Depression and role functioning
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1. General Introduction
The World Health Organization (WHO) states that mental health is “a state of well-being in which an individual realises his or her own abilities, is able to cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community”.¹ This implies that mental health is the foundation, or at least one of the foundations, for individual well-being and functioning. Moreover, it implies that mental disorders (psychopathology) have a great negative impact on individuals’ well-being and functioning. One of the most common mental disorders is major depression. In this PhD thesis, we investigate the association between major depressive disorder and depressive problems on the one hand, and impairments in role functioning and disability during adolescence and adulthood on the other hand. In this thesis, we define depression as major depressive disorder (MDD) according to strict criteria, whereas depressive problems comprise a continuous measure of depressive symptoms. When we use the term ‘depression’, we mean both MDD and depressive problems.

**Depression: a national and global burden of disease**

The last version of the Global Burden of Disease analyses of the WHO² showed that MDD is the third leading cause of disability worldwide at all ages, at the eighth place in low-income countries, and taking the first place in middle- and high-income countries. In the Netherlands, MDD is the fourth leading cause of disability among 56 selected major diseases at all ages.³ Almost nineteen percent of the Dutch adult population is diagnosed with MDD at one point in their life. This lifetime prevalence is higher among females (24.3%) than among males (13.1%).⁴ Among Dutch adolescents, the lifetime prevalence of MDD was not recently measured. However, worldwide the lifetime prevalence of MDD among adolescents (until 20 years of age) was estimated to be between 15-20%. This is a prevalence that is comparable to the lifetime prevalence of adults, which suggests that depression may often have its onset during adolescence.⁵,⁶

To diagnose MDD in adults, criteria