl das Messintervall mit einem zeitlichen Abstand von 30 bis 40 Jahren wesentlich größer ist als in der vorliegende Studie. Colman und Kollegen untersuchten jedoch den Zusammenhang zwischen externalisierenden Verhaltens-

Tabelle 2. Häufigkeit, Odds Ratio und populationsbezogenes attributables Risiko für Langzeitfolgen von Kindern und Jugendlichen mit und ohne vorangegangene externalisierende Verhaltensauffälligkeiten

	Riskanter Alkoholkonsum		Illegaler Drogenkonsum		Delinquenz		Gewaltbereitschaft		Finanzielle Probleme	
	Ja	Nein	Ja	Nein	Ja	Nein	Ja	Nein	Ja	Nein
Externalisierende Verhaltensauffälligkeiten	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Ja ($n = 116$)	32 (27.6)	84 (72.4)	16 (13.8)	100 (86.2)	22 (19.0)	94 (81.0)	48 (41.4)	68 (58.6)	34 (29.3)	82 (70.7)
Nein ($n = 513$)	99 (19.3)	414 (80.7)	34 (6.6)	479 (93.4)	48 (9.4)	465 (90.6)	118 (23.0)	395 (77.0)	119 (23.2)	394 (76.8)
OR [95 %iges KI]	1.60* [1.00 – 2.53]		2.25* [1.20 – 4.24]		2.27** [1.31 – 3.93]		2.36*** [1.55 – 3.61]		1.37 [0.88 – 2.15]	
PAR%	7.2		16.5		15.3		12.9		4.5	

Anmerkungen: Externalisierende Verhaltensauffälligkeiten = alle Fälle mit der Ausprägung *grenzwertig* oder *auffällig* einer oder beider SDQ-Problemskalen *Verhaltensprobleme* und *Hyperaktivität/Unaufmerksamkeit*. OR = Odds Ratio; KI = Konfidenzintervall; PAR% = populationbezogenes attributables Risiko in Prozent ausgedrückt. ***$p < .001$; **$p < .01$; *$p < .05$.

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Tabelle 3. Multivariate logistische Regressionen zur Vorhersage verschiedener Langzeitfolgen im jungen Erwachsenenalter

	B	SE	OR	95%iges KI
Riskanter Alkoholkonsum				
Alter	-.06	.06	0.94	[0.83 – 1.06]
Geschlecht	**1.29**	**.22**	**3.64*** **	**[2.35 – 5.64]**
SES	**-.06**	**.03**	**0.95***	**[0.90 – 0.99]**
Internalisierende Auffälligkeiten	**-.21**	**.08**	**0.81***	**[0.69 – 0.95]**
Externalisierende Verhaltensauffälligkeiten	**.22**	**.08**	**1.25*** **	**[1.07 – 1.46]**
	Modellgüte: $X^2(5, N = 629) = 65.457$, $p = .000$, Nagelkerke $R^2 = 15.4\%$.			
Illegaler Drogenkonsum				
Alter	.12	.09	1.13	[0.95 – 1.35]
Geschlecht	.46	.31	1.58	[0.86 – 2.91]
SES	-.03	.04	0.97	[0.90 – 1.04]
Internalisierende Auffälligkeiten	.07	.10	1.07	[0.88 – 1.30]
Externalisierende Verhaltensauffälligkeiten	**.28**	**.111**	**1.32***	**[1.06 – 1.64]**
	Modellgüte: $X^2(5, N = 629) = 12.904$, $p = .024$, Nagelkerke $R^2 = 4.8\%$.			
Delinquenz				
Alter	-.01	.08	0.99	[0.84 – 1.16]
Geschlecht	**1.44**	**.31**	**4.22*** **	**[2.31 – 7.73]**
SES	**-.16**	**.04**	**0.85*** **	**[0.80 – 0.91]**
Internalisierende Auffälligkeiten	**-.23**	**.11**	**0.79***	**[0.64 – 0.98]**
Externalisierende Verhaltensauffälligkeiten	**.40**	**.10**	**1.49*** **	**[1.22 – 1.82]**
	Modellgüte: $X^2(5, N = 629) = 69.504$, $p = .000$, Nagelkerke $R^2 = 20.8\%$.			
Gewaltbereitschaft				
Alter	-.04	.08	0.96	[0.86 – 1.08]
Geschlecht	**1.63**	**.21**	**5.12*** **	**[3.37 – 7.78]**
SES	**-.08**	**.02**	**0.92****	**[0.88 – 0.97]**
Internalisierende Auffälligkeiten	-.12	.08	0.88	[0.76 – 1.02]
Externalisierende Verhaltensauffälligkeiten	**.34**	**.08**	**1.41*** **	**[1.21 – 1.64]**
	Modellgüte: $X^2(5, N = 629) = 107.947$, $p = .000$, Nagelkerke $R^2 = 23.0\%$.			
Finanzielle Probleme				
Alter	**.22**	**.06**	**1.24*** **	**[1.11 – 1.39]**
Geschlecht	-.08	.20	0.92	[0.62 – 1.36]
SES	**-.08**	**.02**	**0.92****	**[0.88 – 0.97]**
Internalisierende Auffälligkeiten	.04	.07	1.04	[0.92 – 1.19]
Externalisierende Verhaltensauffälligkeiten	.11	.07	1.11	[0.96 – 1.29]
	Modellgüte: $X^2(5, N = 629) = 31.929$, $p = .000$, Nagelkerke $R^2 = 7.4\%$.			

Anmerkungen: SES = sozioökonomischer Status. Internalisierende Auffälligkeiten = alle Fälle mit der Ausprägung *grenzwertig* oder *auffällig* einer oder beider SDQ-Problemskalen *emotionale Probleme* und *Probleme mit Gleichaltrigen.* Externalisierende Verhaltensauffälligkeiten = alle Fälle mit der Ausprägung *grenzwertig* oder *auffällig* einer oder beider SDQ-Problemskalen *Verhaltensprobleme* und *Hyperaktivität/Unaufmerksamkeit.* Signifikante Prädiktoren sind **fett** markiert. ***$p < .001$; **$p < .01$; *$p < .05$.

auffälligkeiten und Alkoholmissbrauch. In der vorliegenden Studie handelt es sich um ein Screening für riskanten Alkoholkonsum.

Besonders deutlich war der Zusammenhang zwischen externalisierenden Verhaltensauffälligkeiten und Delinquenz. Auch in der Literatur wird der Zusammenhang

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zwischen externalisierenden Verhaltensauffälligkeiten und späterer Delinquenz als besonders ausgeprägt beschrieben (Aebi, Giger, Plattner, Metzke & Steinhausen, 2014; Petermann & Brettfeld, 2014; Witthöft, Koglin & Petermann, 2011).

Es konnte kein Zusammenhang zwischen externalisierenden Verhaltensauffälligkeiten und späteren finanziellen Problemen beobachtet werden. Dies steht im Widerspruch zu den Befunden der neuseeländischen Kohortenstudien (Fergusson et al., 2013; Moffitt et al., 2011), die von klaren Zusammenhängen zwischen externalisierenden Verhaltensauffälligkeiten und späteren armutsbezogenen Parametern berichten. Mögliche Ursachen hierfür könnten die in der vorliegenden Studie eher weiche Operationalisierung finanzieller Probleme sowie das im Vergleich zu den anderen Kohortenstudien noch junge Alter der Teilnehmenden zum zweiten Messzeitpunkt sein.

Die Analysen ergaben weiterhin, dass Jungen einem weitaus größeren Risiko ausgesetzt sind, im frühen Erwachsenalter Risikoverhaltensweisen in Form von riskantem Alkoholkonsum, Delinquenz und Gewaltbereitschaft zu zeigen als Mädchen. Ähnliche Ergebnisse berichten auch Fergusson und Kollegen (2013) mit Daten der Christchurch Health and Development Study. Weiterhin war ein niedrigerer sozioökonomischer Status mit einem erhöhten Risiko für riskanten Alkoholkonsum, Delinquenz, Gewaltbereitschaft und finanzielle Probleme verbunden, wie es auch schon Toumbourou und Kollegen (2007) und Fergusson und Kollegen (2013) berichten. Außerdem zeigt die vorliegende Studie, dass internalisierende Auffälligkeiten späteres Risikoverhalten unterbinden können. Dieser Effekt war sowohl bei riskantem Alkoholkonsum wie auch bei Delinquenz zu beobachten. Auch hier entsprechen die vorliegenden Ergebnisse früheren Längsschnittstudien (Colder et al., 2013; Fite et al., 2006) und lassen sich durch den mit internalisierenden Auffälligkeiten verbundenen sozialen Rückzug erklären (Fite et al., 2006).

Die Bedeutung externalisierender Verhaltensauffälligkeiten für die Entwicklung von Langzeitfolgen im jungen Erwachsenenalter erschließt sich nicht zuletzt auch aus der Berechnung des PAR%: Die Prävalenz der untersuchten Langzeitfolgen könnte theoretisch, bei vollständiger Eliminierung externalisierender Verhaltensauffälligkeiten, in dieser Stichprobe um bis zu 16.5 % gesenkt werden.

Insgesamt unterstützen die vorliegenden Befunde aus der BELLA-Studie, die auch durch die Ergebnisse früherer Längsschnittstudien bestätigt werden, das Modell externalisierender Entwicklungspfade. Um den mit externalisierenden Verhaltensauffälligkeiten verbundenen, negativen Auswirkungen auf den weiteren Lebensverlauf entgegenzuwirken, sollte Kindern und Jugendlichen ein frühzeitiger Zugang zu Präventionsmaßnahmen ermöglicht werden (Petermann & Lehmkuhl, 2010).

Mit der vorliegenden Studie wurden zum ersten Mal in Deutschland die Langzeitfolgen externalisierender Verhaltensauffälligkeiten anhand populationsbasierter Längsschnittdaten untersucht. Die Ergebnisse stützen sich auf Daten, die im Selbsturteil erhoben worden sind. Für ein vollständigeres Bild sollten zukünftige Arbeiten Fremdurteile mit einbeziehen. Außerdem sollte die Verwendung von standardisierten Erhebungsverfahren zur Messung von Langzeitfolgen bevorzugt werden, was in der vorliegenden Studie auf Grund des Studiendesigns nicht durchgehend möglich war. Ferner wurden externalisierende Verhaltensauffälligkeiten mit Hilfe von Erhebungsverfahren im Fragebogenformat erhoben, es wurden keine diagnostischen Interviews durchgeführt. Zukünftige Arbeiten sollten untersuchen, inwieweit sich junge Erwachsene, die seit ihrer Kindheit externalisierende Verhaltensauffälligkeiten zeigen, sich in den Langzeitfolgen von den jungen Erwachsenen, deren Verhalten nur vorübergehend auffällig war, unterscheiden. Aufgrund fehlender Passung der Erhebungsverfahren im Übergang zwischen Jugend- und Erwachsenenalter war dies in dieser Studie nicht möglich. Obwohl die Langzeitfolgen nur global und die externalisierenden Verhaltensauffälligkeiten durch ein Screening-Verfahren erfasst wurden, lassen die Ergebnisse über den Verlauf von sechs Jahren deutliche Effekte sichtbar werden. Wir erwarten, dass die Verwendung standardisierter Verfahren und diagnostischer Interviews die vorliegenden Befunde bestätigen würden.

Schlussfolgerungen für die klinische Praxis

Die auf Daten einer bevölkerungsbasierten Stichprobe von 12- bis 17-Jährigen beruhenden Analysen zeigen, dass insbesondere Jungen aus Familien mit niedrigem sozioökonomischem Status und externalisierenden Verhaltensauffälligkeiten ein um bis zu anderthalbfach erhöhtes Risiko aufweisen, im frühen Erwachsenenalter übermäßig oft und viel Alkohol zu trinken, polizeilich bekannt zu werden und Gewalt anzuwenden. Die betroffenen Kinder und Jugendlichen sind unruhig, leicht ablenkbar, aufbrausend, wenig folgsam, lügen und stehlen oder streiten sich oft. Ebenso haben Mädchen und Jungen mit externalisierenden Verhaltensauffälligkeiten gleichermaßen ein um 1.3-fach erhöhtes Risiko, im frühen Erwachsenenalter regelmäßig Cannabis zu konsumieren und Bekanntschaft mit weiteren, härteren Drogen und Schnüffelstoffen zu machen beziehungsweise Medikamente zu miss-

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brauchen. Bis zu 16.5 % der untersuchten Risikoverhaltensweisen im Erwachsenenalter sind außerdem dem Vorkommen externalisierender Verhaltensauffälligkeiten in der Kindheit und Jugend geschuldet. Die erzielten Ergebnisse verdeutlichen, dass sozial-emotionale Fertigkeiten risikobelasteter Kinder gefördert und Präventionsprogramme dementsprechend gestaltet werden sollten (vgl. z. B. Lohbeck, Petermann & Petermann, 2014).

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Conclusions

Publication 4 underscores the negative development pathways associated with externalising mental health problems. It highlights that, in young adulthood, risky behaviours – such as substance use, delinquency, and a tendency toward violence – are significantly more prevalent among those who reported externalising mental health problems during adolescence compared to their peers who did not report externalising mental health. The results further indicate that males, in particular, represent a high-risk subgroup. These findings are particularly relevant because they underscore how early behavioural difficulties can have far-reaching implications later in life. Furthermore, it highlights the harmful cycle that externalising mental health problems can initiate, as proposed by Serbin and Karp (2004) and demonstrated by De Genna et al., (2006), emphasising the intergenerational continuity of mental health issues particularly with regards to behaviour related to externalising mental health problems.

While the prevention of mental health problems and the disruption of their adverse cyclical effects in children and adolescents remain essential objectives, these efforts alone are insufficient. Equally important is the active promotion of positive health outcomes in this population. This approach aligns with the WHO's definition of health (see Chapter 2.3.1). Furthermore, research on HRQoL reinforces this perspective by emphasising the importance of enhancing the individuals' overall well-being, rather than focusing solely on symptom reduction (see Chapters 2.3.1, 2.4.2, and 2.6.5 of this thesis).

Publication 5 therefore investigates risk and protective factors of HRQoL in children and adolescents. Specifically, it analyses the effect of parental mental health problems and child and adolescent mental health problems on HRQoL over time and examines whether protective factors may buffer against these risk factors and/or contribute to increased HRQoL.

5.5. Parental and Child and Adolescent Mental Health Problems and Protective Factors Affecting Child and Adolescent HRQoL Over Time

Publication 5

Otto, C.*, **Haller, A-C.***, Barkmann, C., Klasen, F., & Ravens-Sieberer, U. (2017). Risk and protective factors of health-related quality of life in children and adolescents: Results of the longitudinal BELLA study. *PLOS ONE, 12*(12), e0190363. https://doi.org/10.1371/journal.pone.0190363

Overview

This publication investigates risk and protective factors influencing HRQoL in children and adolescents over time, utilising longitudinal data from the German BELLA study. The research aims to understand how risk factors (parental mental health problems, child and adolescent mental health problems) and protective factors (self-efficacy, family climate, social support) affect HRQoL over time in a population-based sample.

Research Questions

5.1 Which selected risk and protective factors are associated with HRQoL in children and adolescents at baseline?

5.2 How do these risk and protective factors influence changes in HRQoL over time?

5.3 Do these selected protective factors (i.e., self-efficacy, family climate, and social support) moderate the relationship between the selected risk factors (mental health problems, parental mental health problems) and HRQoL?

Sample

Data from *N* = 1554 children and adolescents aged 11 to 17 years at baseline were collected at three time points (baseline, 1-year follow-up, and 2-year follow-up). About half (51%) of the participants were female, the mean age was 13.9 years (*SD* = 2.97). At baseline, 8 % of the participants reported low HRQoL, 77% reported moderate HRQoL, 15 % reported high HRQoL as measured by the KIDSCREEN-10-Index. Furthermore, 11% of the children and adolescents reported mental health problems (SDQ scores *borderline* and *abnormal*) and 8% of the children and adolescents had parents with mental health problems.

Results

At the baseline assessment, girls reported lower HRQoL than boys, particularly among older individuals. Lower SES and migration background were also associated with lower HRQoL. Mental health problems in both children and adolescents and their parents were negatively associated with HRQoL, while higher self-efficacy, positive family climate, and strong social support were associated with higher HRQoL. Over time, HRQoL increased less in girls compared to boys, especially among younger participants. Improvements in self-efficacy and social support were positively associated with increases in HRQoL, whereas worsening mental

health problems in children and adolescents were associated with declines in HRQoL. Notably, changes in parental mental health and family climate did not significantly affect HRQoL over time. Regarding moderation effects, no evidence was found that the protective factors self-efficacy, family climate, or social support moderated the relationship between the risk factors and HRQoL.

Publication 5

Otto, C.*, **Haller, A-C.***, Barkmann, C., Klasen, F., & Ravens-Sieberer, U. (2017). Risk and protective factors of health-related quality of life in children and adolescents: Results of the longitudinal BELLA study. *PLOS ONE, 12*(12), e0190363. https://doi.org/10.1371/journal.pone.0190363

PLOS ONE

RESEARCH ARTICLE

Risk and protective factors of health-related quality of life in children and adolescents: Results of the longitudinal BELLA study

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Abstract

Aims

Cross-sectional studies demonstrated associations of several sociodemographic and psychosocial factors with generic health-related quality of life (HRQoL) in children and adolescents. However, little is known about factors affecting the change in child and adolescent HRQoL over time. This study investigates potential psychosocial risk and protective factors of child and adolescent HRQoL based on longitudinal data of a German population-based study.

Methods

Data from the BELLA study gathered at three measurement points (baseline, 1-year and 2-year follow-ups) were investigated in $n = 1,554$ children and adolescents aged 11 to 17 years at baseline. Self-reported HRQoL was assessed by the KIDSCREEN-10 Index. We examined effects of sociodemographic factors, mental health problems, parental mental health problems, as well as potential personal, familial, and social protective factors on child and adolescent HRQoL at baseline as well as over time using longitudinal growth modeling.

Results

At baseline, girls reported lower HRQoL than boys, especially in older participants; low socioeconomic status and migration background were both associated with low HRQoL. Mental health problems as well as parental mental health problems were negatively, self-efficacy, family climate, and social support were positively associated with initial HRQoL. Longitudinal analyses revealed less increase of HRQoL in girls than boys, especially in younger participants. Changes in mental health problems were negatively, changes in self-efficacy and social support were positively associated with the change in HRQoL over time. No effects were found for changes in parental mental health problems or in family climate on

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changes in HRQoL. Moderating effects for self-efficacy, family climate or social support on the relationships between the investigated risk factors and HRQoL were not found.

Conclusion

The risk factor mental health problems negatively and the resource factors self-efficacy and social support positively affect the development of HRQoL in young people, and should be considered in prevention programs.

Introduction

Health-related quality of life (HRQoL) is a subjective and multidimensional construct that includes physiological, psychological, and functional aspects of health and wellbeing [1]. Generic HRQoL in children and adolescents includes dimensions specifically related to the children's and the adolescents' experience and environment, such as physical and psychological wellbeing, family life, school environment, and peer relations [2]. HRQoL has become a major health outcome in epidemiological research on children and adolescents [3, 4]. Identifying the factors that affect child and adolescent HRQoL can provide important information for policy makers, can help to develop effective prevention programs for children and adolescents [5], and will thereby promote and enable positive mental and physical health and well-being in the long term [6, 7].

A number of standardized age-appropriate measures are available to measure HRQoL in children and adolescents [8, 9]. HRQoL is a subjective perception, it is therefore best assessed by means of self-reports [10, 11], as long as the measures are age-appropriate [9, 10, 12]. Parent- and proxy-reports may be gathered in addition, or if the children are very young or suffer from very severe health conditions [8, 9, 11].

In recent years, research in public health has increasingly been influenced by the concept of risk and protective factors and their effects on mental health and well-being [13–15]. Whereas risk factors increase the probability of occurrence of a negative health outcome, protective factors in contrary decrease the probability of undesirable outcomes or increase the probability of positive development of the outcome of interest [16]. Within this theoretical framework, more complex interactions are possible, with protective factors for instance moderating the detrimental effect of risk factors on the outcome of interest [16–18]. To our knowledge, the concept of risk and protective factors has to date only been applied to child and adolescent HRQoL in studies on clinical samples using cross-sectional data (e.g., in children with chronic health conditions [19]).

Sociodemographic factors associated with child and adolescent HRQoL have been investigated in numerous population- or school-based cross-sectional studies. Analyses from data of large surveys such as the European KIDSCREEN study (n = 21,590) show that general HRQoL was higher in younger compared with older participants [20]. Furthermore, with increasing age, girls reported lower HRQoL than boys; this gender-specific difference was more pronounced in older compared with younger children and adolescents in the investigated sample [20]. In a population-based study conducted in seven European countries, higher parental education, better work status, and higher family wealth were associated with higher HRQoL in children and adolescents (n = 1,896 aged 8 to 18 years) [21]. Similarly, findings of the international study on Health Behavior of School-aged Children (HBSC study) based on European

data from 15 countries (n = 78,000 pupils aged 11, 13, and 15 years) showed that the family's socioeconomic status was positively associated with the pupils' HRQoL [22].

Concerning associations of mental health and HRQoL in children and adolescents, research based on a large European cross-sectional, population-based sample of almost 16,000 children and adolescents showed that child mental health problems were associated with lower HRQoL [23]. In line with these findings, Sharpe et al. [24], using data from a school-based study surveying 45,398 pupils aged 8 to 13 years in England, reported a strong link between mental health problems and HRQoL (group comparisons showed the highest HRQoL score for children with no mental health problems, and the lowest HRQoL score for those with both internalizing as well as externalizing mental health problems). Yet, the authors also found that 12% of the investigated children with mental health problems reported high HRQoL [24]. Further, parent-reported parental mental health problems have also been shown to be associated with lower HRQoL children and adolescents based on data of a Greek study (n = 1,194 children and adolescents aged 11 to 17 years) [25]. These findings are in line with a model on determinants of child and adolescent HRQoL developed by the KIDSCREEN group suggesting that HRQoL is associated not only with sociodemographic factors, but additionally with physical and mental health of the children and adolescents, with parental mental health, as well as with parent-child relationships [8].

Concerning psychosocial factors associated with child and adolescent HRQoL, the extensive body of literature on social support compiled over several decades has recognized the major influence social support has on mental health and well-being [26, 27]. Moreover, analyses based on baseline data of the German BELLA study of children and adolescents aged 7 to 17 years (N = 2,863) revealed that personal (i.e., self-efficacy, optimism, sense of coherence), familial (i.e., positive family climate), and social (i.e., social support) factors explained more than 50% of the variance of HRQoL [28]. Kvarme et al. [29] found positive associations between self-efficacy and HRQoL in a sample of 279 school children from 7th grade. A cross-sectional study using data of over 22,830 children and adolescents from 13 European countries found positive associations between parent-child relationship and social support and HRQoL [28]. Similarly, in their national sample of 3,195 Portuguese 5th and 7th grade pupils Gaspar et al. [30] found that self-esteem, optimism, and social support had a considerable positive impact on the pupils' HRQoL.

As far as we know, there has only been little research on the effects of factors on individual changes in child and adolescent HRQoL over time that go beyond sociodemographic data and include psychosocial factors. Based on longitudinal data of the population-based German BELLA study, Barkmann et al. [31] investigated five domains of HRQoL as measured by means of the KIDSCREEN-27 [8]. Barkmann et al. demonstrated that older age, female gender, lower socioeconomic status, and migration background were predictors of lower HRQoL in children and adolescents (n = 1,597 aged 11 to 17 years) [31]. The authors furthermore suggest that the age and gender differences in HRQoL may reflect hidden processes associated to puberty, the changes, and the developmental challenges related to this particular developmental period [31]. A negative association of a migration background and HRQoL was also found in a trend analysis using data of more than 10,000 Dutch children aged 4 to 11 years [5]. However, to our knowledge, there is no study that has looked at psychosocial risk as well as protective predictors of child and adolescent HRQoL based on longitudinal data.

The aims of this study are to examine the effects of selected psychosocial risk and protective factors on child and adolescent overall HRQoL in a German population-based sample of the longitudinal BELLA study initially (at baseline) as well as over a period of two years. We focused on overall HRQoL and controlled for effects of sociodemographic factors investigating effects of potential risk factors (i.e., mental health problems and parental mental health

problems) as well as protective factors (i.e., self-efficacy, positive family climate, and social support) on overall HRQoL cross-sectionally as well as longitudinally using self-reported data. We expected that mental health problems and parental mental health problems were negatively, and self-efficacy, positive family climate as well as social support were positively associated with initial HRQoL and with the change in HRQoL over time. Moreover, we expected that self-efficacy, family climate, and social support attenuate the relationship between the investigated risk factors (i.e., mental health problems and parental mental health problems) and HRQoL initially as well as over time.

Methods

Study design

The longitudinal BELLA study is the mental health module of the German National Health Interview and Examination Survey among Children and Adolescents (KiGGS study). The BELLA study gathers data on mental health and well-being of children and adolescents. The baseline assessment of the BELLA study took place between 2003 and 2006 with a number of 2,863 children and adolescents (aged 7 to 17 years) participating. Further measurement points were conducted in the BELLA study including a 1-year (2004 to 2007) and a 2-year follow-up (2005 to 2008). Data were collected by means of telephone interviews and subsequent questionnaires. Self-reported information of children and adolescents were gathered if participants were aged at least 11 years. Additionally, parent-reported data were gathered from one parent of each participant. Written informed consent was obtained from adolescents (aged at least 14 years) and from parents (for themselves as well as for their participating children younger than 14 years) at each measurement point. Approval for the BELLA study was obtained from the ethics committee of the Federal Commissioner for Data Protection in Germany. The BELLA study was performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. More details on the conceptualization, design, and methods of the BELLA study as well as the KiGGS study have been published [32, 33].

Participants

In the present study, we analyzed data from the first three measurement points of the BELLA study gathered over a period of two years (at baseline, 1-year, and 2-year follow-ups). To allow the inclusion of a participant in our analyses, data on age, gender, the socioeconomic status (SES), and migration background had to be available; further, valid data for at least one of the three investigated measurements points were necessary regarding HRQoL, mental health problems, parental mental health problems, self-efficacy, family climate, as well as social support. The final sample under analysis included 1,554 children and adolescents aged 11 to 17 years at baseline who had participated in at least one of the three consecutive measurement points of the BELLA study.

Measures

Sociodemographic variables. Age, gender, SES, and migration background were assessed at baseline. The SES was measured using the Winkler Index, a score that integrates information regarding the total household income as well as parental educational and occupational status [34] into one metric variable ranging from 3 to 21. In order to differentiate between participants, and only for sample description, the score of the Winkler-Index was categorized into groups with low (3 to 8 points), medium (9 to 14 points), and high SES (15 to 21 points) [35]. Further, the potential migration background of participants was assessed based on Schenk

[36]. Migration background was assumed if i) the child or adolescent had immigrated to Germany and had at least one parent foreign born or if ii) both parents of the participant immigrated to Germany or did not hold German citizenship.

Health-related quality of life. The self-report version of the KIDSCREEN-10 Index [8] was administered at each investigated measurement point of the BELLA study. The KIDSCREEN-10 Index provides a global HRQoL score covering physical, psychological, and social facets of HRQoL. It has good discriminatory power and its strong internal consistency (Cronbach's α = .82) as well as its test-retest reliability (Intra Class Correlation (*ICC*) = .70) as found in a large international sample allow precise and stable measurements [37]. The KIDSCREEN-10 Index includes ten items (e.g., "Have you felt fit and well?" or "Have you had enough time for yourself?") offered with 5-point response scales (0 = *not at all* to 4 = *extremely* or 0 = *never* to 4 = *always)*. For scoring, we recoded negatively phrased items and calculated the index score across all ten items as a mean score ranging from 0 to 4. Good internal consistency for the KIDSCREEN-10 Index was found in the present study (Cronbach's α ranged from .78 to .82 across the investigated measurement points). Solely for sample description, we calculated a T-score for the KIDSCREEN-10 Index based on European reference data [8]; by means of these T-scores (Mean (*M*) = 50; Standard Deviation (*SD*) = 10) participants were categorized into three groups with low (T-scores < 40), medium (T-scores ranging from 40 to 60) and high HRQoL (T-scores > 60) [38].

Mental health problems. Mental health problems (of children and adolescents) were assessed using the German self-report version of the Strengths and Difficulties Questionnaire (SDQ) [39] at each measurement point of the present study. The SDQ is a well-established, reliable, and valid measure to assess emotional and behavioral problems in the past six months. It includes four problem scales on emotional symptoms, conduct problems, hyperactivity/inattention, and peer problems consisting of five items each. SDQ items are offered with three response options (0 = *not true*, 1 = *somewhat true*, 2 = *certainly true*). The Total Difficulties Score of the SDQ can be calculated summarizing all 20 items of the four problem scales. In the present study, a mean was calculated for the Total Difficulties Score ranging from 0 to 2. Good internal consistency for the SDQ Total Difficulties Score was detected across the measurement points in the investigated sample (Cronbach's α ranged from .72 to .75). For descriptive purposes only we created two groups based on the Total Difficulties score differentiating children and adolescents with mental health problems (gathering SDQ categories *borderline* and *abnormal*) from those without mental health problems (SDQ category *normal)* using a published cut-off [40].

Parental mental health problems. The short form of the German version of the Symptom Checklist-90-R (SCL-90-R) [41], i.e., the SCL-S-9 [42] was administered to the participating parents at each measurement point of the study. By means of nine items, the SCL-S-9 measures mental health problems in the past seven days with regard to depression, anxiety, somatization, obsessive-compulsive symptoms, anger-hostility, interpersonal sensitivity, phobic anxiety, paranoid ideation, and psychoticism. The items of the SCL-S-9 are offered with a 5-point response scale (0 = *not at all* to 4 = *very much*). In the BELLA study, we gathered parent-reported information of one parent for each participating child or adolescent; the decision which parent participated was primarily based on availability or willingness. For 89% of the cases, the biological mother filled in the questionnaire, followed by the biological father with 10% of the cases; for the remaining 1% cases, the SCL-S-9 was filled in by other care-givers such as stepparents, grandparents or adoptive or fostering parents. For the analyses, we calculated a mean across all nine items of the SCL-S-9 ranging from 0 to 4 with a higher mean indicating more severe parental mental health problems. Good internal consistency for the SCL-S-9 was found in the present study (Cronbach's α ranged from .81 to .84 across the measurement

points). Only for the purpose of sample description, we categorized the children and adolescents into two groups of participants with parents with and without mental health problems based on the SCL-S-9 score (using a recommended cut-off of the mean plus two standard deviations of a reference sample or a higher score as indicator for given mental health problems [42]).

Self-efficacy. The General Self-Efficacy Scale (SE) [43, 44] was used to assess self-reports of children and adolescents at each measurement point of the study. The ten items of the SE (e.g., "It is easy for me to stick to my aims and accomplish my goals") are rated on a 4-point-scale (0 = *not at all true* to 3 = *exactly true*). In the present study, a mean across all ten items was calculated ranging from 0 to 3 with a higher mean indicating higher self-efficacy. The internal consistency of the SE in the investigated sample was good (Cronbach's α ranged from .80 to .83 across measurement points).

Family climate. Family climate was measured by children's and adolescents' self-reports using eight items of the German Family Climate Scale (FCS) [45] at each measurement point of the study. The FCS is the German adaptation of the Family Environment Scale (FES) [46]. The administered eight items of the FCS pertain to the domains family cohesion (e.g., "In our family everybody cares about each other's worries") as well as recreational activities ("We often go to the cinema, visit sport events or go on excursions"), and are offered with a 4-point response scale (from 0 = *not true* to 3 = *exactly true*). We recoded negatively phrased items and calculated a mean score over the administered eight items of the FCS that ranged from 0 to 3 with higher values indicating better family climate. Good internal consistency was found for the investigated 8-item FCS score in the investigated sample (Cronbach's α ranged from .78 to .83 across measurement points).

Social support. Social support was measured based on the Social Support Survey (SSS) [47] at each measurement point of the study. We used a self-report short version of the German translation of the SSS which is applicable to children and adolescents (SSS-short). The eight items of the administered SSS-short assess how often specific types of support were available for the child or adolescent (e.g. "How often is the following type of support available for you if you need it?: Someone you can count on to listen to you, when you need to talk") by means of a 5-point rating-scale (0 = *none of the time* to 4 = *all of the time*). The calculated mean over all items of the SSS-short ranged from 0 to 4 with a higher mean representing more available social support. Good to excellent internal consistency was found for the SSS-short in the present study (Cronbach's α ranged from .88 to .91).

Data analyses

We used a two-step approach to investigate the effects of the above described risk and protective factors on HRQoL initially as well as over time. At first, we calculated a latent growth model (LGM) for each construct included in our analyses (i.e., HRQoL, mental health problems, parental mental health problems, self-efficacy, family climate, and social support). LGMs are frequently used in social, psychological, and health research for the analysis of longitudinal data. This method is particularly suitable for analyses of change in behavior [48]. By means of LGMs, two latent factors, i.e., intercept and slope, can be estimated using a regression-type line of the variable of interest over time. The intercept represents the initial status of the variable at baseline and the slope shows the change in the same variable over time. In the present study, we used the calculated intercepts and slopes for each construct in subsequent linear regression analyses. Regression Model A0 served to investigate whether initial HRQoL was predicted by initial mental health problems, parental mental health problems, self-efficacy, family climate, and social support (using only intercepts). Regression Model B0 was used to

analyze whether the change in HRQoL (slope) was predicted by the initial states of mental health problems, parental mental health problems, self-efficacy, family climate, and social support (intercepts), as well as by the change in these variables over time (slopes). Age, gender, SES, and migration background were included in both regression models as covariates; further, we added the interaction of age by gender to both models. Prior to conducting regression analyses, we centered metric predictors to be included in Models A and B.

By means of further regression models we investigated whether the relationships between HRQoL and the examined risk factors were moderated by the investigated protective factors. Model A1 served to investigate potential moderating effects of initial protective factors self-efficacy, family climate, and social support on the association between initial mental health problems and initial HRQoL. Correspondingly, Model A2 was used to analyze whether the initial protective factors self-efficacy, family climate, and social support moderated the relationship between initial parental mental health problems and initial HRQoL. Subsequently, we analyzed whether associations between the change in HRQoL and the initial state of mental health problems as well as the change in mental health problems were moderated by self-efficacy, family climate, and social support using Model B1. Finally, we investigated whether associations between the change in HRQoL and the initial state of as well as the change in parental mental health problems were moderated by self-efficacy, family climate, and social support with Model B2. We controlled for effects of sociodemographic variables (i.e., age, gender, SES, migration status, and the interaction between age and gender) in all moderator models.

To evaluate the strengths of the detected effects based on standardized regression weights, we used Cohen's rules of thumb [49] with $\beta = .1$ indicating a small, $\beta = .3$ a medium, and $\beta = .5$ a strong effect. The LGMs were calculated using Mplus 6.11 [50], regression analyses were conducted using IBM SPSS 22.

Results

The analyzed sample of children and adolescents aged 11 to 17 years at baseline (n = 1,554) is described in Table 1. About half of the investigated children and adolescents were female (51%), the mean age was 13.9 years (SD = 2.97), and 8% of the children and adolescents had a migration background. Moreover, a proportion of 23% of the participants had low, 51% medium, and 27% had high SES. Further, a proportion of 11% of the children and adolescents reported mental health problems (according to SDQ groups *borderline* and *abnormal*) and 8% of the participants had parents with mental health problems at baseline. Self-reported HRQoL was low in 8% of the participants, moderate for 77%, and high in 15% of the participants at baseline.

We calculated LGMs including a linear growth for each investigated construct (i.e., HRQoL, mental health problems, parental mental health problems, self-efficacy, family climate, and social support). Intercepts and slopes resulting from LGMs were used for the subsequent regression analyses.

Results for regression Model A0 (Table 2) showed that female gender, older age, lower SES, and migration background were all associated with lower HRQoL at baseline. The significant interaction effect indicated that the gender-specific difference in HRQoL was more pronounced in older compared to younger children and adolescents. Further, the potential risk factors mental health problems as well as parental mental health problems were both negatively associated with initial HRQoL. Moreover, the potential protective factors self-efficacy, family climate, and social support were all positively related to HRQoL at baseline. The standardized regression coefficients showed that mental health problems had a medium effect on HRQoL in children and adolescents, whereas for parental mental health problems only a very small to

Table 1. Description of the analyzed sample of children and adolescents aged 11 to 17 years (at baseline).

	Baseline		1-year follow-up		2-year follow-up	
	n (%)	*M* (*SD*)	*n*	*M* (*SD*)	*n*	*M* (*SD*)
Sociodemographic data[1]						
Female	785 (51%)					
Age (in years)		13.90 (1.97)				
Socioeconomic status		11.81 (4.16)				
Migration background	126 (8%)					
Risk factors						
Mental health problems	1,538	0.49 (0.23)	1,213	0.40 (0.22)	1,185	0.38 (0.22)
Parental mental health problems	1,536	0.60 (0.52)	1,241	0.60 (5.34)	1,212	0.51 (0.51)
Protective factors						
Self-efficacy	1,527	2.13 (0.38)	1,210	2.15 (0.44)	1,184	2.17 (0.41)
Family climate	1,538	1.83 (0.53)	1,171	1.83 (0.52)	988	1.80 (0.53)
Social support	1,533	3.12 (0.74)	1,175	3.29 (0.67)	992	3.32 (0.65)
Health related quality of life	1,378	3.09 (0.53)	1,199	3.20 (0.51)	1,138	3.18 (0.53)

[1] Sociodemographic data were available for the total sample under analysis ($n = 1,554$).

M = mean, *SD* = standard deviation; for measures, see text (Methods).

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Table 2. Predictors of the initial status and the change in child and adolescent health-related quality of life.

	Regression Model A0[1] predicting initial HRQoL			Regression Model B0[2] predicting change in HRQoL		
	b	β	*p*	*b*	β	*p*
Constant	*3.12*		*< .001*	*0.05*		*< .001*
Sociodemographic data						
Female	-0.10	-.14	< .001	-0.01	-.06	.012
Age (in years at baseline)	-0.03	-.17	< .001	0.00	.03	.443
Age by gender	-0.01	-.06	.031	0.00	.09	.007
Socioeconomic status (at baseline)	-0.01	-.07	< .001	0.00	.04	.132
Migration background	-0.05	-.04	.026	-0.01	-.04	.095
Risk factors						
Initial mental health problems (intercept)	-0.74	-.34	< .001	-0.00	-.01	.719
Initial parental mental health problems (intercept)	-0.07	-.08	< .001	0.00	.02	.389
Change in mental health problems (slope)				-0.28	-.29	< .001
Change in parental mental health problems (slope)				-0.03	-.03	.207
Protective factors						
Initial self-efficacy (intercept)	0.23	.17	< .001	-0.01	-.03	.291
Initial family climate (intercept)	0.15	.16	< .001	-0.01	-.05	.099
Initial social support (intercept)	0.13	.16	< .001	0.00	.03	.282
Change in self-efficacy (slope)				0.07	.15	< .001
Change in family climate (slope)				0.02	.04	.094
Change in social support (slope)				0.04	.09	.001

[1] Linear regression Model A0 ($n = 1,554$); model fit: adjusted $R^2 = .49$; $F = 151.22$.

[2] Linear regression Model B0 ($n = 1,554$); model fit: adjusted $R^2 = .16$; $F = 20.82$.

HRQoL = health-related quality of life; *b* = unstandardized regression coefficient; β = standardized regression coefficient; for measures see text (Methods).

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small corresponding effect was found. For protective factors, consistently small effects on initial HRQoL were found.

The findings for regression Model B0 (Table 2) showed less increase in HRQoL over time for girls compared to boys; the significant interaction effect indicated that this gender-specific difference in the change in HRQoL was more pronounced in younger compared to older children and adolescents. Concerning potential risk and protective factors, we found no effects of the initial states in these factors on the change in HRQoL over time. However, increasing mental health problems were associated with decreasing HRQoL in children and adolescents over time. No effect was found for the change in parental mental health problems on the change in child and adolescent HRQoL. Concerning potential protective factors, improving self-efficacy as well as improving social support were both associated with an improvement in HRQoL over time. No significant association between the changes in the family climate and in HRQoL over time could be found. According to Cohen [49], the effect of the change in mental health problems on the change in HRQoL was small to medium, the effect of the change in self-efficacy was small, and the effect for the change in social support was very small to small. The results for both regression models are integrated in Fig 1.

Further regression models served to investigate potential moderating effects of the investigated protective factors on the relationships between the examined risk factors and HRQOL. However, the results indicated no moderating effect for any protective factor on the relationships of HRQoL with mental health problems (Models A1 and B1) or with parental mental health problems (Models A2 and B2). The corresponding results are presented as Supporting Information (Tables A and B in S1 File).

Discussion

The aims of the present study were to provide population-based findings concerning the effects of potential risk and protective factors on overall child and adolescent HRQoL initially (at baseline) as well as over time. Besides effects of the sociodemographic variables age, gender, SES, and migration background we found negative effects of the investigated risk factors (i.e., mental health problems and parental mental health problems), and positive effects of the investigated personal, familial, and social protective factors (i.e., self-efficacy, family climate, and social support) on the HRQoL in children and adolescents at baseline. In our longitudinal analysis, we detected an interaction effect of age by gender as well as a negative effect of the change in the risk factor mental health problems, and positive effects of changes in the protective factors self-efficacy and social support on the change in HRQoL over the course of two years. In more detailed analyses, we detected no moderating effects of any protective factor on the relationships between HRQoL and the investigated risk factors.

Our analyses based on baseline data indicated that female gender and older age were negatively associated with initial HRQoL, with the gender-specific difference being more pronounced in older compared to younger participants. These findings are in line with results from previous cross-sectional population- and school-based studies [20, 51]. We further found a negative effect of SES on initial HRQoL. However, former studies in general population or school-based samples reported positive associations between socioeconomic variables and HRQoL in children and adolescents [21, 22]. Yet, the negative effect in our analyses of SES on initial HRQoL was very small ($\beta = —.07$) and more detailed a-posteriori investigations revealed this to be a suppressor effect (SES did not correlate with initial HRQoL ($r = .01$; $p = .600$), nor could we detect a substantial correlation for SES with any other construct included in our analyses). Moreover, a given migration background was associated with lower initial HRQoL in our sample, thereby confirming results from previous studies investigating this relationship [31, 5].

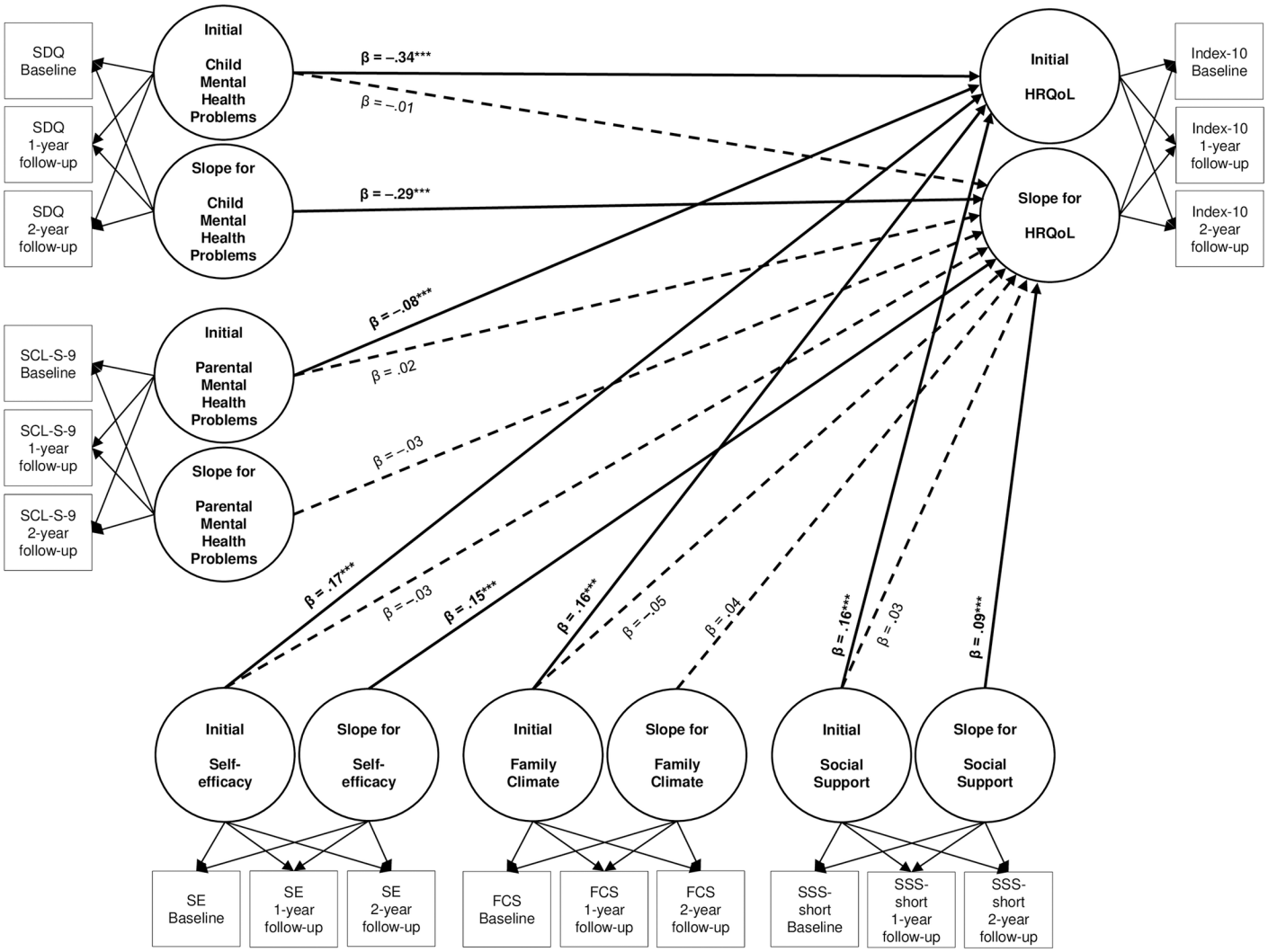


Fig 1. Effects of risk and protective factors on health-related quality of life in children and adolescents. Continuous lines mark significant effects, interrupted lines indicate non-significant effects, resulting from regression Models A and B. $n = 1{,}554$. HRQoL = Health-related quality of life measured with the KIDSCREEN-10 Index [8]; SDQ = Strengths and Difficulties Questionnaire [39]; SCL-S-9 = Symptom-Check List Short version-9 [41, 42]; SE = General Self-Efficacy Scale [43,44]; FCS = an eight-item score based on the Family Climate Scale [45,46]; SSS-short = eight items of the German version of the Social Support Survey [47]; β = standardized regression coefficient; ***$p \leq .001$.

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Regarding the associations of risk and protective factors with HRQoL at baseline our analyses revealed expected results: In line with the existing body of literature [23, 25], the investigated risk factors mental health problems and parental mental health problems had negative effects on initial HRQoL. Further, positive associations were found between the investigated protective factors (i.e., self-efficacy, positive family climate, and social support) with initial HRQoL, thereby corroborating results from previous cross-sectional studies based on population- or school-based samples [28–30].

Our longitudinal analyses indicated that the increase over time of girls' HRQoL was less pronounced compared with the increase of boys' HRQoL. This finding may reflect the fact that the challenging transition period between childhood and adulthood affects girls differently compared to boys (for a detailed description of changes and processes involved see

e.g., [52–54]). We further detected that the gender-specific difference in the change of HRQoL was more pronounced in younger compared to older children and adolescents. This effect may be due to the earlier onset of puberty in girls compared with boys [55] and the related changes in hormonal states that have been shown to be associated with changes of mood and behavior—particularly in younger girls [54, 56]; which in turn may also affect HRQoL and well-being. Furthermore, the bodily changes associated with the onset of puberty—which are more visible in girls compared with boys—may give rise to actual or perceived social reactions, leading to decreased mental health and well-being in girls compared with boys [52, 57].

In our longitudinal analyses we moreover found that change in mental health of the children and adolescents was associated with change in HRQoL. Also, changes in self-efficacy and social support were related to change in HRQoL. These findings based on longitudinal data are in line with results from former studies based on cross-sectional data and underline the importance to consider mental health as a risk factor and self-efficacy as well as social support as important protective factors of HRQoL in children and adolescents. Longitudinal studies on the development of HRQoL in children and adolescents are scarce. The majority of the existing studies investigated the effects of age and gender on HRQoL over a period of six months [58–60] or of up to three years [61–63]. None of these studies investigated the risk and protective factors examined in our study. Barkmann et al. [31] however investigated a comprehensive model on the effects of several factors including child and parental mental health problems on the five domains of HRQoL according to the KIDSCREEN-27 (i.e., physical well-being, psychological well-being, relationship with parents & autonomy, peers & social support, and school environment) over the course of two years based on the same data set as analyzed in the present study. In comparison, we investigated an overall HRQoL score according to the KIDSCREEN-10 Index, focused on risk and protective factors, and chose a different method of analysis compared to those authors. Overall, the results of both studies underline the importance of considering the risk factor mental health problems for the development of HRQoL in children and adolescents.

For our longitudinal model the proportion of the explained variance in the outcome was only 16% (compared to 49% for our baseline model). We found a small to medium effect for the change in mental health problems on the change in HRQoL, but the remaining effects were only very small to small, if given at all. We believe that our longitudinal results at least partly reflect the fact that we investigated a general population sample with a consistent level of rather good HRQoL, little mental health problems, as well as with good self-efficacy, family climate, and social support; moreover, our study only covered a period of two years. These aspects are most apparent regarding the slope for parental mental health problems, which did not vary substantially across individuals. However, our results may also indicate that the development of HRQoL over time may be associated with factors that we did not consider in our model. These factors may include health-related variables such as physical health and chronic disorders of the children and adolescents [64, 65], and further potential predictors such as variables related to adolescence (e.g., body image, peer relationships, and bullying [57], pubertal development [62]), or academic demands at school [28].

Our results indicate that the investigated factors may have direct effects on HRQoL, but we found no evidence for moderating effects of self-efficacy, family climate or social support on the relationships between the risk factors and HRQoL by means of our moderator models. Following the distinction between protective and resource factors as summarized and suggested by Rose et al. [66], self-efficacy, family climate and social support should be described as resource factors of child and adolescent HRQoL based on our findings. Similarly, Otto et al. [67] did not find any moderating effects of personal, familial and social factors on the

investigated relationship between the risk factor parental anxiety and child generalized anxiety in their study based on the same longitudinal data set of the BELLA study. However, for depressive symptoms in children and adolescents, Klasen et al. [68] reported moderator effects of familial and social protective factors (i.e., family climate and social support) on the relationship between parental mental health problems and child depressive symptoms using longitudinal data from the German BELLA study. Future research focusing on risk and protective or resource factors of HRQoL may wish to further analyze other potential kinds of relationships of such factors with HRQoL (compare [16–18]).

The German BELLA study is a large population-based cohort study on child and adolescent well-being and mental health. Numerous studies based on data from the BELLA study have been published including studies on HRQoL (e.g., [69,31]) as well as studies on the prevalence and trajectories of mental health problems in children and adolescents [70–72]. Moreover, in a recently published cross-sectional analysis based on data from the 6-year-follow-up of the population-based BELLA study, risk factors for parental as well as for child mental health problems were investigated [73]. In our present study, we focused on HRQoL and analyzed longitudinal data of the BELLA study. The present study adds to the body of literature findings on factors affecting child and adolescent overall generic HRQoL initially as well as over time. Our results may help to inform policy makers when planning health literacy and health promotion programs. In particular, we identified modifiable factors related to child and adolescent health and well-being [4] that may also be of interest with regard to empowerment of children and adolescents [74, 75].

This study has the following limitations. Our longitudinal data only covered a period of two years; future studies may wish to analyze the development of HRQoL in children and adolescents over a longer period of time. Moreover, future studies may wish to investigate effects of further risk and protective or resource factors on HRQoL, which were not included in the analyses of the present study. The present study has the following strengths: We investigated data from the BELLA study, an important cohort study on the well-being and mental health of children and adolescents in Germany administering established measurement tools. Further, we used an appropriate and modern method of analysis that allowed us to examine our metric data without any loss of information compared to methods analyzing categorized data. However, future studies may wish to use another method such as latent class modeling in order to identify groups based on longitudinal HRQoL data and subsequently may wish to investigate these groups in greater detail.

Overall, the present study shows how important children's and adolescents' mental health is with regard to their HRQoL. Furthermore, we were able to demonstrate the beneficial effects of self-efficacy and social support on HRQoL in children and adolescents over time, which should be considered in prevention programs.

Supporting information

S1 File. Moderator models. Table A. Self-efficacy, family climate, and social support moderating the relationship between mental health problems and health-related quality of life in children and adolescents. Table B. Self-efficacy, family climate, and social support moderating the relationship between parental mental health problems and health-related quality of life in children and adolescents.
(DOCX)

S2 File. Dataset.
(XLS)

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Supporting Information. S1 File. Moderator models.

Manuscript title:

Risk and protective factors of health-related quality of life in children and adolescents: results of the longitudinal BELLA study

Journal:
PLOS One

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S1A Table. Self-efficacy, family climate, and social support moderating the relationship between mental health problems and health-related quality of life in children and adolescents.

	Regression Model A1[1] predicting initial HRQoL			Regression Model B1[2] predicting change in HRQoL		
	b	**β**	***p***	***b***	**β**	***p***
Constant	3.17		<.001	0.05		<.001
Female	-0.10	-.14	<.001	-0.01	-.06	.014
Age (in years at baseline)	-0.03	-.17	<.001	0.00	.03	.441
Age by gender	-0.01	-.05	.042	0.00	.09	.008
Socioeconomic status (at baseline)	-0.01	-.07	<.001	0.00	.03	.184
Migration background	-0.06	-.05	.014	-0.01	-.04	.104
Risk factor						
Initial mental health problems (intercept)	-0.77	-.36	<.001	0.00	.00	.900
Change in mental health problems (slope)				-0.27	-.28	<.001
Protective factors						
Initial self-efficacy (intercept)	0.22	.17	<.001	-0.01	-.03	.343
Change in self-efficacy (slope)				0.07	.15	<.001
Initial family climate (intercept)	0.15	.16	<.001	-0.01	-.05	.101
Change in family climate (slope)				0.02	.04	.085
Initial social support (intercept)	0.14	.17	<.001	0.00	.02	.436
Change in social support (slope)				0.04	.09	.001
Interactions between risk and protective factors						
Initial mental health problems by initial self-efficacy	0.06	.01	.709	0.01	.01	.765

Change in mental health problems by change in self-efficacy				-0.06	-.01	.718
Initial mental health problems by change in self-efficacy				-0.01	-.00	.901
Change in mental health problems by initial self-efficacy				0.04	.01	.690
Initial mental health problems by initial family climate	0.06	0.01	.623	-0.01	-.01	.701
Change in mental health problems by change in family climate				-0.01	-.00	.939
Initial mental health problems by change in family climate				-0.03	-.01	.623
Change in mental health problems by initial family climate				0.09	.04	.208
Initial mental health problems by initial social support	-0.13	-0.03	.177	0.02	.03	.321
Change in mental health problems by change in social support				-0.07	-.01	.748
Initial mental health problems by change in social support				0.01	.00	.922
Change in mental health problems by initial social support				-0.11	-.05	.066

[1] Linear regression Model A1 (n = 1,554); model fit: adjusted R^2 = .49; F = 123.62; [2] Linear regression Model B1 (n = 1,554); model fit: adjusted R^2 = .16; F = 12.57; HRQoL = health-related quality of life; b = unstandardized regression coefficient; β = standardized regression coefficient; for measures see main manuscript (Methods).

S1B Table. Self-efficacy, family climate, and social support moderating the relationship between parental mental health problems and health-related quality of life in children and adolescents.

	Regression Model A2[1] predicting initial HRQoL			Regression Model B2[2] predicting change in HRQoL		
	b	**β**	***p***	***b***	**β**	***p***
Constant	3.18		<.001	0.05		<.001
Female	-0.13	-.19	<.001	-0.01	-.07	.009
Age (in years at baseline)	-0.03	-.15	<.001	0.00	.02	.532
Age by gender	-0.02	-.08	.008	0.00	.10	.004
Socioeconomic status (at baseline)	-0.00	-.05	.009	0.00	.02	.477
Migration background	-0.07	-.05	.011	-0.01	-.04	.115
Risk factor						
Initial parental mental health problems (intercept)	-0.11	-.12	<.001	0.00	.02	.586
Change in parental mental health problems (slope)				-0.05	-.04	.112
Protective factors						
Initial self-efficacy (intercept)	0.35	.26	<.001	0.00	.01	.630
Change in self-efficacy (slope)				0.10	.21	<.001
Initial family climate (intercept)	0.22	.24	<.001	-0.01	-.06	.057
Change in family climate (slope)				0.03	.07	.014
Initial social support (intercept)	0.16	.20	<.001	0.00	.03	.305
Change in social support (slope)				0.04	.09	.001
Interactions between risk and protective factors						
Initial parental mental health problems by initial self-efficacy	0.05	.02	.493	0.01	.01	.631

Change in parental mental health problems by change in self-efficacy				-0.15	-.02	.515
Initial parental mental health problems by change in self-efficacy				-0.03	-.03	.347
Change in parental mental health problems by initial self-efficacy				0.09	.02	.443
Initial parental mental health problems by initial family climate	0.02	.01	.698	0.01	.05	.165
Change in parental mental health problems by change in family climate				0.15	.02	.500
Initial parental mental health problems by change in family climate				0.03	.03	.299
Change in parental mental health problems by initial family climate				0.00	.00	.977
Initial parental mental health problems by initial social support	0.00	.00	.992	-0.00	-.02	.626
Change in parental mental health problems by change in social support				0.06	.01	.804
Initial parental mental health problems by change in social support				0.05	.04	.144
Change in parental mental health problems by initial social support				-0.11	-.05	.144

[1] Linear regression Model A2 (n = 1,554); model fit: adjusted R^2 = .41; F = 89.57; [2] Linear regression Model B2 (n = 1,554); model fit: adjusted R^2 = .08; F = 6.66; HRQoL = health-related quality of life; b = unstandardized regression coefficient; β = standardized regression coefficient; for measures see main manuscript (Methods).

Conclusions

The findings of Publication 5 highlight that parental, and child and adolescent mental health problems are negatively associated, and self-efficacy, family climate, and social support are positively associated with HRQoL in children and adolescents. However, while changes in child and adolescent mental health problems did affect changes in HRQoL, changes in parental mental health problems did not. Regarding the protective factors, self-efficacy and social support were positively associated woth changes of HRQoL in youth. Furthermore, protective factors did not buffer the effects of risk factors on HRQoL, meaning that only decreases of risk factors over time may have contributed to increased HRQoL over time. These findings highlight that while parental mental health problems are significantly associated with children and adolescents' mental health – as demonstrated in Publication 2 – and are negatively linked to HRQoL, changes in parental mental health do not necessarily influence HRQoL over time.

This chapter summarised the findings of the five publications comprising this cumulative thesis and highlighted their thematic interconnections. Chapter 6 discusses these results in relation to the thesis's overarching research questions and the current body of literature.

6. Discussion

This section discusses the results in relation to the thesis's overarching research questions and the current body of literature (Chapter 6.1). Chapter 6.2 discusses implications for future research and for future prevention and intervention strategies and programmes. Finally, Chapter 6.3 examines the methodological strengths and limitations of this thesis.

6.1. Summary and Discussion of Results

The findings presented in Chapter 5, drawn from the publications included in this thesis, are discussed in relation to the overarching research questions and contextualised within the current state of research.

The **first research question** focussed on trajectories of internalising and externalising mental health problems in children and adolescents and age- and gender-related differences. Publication 1 examined these questions by calculating trajectories and prevalence rates of internalising and externalising mental health problems in children and adolescents aged 7 to 19 years. The findings revealed changes of symptom presentation in the internalising and externalising mental health problems and in part age- and gender-specific patterns. While internalising problems increased over the six-year period and where at least twice as high in girls compared to boys, externalising mental health problems decreased over time and were more frequent in boys. These findings are in line with previous research (Costello et al., 2011). In addition, discrepancies between self- and parent-report were observed. Again, these finding are in line with the findings from Costello et al. (2011).

To our knowledge, in the years between the publication of these results and the onset of the Covid-19 pandemic in early 2020, similar data from representative surveys in Germany have not been published. Internationally, a systematic review and meta-analysis from 2018 analysing 20 studies examining longitudinal developments of depressive symptoms in children, adolescents, young people aged 4 to 26 identified several different trajectories of depressive mental health problems (Shore et al., 2018). Most of these examined studies reported increasing or high trajectories of depressive symptoms over time. A smaller number of studies however reported moderate or decreasing trajectories. Female participants experienced higher and more persistent symptoms of depression compared to male participants (Shore et al., 2018). The risk factors for the increasing or high trajectories included, amongst others, female gender, low SES, and stressful life events (Shore et al., 2018). Shore et al., (2018) also reported strong parental support and peer support as protective factors. These findings predominantly confirm the results presented in Publication 1 regarding trajectories and gender- and age-specific aspect of internalising mental health problems and furthermore highlight the relevance of certain risk (female gender, SES, stressful life events) and protective factors (parental support, peer support) to child and adolescent (in this case internalising) mental

health presented in this thesis. With regards to externalising symptoms, the results based on the BELLA study data analysed in Publication 1 were replicated by e.g., Atherton et al., (2018). The authors investigated trajectories of three specific externalising mental health problems in a population-based sample of *N* = 674 young people aged 10 to 17. On average, ADHD symptoms declined between the ages of 10 and 17. Oppositional defiant symptoms increased until approximately the age of 13 before declining, conduct disorder symptoms slowly increased until age 15 and then stabilised. In line with these findings, parent-reported ADHD symptoms in Publication 1 steadily declined from age 7 with more boys showing ADHD symptoms than girls. However, in our study, and unexpectedly, girls self-reported more ADHD symptoms from about age 13 compared to boys. Conduct disorder symptoms in Publication 1 were only parent-reported, slowly decreased over time, with a slight increase between the ages of 12 and 14, and where higher in boys compared to girls. Overall, the investigation of trajectories of internalising and externalising mental health problems seem to follow differentiated, and age- and gender-specific pathways, which future research should further investigate. Further research should furthermore include the influence of risk and protective factors on these pathways to assess the effect these factors have on the development of mental health problems during childhood and adolescence. Such investigations have been conducted by e.g., Maurer et al. (2023) and Kaman et al. (2021), with data from the BELLA study. Risk factors for increased mental health problems six years later included negative mother-child bond and school stress (for depressive symptoms – Kaman et al., 2021), and protective factors family climate and social support (for overall mental health problems – Maurer et al., 2023), as well as peer competence (in girls) and family cohesion (in boys) for depressive symptom (Kaman et al., 2021).

With the on-set of the Covid-19-pandemic, the landscape of trajectories of mental health problems in children and adolescents was significantly altered (Kauhanen et al., 2023). Comparisons of trajectories with studies published before and after the onset of the Covid-19 pandemic in early 2020 should be done so with caution. However, comparisons are facilitated when the respective studies use comparable methods and designs (Kauhanen et al., 2023). See Ravens-Sieberer et al. (2021) and Ravens-Sieberer et al. (2023) for analyses of trajectories of mental health outcomes – including internalising and externalising mental health problems – prior and during the pandemic using data of a representative sample of German children and adolescents. For a comprehensive overview on the research of mental health problems in children, adolescents, and young adults, pre-pandemic and during the pandemic, see the systematic review by Kauhanen et al. (2023).

With the **second research question**, the focus of this thesis turned toward families with parental mental health problems, their offspring, and the risk constellation affecting these families. Publication 2 analysed *N* = 1158 families with children aged between 11 and 17. The

findings demonstrate that approximately one in five families in Germany report parental mental health difficulties and in these families, about 20% of the children and adolescents report mental health problems themselves. Critically, child and adolescent mental health problems were significantly more prevalent in these at-risk families compared to families without such problems. Even after accounting for co-occurring risk factors, children and adolescents in these vulnerable families remain twice as likely to experience mental health difficulties compared to their peers from families without parental mental health problems. The findings of Publication 2 furthermore support the cumulative risk hypothesis, as families with parental mental health problems presented a significantly higher risk constellation with more children and adolescents reporting mental health problems compared to families without parental mental health problems. Notably, certain risk factors within the families with parental mental health problems affected parents and their offspring differently. Several more risk factors influenced parental mental health problems (parental daily strain and chronic disease, stressful life events, unemployment, their offsprings' mental health problems, SES) than child and adolescent mental health problems (stressful life events, parental mental health problems, the parents' age, and female gender). These findings underscore that while parental mental health problems are a critical and significant risk factor for child and adolescent mental health, they must be understood within a broader constellation of co-occurring stressors, most of wich occuring within the parents' own lives.

The findings presented in Publication 2 are supported by recent population-based data: International estimates indicate that up to 23% of young people under the age of 18 have at least one parent with mental illness (Leijdesdorff et al. 2017). In Sweden, a large-scale, population-based study found that 11% of Swedish children and adolescents have a parent with a mental illness treated in secondary care (Pierce et al., 2020). In a Norwegian sample, adolescents aged between 16 and 19 years from families with parental mental health problems had approximately two- to fourfold increased risks of developing mental health issues themselves (Heradstveit et al., 2021). In clinical samples, these effects are more pronounced: a meta-analysis found that up to 55% of children with parents suffering from severe mental illnesses (e.g., schizophrenia, major depression, bipolar disorder, or severe borderline personality disorder) develop mental health disorders themselves (Rasic et al., 2014). With regard to the cumulative risk hypothesis, a Danish population-based study demonstrated that children and adolescents from families with parental mental health issues and multiple risk factors exhibited a higher likelihood of mental health problems than their peers without parental mental health problems (Lund et al., 2019). These recent data show that children and adolescents from families with parental mental health problems remain a vulnerable population that requires targeted prevention and intervention programmes to address their specific needs.

The protective factors identified in Publication 3 may offer valuable insights for such programmes.

Research question three was investigated by Publication 3. It further examined the vulnerable population of families with parental mental health problems and investigated protective factors associated with positive mental health and well-being. The results demonstrate that positive child and adolescent mental health was associated with more relational factors, i.e., social competence, parental support, and positive school climate. These results align with the theoretical framework outlined in Chapter 2.1.3, 2.3.1 and the literature discussed in Chapter 2.6.3, which highlight the buffering effect of significant relationships beyond the mentally ill parent. In contrast, HRQoL was associated with individual resources such as self-efficacy, optimism, as well as factors related to the direct environment, such as a positive family and school climate. School climate emerged as a significant factor for both positive mental health and well-being. Together, these findings underscore that different domains of protective factors in promoting mental health and well-being exist, suggesting that different conditions are necessary for positive mental health to occur compared to HRQoL. While supportive relationships are critical for mental health, the perception of personal competences seems to play a more central role in fostering overall well-being.

With regards to more current research, a recent systematic literature review examining 26 studies by means of 37 publications (Van Schoors et al., 2023) revealed five protective factors for children and adolescents of families with parental mental health problems, among which *Support*, *Family Functioning and Connectedness*, and *Parenting* (the other two being *Information* and *Child Coping*) shall be discussed here. *Support* included assistance, encouragement, and care from either family, friends, or professional networks. Emotional support was most frequently emphasised as protective factor and included supportive figures such as a second, healthy parent, siblings, extended family members (e.g., grandparents, aunts), friends or neighbours, and community role models (teachers, coaches) (Van Schoors et al., 2023). Research on *Family Functioning* showed mixed results: some studies found that balanced family dynamics seemed to protect against internalising mental health problems, other studies found no clear link. *Connectedness* within the family, such as close parent-child and sibling relationships however consistently emerged as a protective factor, reducing the risk of child and adolescent mental health problems and buffering the effects of parental mental illness (Van Schoors et al., 2023). Furthermore, strong peer relationships and social skills supported better mental health. Overall, strong emotional bonds within family, friends, and school networks were critical factors for positive child and adolescent mental health and well-being (Van Schoors et al., 2023). *Parenting* played a crucial role as a protective factor and was defined as showing warmth, responsiveness, acknowledging and validating the child's emotions and providing quality time. Positive parenting was linked to fewer internalising and

externalising symptoms (Van Schoors et al., 2023). These results support the findings from Publication 3 and the literature presented in this thesis. They collectively offer valuable insights for developing targeted prevention and intervention strategies.

By contrast, the **fourth research question** did not focus on protective factors potentially leading to positive development, but on negative pathways of mental health problems. Publication 4 followed *N* = 116 adolescents with externalising mental health problems into young adulthood and examined their risk behaviours in comparison with their peer without adolescent externalising mental health problems. In young adulthood, individuals with a history of externalising problems were more likely to engage in risky behaviours such as substance use, delinquency, and violence. These associations were particularly pronounced among males with a low SES, who emerged as a high-risk subgroup. The findings of Publication 4 illustrate the enduring impact of early behavioural difficulties and align with models of intergenerational continuity of externalising behaviours, as proposed by Serbin and Karp (2004) and De Genna et al. (2006).

The systematic review and meta-analysis by Bevilacqua et al. (2018) confirm the findings of Publication 4 and provide substantial support for the developmental model of externalising mental health problems by Beauchaine and McNulty (2013) presented in Chapter 2.6.4. The authors analysed several studies on trajectories of externalising mental health problems, specifically, early onset persistent (EOPT), adolescent-onset (AOT) and childhood-limited (CLT) trajectories of externalising mental health problems and the risk of presenting risk behaviours in adulthood (e.g., alcohol consumption, cannabis use, aggression, criminal behaviour, education and occupational outcomes). They found that the EOPT and AOT were persistently associated with a higher risk of poor outcomes in adulthood compared to CLT – with EOPT showing the highest across most outcomes studied. These findings highlight the elevated risk that children and adolescents with externalising mental health problems, in particular males, may face in adulthood, particularly regarding negative outcomes in key areas of life.

Finally, the **fifth research question** investigated risk and protective factors of child and adolescent well-being as contextualised within the framework of HRQoL, thereby highlighting the importance of enhancing the individuals' overall well-being rather than focusing on symptom reduction. Publication 5 examined this research question and explored how changes in problems (parental, and child and adolescent) mental health and protective factors relate to changes in HRQoL. While both parental and youth mental health problems were negatively associated with HRQoL at the cross-sectional level, only a decrease in youth mental health were significantly linked to improvements in HRQoL. Protective factors self-efficacy and social support were positively associated with improvements HRQoL, but they did not buffer the

negative effects of the risk exposure. Instead, reductions of risk factors in the child or adolescent appear to be necessary for HRQoL to improve. These findings suggest that decreasing risks factors for better HRQoL may be more critical than simply enhancing protective resources.

More recent findings from the BELLA study examining the influence of risk and protective factors on HRQoL over time have been published by Plass et al. (2021) and confirm our findings. The authors investigated the influence of risk factors (parental mental health problems, child and adolescent internalising and externalising mental health problems) and of protective factors (self-efficacy, family climate, social support) in children and adolescents from families with parental mental health problems over a period of two years. The findings showed that internalising and externalising problems were risk factors for HRQoL, while all examined protective factors were identified as resources that support HRQoL (Plass et al., 2021). Cross-sectional data from the large-scale population-based INTEGRATE-ADHD study in Germany suggest that parental aspects of mental health problems and stressors constutited a risk for low HRQoL in children and adolescents with ADHD, while protective factors family climate and social support, indicating that these are protective factors.

Chapter 6.1 discussed the results of the five publications this thesis is comprised of and contextualised them within more recent research findings. The next chapter suggests implications for research and policymakers.

6.2. Implications and Directions for Future Research, Prevention, and Intervention

The findings of this thesis identified several particularly vulnerable groups that should be considered in future research, as well as in the design of prevention and intervention programmes: Girls reported higher levels of internalising mental health problems compared to boys as well as compared to parent reports. The latter suggests that internalising symptoms in girls may be insufficiently identified when relying on parental assessments only (Publication 1).

Boys exhibited slightly higher levels of externalising behaviour than girls. These behaviours were more frequently reported by parents than by the boys themselves (Publication 1). Furthermore, boys from low SES background were significantly more likely to engage in risk behaviours in young adulthood compared to their peers and emerged as a high-risk group (Publication 4).

These gender-specific patterns highlight the importance of implementing prevention and intervention strategies that are sensitive to gender differences. Discrepancies between self- and parent-reports – particularly in the case of internalising symptoms among girls – highlight

the need for multi-informant assessment designs and disorder-specific screening tools to improve the accurate identification of mental health problems in children and adolescents.

Furthermore, targeted diagnostic and prevention efforts are needed for boys with externalising mental health problems from a low SES background, as they represent a high-risk group for long-term adverse outcomes (Publication 4). These findings reflect the developmental pathway of externalising risk problems. For policymakers and practitioners, these results underline the value of early identification and intervention of children and adolescents with externalising behaviours.

Children and adolescents growing up in families where a parent has a mental health problem are at increased risk of developing mental health issues themselves (Publication 2). It is essential to identify and strengthen protective factors that can buffer the potential negative effects of impaired parent-child relationships due to parental illness. Our findings indicate that parental support, social competence, and a positive school climate serve as important protective factors (Publication 3). Additionally, individual-level resources play a critical role in promoting overall well-being and should be considered in intervention design (Publications 3 and 5).

Additionally, school climate was identified as a key factor in supporting mental health and well-being. It was shown to be relevant for both reducing mental health problems and for promoting well-being (Publication 3), highlighting the substantial buffering effect that schools can have.

Furthermore, our findings suggest that child and adolescent well-being may profit more from reducing risk factors than from promoting resource factors over time (Publication 5).

These findings emphasise the importance of addressing relational, individual, and family and social factors in the development of mental health interventions, especially for vulnerable populations.

Prevention and intervention programmes have shown that targeting the relevant resources are effective. With regards to youth with externalising mental health problems in Germany several programmes exist. One of which is the Therapy Programme for Children with Aggressive Behaviour – THAV [Therapieprogramm für Kinder mit aggressivem Verhalten] specifically targets boys aged 6 to 12 years with externalising mental health problems such as conduct order or oppositional defiant disorder. The programme combines individualised therapy sessions (cognitive behavioural therapy) with parent management training, as well as interventions involving teachers and peers. Several studies have demonstrated its effectiveness in reducing aggressive behaviours (Giudice et al., 2023).

Another example, focusing on the vulnerable group of families affected by parental mental illness, is the family-based, psychodynamic intervention programme CHIMPs (Children of Mentally Ill Parents), which provides support to children and adolescents growing up in these

families. The manualised CHIMPs programme is comprised of six to eight semi-structured sessions over approximately six months. The sessions focus on topics such as understanding parental mental illness, coping strategies, family relationships, and social support and aims at strengthening relationships between the individual family members (Wiegand-Grefe et al., 2016; Wiegand-Grefe et al., 2021). Building upon the CHIMPs programme, the CHIMPs-NET (Children of Mentally Ill Parents – Research Network) initiative was created to implement and evaluate family-oriented preventive and therapeutic interventions in routine clinical practice across Germany and Switzerland. The randomised controlled multicentre study is ongoing (Wiegand-Grefe et al., 2021). Previous evaluations of CHIMPs programmes revealed that the CHIMPs intervention significantly improved children and adolescents' mental health, HRQoL, as well as social support and family functioning (Wiegand-Grefe et al., 2016).

The next chapter discusses this thesis' methodological strengths and limitations.

6.3. Methodological Strengths and Limitations

This thesis has several important strengths, though some limitations must also be acknowledged[22]. A major strength lies in the use of data from the BELLA study, a large, nationally representative, longitudinal survey of children and adolescents in Germany, enhancing the generalisability of findings. The longitudinal design enables the examination of trajectories of mental health outcomes from childhood through young adulthood and enables understanding of how risk and protective factors shape mental health and well-being across developmental stages. In addition to cross-sectional analyses, this thesis also used longitudinal data to examine mental health outcomes and associated factors over time. Furthermore, prevalence estimates were weighted to ensure representativeness. Another strength is the use of standardised and validated instruments to assess mental health outcomes and related risk and protective factors. In this thesis, the instruments included the use of instruments such as the SDQ, the CBCL, CES-DC, SCARED-5, Conners 3®, the KIDSCREEN-10 Index, and SCL-S-9, among others. These are well-established instruments used in epidemiological research and have demonstrated objectivity, reliability, and validity. Moreover, internal consistency was assessed using Cronbach's α, which showed good reliability for most scales. The inclusion of multiple informants and the careful selection of informants based on the research question and constructs of interest (e.g., self-reports of mental health problems in Publications 2 and 3), increased the reliability and accuracy of the assessments. Furthermore, advanced statistical methods were applied to both cross-sectional and longitudinal data, including multiple logistic regression analyses, LMLM, and LGM.

[22] For a more detailed discussion of the strengths and limitations relating to the methodologies of each publication, please refer to the original articles presented in Chapter 5.

Despite these strengths, several limitations must be considered. First, the analyses are based on observational data, which means that only associations can be established, despite the longitudinal design. Second, longitudinal cohort studies are subject to participant drop-out, this may have affected the results of Publications 1, 4 and 5. In the BELLA study, statistical methods were used to handle missing data and drop-out analyses were conducted. The latter revealed that participants with lower SES and with a migration background were more likely to discontinue participation However, drop-out was not related to health or mental health outcomes (Otto et al., 2020; Ravens-Sieberer et al., 2015). Third, the use of self- and parent-report measures can be affected by reporting biases such as social desirability, recall errors, or other bias, as discussed in Chapter 2.4. Additionally, mental health problems were assessed using screening instruments rather than clinical diagnoses. Although this may restrict the ability to draw conclusions about clinically diagnosed mental disorders, screening instruments offer important insights into subthreshold symptoms that are especially valuable for prevention programmes and are useful for early intervention programmes. Finally, the models investigated in this thesis mostly explained only a small proportion of variance in the outcomes. This may reflect the complex, multifactorial nature of mental health and indicate that additional relevant predictors may need to be included in order to gain a more comprehensive understanding of mental health.

Taken together, the five publications included in this thesis provide an integrative perspective on the development, risk and protective factors, and consequences of mental health problems and well-being in children and adolescents. The publications addressed the overarching research questions by providing longitudinal and multi-informant insights into gender- and age-specific trajectories of internalising and externalising symptoms (Publication 1). They also highlighted the role of parental mental health and co-occurring risks on child and adolescent mental health and well-being (Publication 2 and 5), particularly within families where parents experience mental health problems (Publication 2). Furthermore, protective factors associated with positive mental health and HRQoL were identified in both the general population and vulnerable population of families affected by parental mental health problems (Publication 5 and Publication 3 respectively). This thesis also highlights the long-term consequences of early mental health difficulties, exemplified by externalising problems and their negative developmental pathways into young adulthood (Publication 4), despite their relatively low prevalence during childhood and adolescence (Publication 1). The findings collectively underscore the developmental complexity of mental health problems and well-being, highlighting the importance of relational factors, especially in families where parental mental health impairs the child-parent bond. Overall, this thesis advances the understanding of child and adolescent mental health across both vulnerable and general populations and offers valuable implications for early identification, prevention, and intervention strategies.

VII List of Abbreviations

α	Cronbach's Alpha
ADHD	Attention-deficit/hyperactivity disorder
AOT	Adolescent-onset trajectory of externalising mental health problems
AUDIT	Alcohol Use Disorders Identification Test
BELLA	Behaviour and Wellbeing of Children and Adolescents in Germany
CAT	Computer Adapted Test
CBCL	Child Behaviour Checklist
CES-DC	Center for Epidemiological Studies Depression Scale
CHIMPs	Children of Mentally Ill Parents
CLT	Childhood-limited trajectories of externalising mental health problems
CI	Confidence interval
DALYs	Disability-adjusted life years
DSM	Diagnostic and Statistical Manual of Mental Disorders
EOPT	Early onset persistent trajectory of externalising mental health problems
ESPAD	European School Survey Project on Alcohol and Other Drug Use
HRQoL	Health-related quality of life
ICD	International Classification of Diseases
KiGGS	German National Health Interview and Examination Survey for Children and Adolescents
LGM	Latent growth model
LMLM	Longitudinal multilevel model
M	Mean
MARS	Mannheim Study of Children at Risk – [Mannheimer Risikokinderstudie]
N	Total number of participants in sample
n	Number of participants in a subsample
OR	Odds ratio
PAR%	Population attributable risk expressed as a percentage
R^2	Coefficient of determination
SCARED-5	Screen for Child Anxiety Related Emotional Disorder Short 5-Item Version
SCL-90-R	Symptom Checklist-90 Revised Version
SCL-S-9	Symptom Checklist Short 9-Item Version
SES	Socioeconomic status
SD	Standard deviation
SDQ	Strengths and Difficulties Questionnaire
SSS	Social Support Survey
WHO	World Health Organisation

VIII List of Figures

BELLA study assessment waves, sample sizes, and related publications…….34

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X Summary in English and German

Background. The early years of childhood and adolescence are foundational for establishing lifelong psychological well-being and resilience. In Germany, approximately one fifth of children and adolescents experience mental health problems. More critically, these problems often carry into adulthood and can lead to long-term adverse outcomes. This thesis contributes to the current body of public health research by analysing cross-sectional and longitudinal data and focusing on specific at-risk groups of children and adolescents, as well as associated risk and protective factors, with the aim of informing prevention and intervention programmes. To this end, age- and gender-specific trajectories of mental health outcomes and well-being, relevant risk and protective factors, and particularly vulnerable population groups were examined by means of five publications.

Methods. Analyses were based on data from the German BELLA study, an epidemiological longitudinal survey assessing mental health outcomes and well-being in children, adolescents, and their parents, as well as related risk and protective factors. The outcomes investigated in this thesis include internalising and externalising mental health problems, HRQoL, and risk behaviours in young adults. The influence of personal, familial, and social risk and protective factors was assessed. Standardised and validated instruments alongside other established measurement tools were used. Statistical methods included descriptive analyses, multiple logistic regression, longitudinal multilevel modelling, and latent growth modelling.

Results. The analysis of age- and gender-specific trajectories revealed that girls were more likely to exhibit internalising problems, boys more often showed externalising problems. Over time, internalising problems increased, whereas externalising problems slightly decreased. Furthermore, girls with internalising problems were at risk of being insufficiently identified through parent-reports. Children and adolescents from families with parental mental health problems were found to have a two-fold risk of developing mental health issues themselves compared to their peers – moreover, risks-constellations often accumulated in these families. Protective factors identified for mental health and well-being cross-sectionally as well as over time included self-efficacy, social competence, optimism, parental support, and family and school climate, depending on the specific group and outcome. Another high-risk group included boys with externalising problems from low SES backgrounds, as they more frequently engaged in risk behaviours in young adulthood compared to their peers.

Discussion. The findings compiled in this thesis collectively emphasise the developmental complexity of mental health problems and well-being in girls and boys and highlight the importance of protective factors for positive mental health and well-being. Overall, this thesis advances the understanding of youth mental health across vulnerable and general populations and offers valuable implications for early identification, prevention, and intervention strategies.

Hintergrund: Die frühen Jahre der Kindheit und Jugend sind entscheidend für die Entwicklung eines stabilen psychischen Wohlbefindens im weiteren Lebensverlauf. In Deutschland zeigt etwa jedes fünfte Kind Anzeichen psychischer Auffälligkeiten – diese können jedoch weitreichende Folgen im weiteren Lebensverlauf nach sich ziehen. Die vorliegende Dissertation möchte zur Entwicklung von präventiven Angeboten und Interventionsprogrammen für spezifische und besonders vulnerable Populationen beitragen. Anhand von insgesamt fünf Publikationen werden alters- und geschlechtsspezifische Verläufe psychischer Gesundheit analysiert, sowie auf bestimmte Risikogruppen und dem Einfluss damit verbundener Risiko- und Schutzfaktoren fokussiert.

Methoden: Die Analysen basieren auf Daten der deutschen BELLA-Studie, einer epidemiologischen Längsschnittuntersuchung zur Erfassung der psychischen Gesundheit und des subjektiven Wohlbefindens von Kindern, Jugendlichen und ihren Eltern sowie damit zusammenhängender Risiko- und Schutzfaktoren. In dieser Dissertation wurden internalisierende und externalisierende psychische Auffälligkeiten, die gesundheitsbezogene Lebensqualität, Risikoverhalten im jungen Erwachsenenalter sowie der Einfluss persönlicher, familiärer und sozialer Risiko- und Schutzfaktoren untersucht. Standardisierte und validierte Instrumente sowie weitere etablierte Erhebungsinstrumente wurden hierfür eingesetzt. Die querschnittlichen und längsschnittlichen Daten wurden mittels deskriptiver Analysen, multipler logistischer Regressionen sowie weiterer multivariater Verfahren analysiert, die für längsschnittliche Analysen geeignet sind.

Ergebnisse: Die Analyse alters- und geschlechtsspezifische Verläufe zeigte, dass internalisierende Auffälligkeiten häufiger bei Mädchen, externalisierende Auffälligkeiten hingegen häufiger bei Jungen auftraten. Im Zeitverlauf nahmen internalisierende Auffälligkeiten zu, externalisierende gingen leicht zurück. Mädchen mit internalisierenden Auffälligkeiten wurden nur unzureichend von Elternberichten identifiziert. Kinder und Jugendliche mit psychisch belasteten Eltern hatten ein zweimal so großes Risiko, psychisch auffällig zu werden. Außerdem traten in diesen Familien anderweitige Risiken gehäuft auf. Als protektive Faktoren erwiesen sich – abhängig von Outcome und Subgruppe – Selbstwirksamkeit, soziale Kompetenz, Optimismus, elterliche Unterstützung sowie ein positives Familien- und Schulklima. Jungen mit externalisierendem Verhalten aus sozioökonomisch benachteiligten Familien bildeten eine weitere Hochrisikogruppe, da sie im jungen Erwachsenenalter signifikant häufiger Risikoverhalten zeigten.

Diskussion: Die Ergebnisse machen die Komplexität der Entwicklung psychischer Gesundheit im Zusammenhang mit dem Einfluss von Risiko- und Schutzfaktoren bei jungen Menschen deutlich. Insgesamt trägt die Arbeit wesentlich zum Verständnis der psychischen Gesundheit in vulnerablen und allgemeinen Bevölkerungsgruppen bei und bietet wichtige Ansatzpunkte für die Früherkennung sowie für Präventions- und Interventionsprogramme.

XI Declaration of Own Contribution to the Publications

Publication 1

Klasen, F., Petermann, F., Meyrose, A.-K., Barkmann, C., Otto, C., **Haller, A-C.,** Schlack, R., Schulte-Markwort, M., & Ravens-Sieberer, U. (2016). Verlauf psychischer Auffälligkeiten von Kindern und Jugendlichen: Ergebnisse der BELLA-Kohortenstudie [Trajectories of mental health problems in children and adolescents: Results of the BELLA cohort study]. *Kindheit und Entwicklung, 25*(1), 10–20.

As author of this publication, I contributed primarily by assisting with data curation and data collection and thoroughly reviewing the manuscript. While I was not involved in the initial conceptualisation and data analysis, I assisted with the manuscript preparation and provided important feedback on the manuscript drafts to improve clarity and accuracy. I supported the research team by helping ensure the quality and completeness of the data, and I collaborated with co-authors throughout the revision process.

Publication 2

Plass, A.*, **Haller, A-C.***, Otto, C., Barkmann, C., Wiegand-Grefe, S., Hölling, H., Schulte-Markwort, M., Ravens-Sieberer, U., & Klasen, F. (2017). Parents with mental health problems and their children in a German population-based sample: Results of the BELLA study. *PLOS ONE, 12*(7), e0180410. https://doi.org/10.1371/journal.pone.0180410

As shared first author of this publication, I contributed substantially to all major aspects of the research and manuscript preparation. Specifically, I co-authored the conceptualisation and development of the manuscript. I was primarily responsible for conducting a comprehensive literature review to inform the study framework and co-developed the formulation of the research questions and hypotheses. I co-authored the design of the statistical analyses and was primarily responsible for the data preparation and the execution of the statistical analyses. I closely collaborated with my co-author regarding the interpretation of the results, and co-authored the manuscript, with particular involvement in writing the introduction, methods, results and discussion sections. I furthermore collaborated closely with the co-first author during all phases of the writing, feedback, and peer review and revision process.

Publication 3

Plass, A.*, **Haller, A-C.***, Habermann, K., Barkmann, C., Petermann, F., Schipper, M., Wiegand-Grefe, S., Hölling, H., Ravens-Sieberer, U., & Klasen, F. (2016). Faktoren der Gesunderhaltung bei Kindern psychisch belasteter Eltern: Ergebnisse der BELLA-Kohortenstudie [Factors promoting mental health in children of parents with mental health problems: Results of the BELLA cohort study]. *Kindheit und Entwicklung, 25*(1), 41–49.

As shared first author of this publication, I contributed substantially to all major aspects of the research and manuscript preparation. Specifically, I co-authored the conceptualisation and development of the manuscript. I was primarily responsible for conducting a comprehensive literature review to inform the study framework and co-developed the formulation of the research questions and hypotheses. I co-authored the design of the statistical analyses and was primarily responsible for the data preparation and the execution of the statistical analyses. I closely collaborated with my co-author regarding the interpretation of the results, and co-authored the manuscript, with particular involvement in writing the introduction, methods, results and discussion sections. I furthermore collaborated closely with the co-first author during all phases of writing, feedback, and peer review and revision process.

Publication 4

Haller, A-C., Klasen, F., Petermann, F., Barkmann, C., Otto, C., Schlack, R., & Ravens-Sieberer, U. (2016). Langzeitfolgen externalisierender Verhaltensauffälligkeiten: Ergebnisse der BELLA-Kohortenstudie [Long-term consequences of externalized mental health problems: Results of the BELLA cohort study]. *Kindheit und Entwicklung, 25*(1), 31–40.

As the first author of this publication, I contributed substantially to all major aspects of the research and manuscript preparation. Specifically, I authored the conceptualisation and development of the manuscript. I was responsible for conducting a comprehensive literature review to inform the study framework and developed the formulation of the research questions and hypotheses, taking in the feedback the other authors. I authored the design of the statistical analyses and was responsible for the data preparation and the execution of the statistical analyses. I closely collaborated with the co-authors regarding the interpretation of the results, and authored the manuscript. I wrote the introduction, methods, results and discussion sections. I collaborated closely with the other authors during all phases of the writing, feedback, and peer review and revision process.

Publication 5

Otto, C.*, **Haller, A.***, Barkmann, C., Klasen, F., & Ravens-Sieberer, U. (2017). Risk and protective factors of health-related quality of life in children and adolescents: Results of the longitudinal BELLA study. *PLOS ONE.* https://doi.org/10.1371/journal.pone.0190363

As shared first author of this publication, I contributed substantially to all major aspects of the research and manuscript preparation. Specifically, I co-authored the conceptualisation and development of the manuscript. I was primarily responsible for conducting a comprehensive literature review to inform the study framework and co-developed the formulation of the research questions and hypotheses. I co-authored the design of the statistical analyses. I closely collaborated with my co-author regarding the interpretation of the results, and co-authored the manuscript, with particular involvement in writing the introduction, methods, and discussion sections. I furthermore collaborated closely with the co-first author during all phases of writing, feedback, and peer review and revision process.

XII Comprehensive List of Publications by A-C. Haller[23]

Peer-Reviewed Publications

2023

Devine, J., Kaman, A., Seum, T., Zoellner, F., Dabs, M., Ottova-Jordan, V., Schlepper, L., **Haller, A-C.**, Topf, S., Boecker, M., Schuchard, J., Forrest, C., & Ravens-Sieberer, U. (2023). German translation of the PROMIS® pediatric anxiety, anger, depressive symptoms, fatigue, pain interference and peer relationships item banks. *Journal of Patient-Reported Outcomes, 7*(1), 16.

2018

Devine, J., Schröder, P., Metzner, F., Klasen, F., Moon, J., Herdman, M., Hurtado, M., Castillo, G., **Haller, A-C.**, Correia, H., Forrest, C., & Ravens-Sieberer, U. (2018). Correction to: Translation and cross-cultural adaptation of eight pediatric PROMIS® item banks into Spanish and German. *Quality of Life Research, 27*(11), 3057.

2017

Klasen, F., Reiß, F., Otto, C., **Haller, A-C.**, Meyrose, A., Barthel, D., & Ravens-Sieberer, U. (2017). Die BELLA-Studie – das Modul zur psychischen Gesundheit in KiGGS Welle 2. *Journal of Health Monitoring, 2*(S3), 55–65.

Otto, C.*, **Haller, A-C.***, Klasen, F., Hölling, H., Bullinger, M., & Ravens-Sieberer, U. (2017). Risk and protective factors of health-related quality of life in children and adolescents: Results of the longitudinal BELLA study. *PLOS ONE, 12*(12), e0190363.

Plass-Christl, A.*, **Haller, A-C.*,** Otto, C., Barkmann, C., Wiegand-Grefe, S., Hölling, H., Schulte Markwort, M., Ravens-Sieberer, U., & Klasen, F. (2017). Parents with mental health problems and their children in a German population-based sample: Results of the BELLA study. *PLOS ONE, 12*(7), e0180410.

2016

Haller, A-C., Klasen, F., Petermann, F., Barkmann, C., Otto, C., Schlack, R., & Ravens Sieberer, U. (2016). Langzeitfolgen externalisierender Verhaltensauffälligkeiten: Ergebnisse der BELLA-Kohortenstudie. *Kindheit und Entwicklung, 25*(1), 31–40.

[23] Shared first authorship is indicated by an asterisk (*)

Inhestern, L., **Haller, A-C.,** Wlodarczyk, O., & Bergelt, C. (2016). Psychosocial interventions for families with parental cancer and barriers and facilitators to implementation and use – A systematic review. *PLOS ONE, 11*(6), e0156967.

Klasen, F., Petermann, F., Meyrose, A., Barkmann, C., Otto, C., **Haller, A-C.,** Schlack, R., Schulte-Markwort, M., & Ravens-Sieberer, U. (2016). Verlauf psychischer Auffälligkeiten von Kindern und Jugendlichen: Ergebnisse der BELLA-Kohortenstudie. *Kindheit und Entwicklung, 25*(1), 10–20.

Plaß-Christl, A.*, **Haller, A-C.***, Habermann, K., Barkmann, C., Petermann, F., Schipper, M., Wiegand-Grefe, S., Hölling, H., Ravens-Sieberer, U., & Klasen, F. (2016). Faktoren der Gesunderhaltung bei Kindern psychisch belasteter Eltern: Ergebnisse der BELLA-Kohortenstudie. *Kindheit und Entwicklung, 25*(1), 41–49.

Conference Presentations

2016

Haller, A.-C., Otto, C., Klasen, F., Barkmann, C., & Ravens-Sieberer, U. (2016, October 19-22). Risk and protective factors of health-related quality of life in children and adolescents: Results of the longitudinal BELLA study. *Poster presented at the 23rd International Conference of the International Society for Quality of Life Research (ISOQOL)*, Copenhagen, Denmark.

2015

Haller, A.-C., Klasen, F., Otto, C., Nolte, S., Mierke, A., Barthel, D., Ellert, U., Hölling, H., Rose, M., & Ravens-Sieberer, U. (2015, October 21-24). First results from the longitudinal mental health module of the German National Health Interview and Examination Survey among children and adolescents. *Paper presented at the 22nd International Conference of the International Society for Quality of Life Research (ISOQOL)*, Vancouver, Canada.

Plass, A.* & **Haller, A.-C.*** (2015, March 4-7). Kinder psychisch belasteter Eltern in Deutschland – Risiko- und Resilienzfaktoren in einer Bevölkerungsstichprobe – Daten der BELLA-Studie [Children of mentally distressed parents in Germany – Risk and protective factors in a population sample – Data from the BELLA study]. *Paper presented at the 34th Congress of the German Society for Child and Adolescent Psychiatry, Psychosomatics, and Psychotherapy (DGKJP)*, Munich, Germany.

2014

Haller, A.-C., Klasen, F., Habermann, K., Ravens-Sieberer, U., & Plaß-Christl, A. (2014, May 7 - 10). Determinants of resilience in children of parents with mental health problems. *Paper presented at the 2nd World Congress on Resilience: From Person to Society*, Timişoara, Romania. (Partially funded by the organiser due to invitation).

Haller, A.-C., Klasen, F., Reiß, F., Hölling, H., Ravens-Sieberer, U., & Plaß-Christl, A. (2014, September 11-14). Kinder von psychisch belasteten Eltern in Deutschland: Epidemiologische Daten aus der BELLA-Studie [Children of parents with mental health problems in Germany: Epidemiological data from the BELLA study]. *Paper presented at the 110th Annual Meeting of the German Society for Pediatrics and Adolescent Medicine (DGKJ)*, Leipzig, Germany.

XIII Curriculum Vitae

Der Lebenslauf wurde aus datenschutzrechtlichen Gründen entfernt.

XIV Statutory Declaration / Eidesstattliche Versicherung

Ich versichere ausdrücklich, dass ich die Arbeit selbständig und ohne fremde Hilfe, insbesondere ohne entgeltliche Hilfe von Vermittlungs- und Beratungsdiensten, verfasst, andere als die von mir angegebenen Quellen und Hilfsmittel nicht benutzt und die aus den benutzten Werken wörtlich oder inhaltlich entnommenen Stellen einzeln nach Ausgabe (Auflage und Jahr des Erscheinens), Band und Seite des benutzten Werkes kenntlich gemacht habe. Das gilt insbesondere auch für alle Informationen aus Internetquellen.
Soweit beim Verfassen der Dissertation KI-basierte Tools („Chatbots“) verwendet wurden, versichere ich ausdrücklich, den daraus generierten Anteil deutlich kenntlich gemacht zu haben. Die „Stellungnahme des Präsidiums der Deutschen Forschungsgemeinschaft (DFG) zum Einfluss generativer Modelle für die Text- und Bilderstellung auf die Wissenschaften und das Förderhandeln der DFG“ aus September 2023 wurde dabei beachtet.
Ferner versichere ich, dass ich die Dissertation bisher nicht einem Fachvertreter an einer anderen Hochschule zur Überprüfung vorgelegt oder mich anderweitig um Zulassung zur Promotion beworben habe.
Ich erkläre mich damit einverstanden, dass meine Dissertation vom Dekanat der Medizinischen Fakultät mit einer gängigen Software zur Erkennung von Plagiaten überprüft werden kann.

Datum Unterschrift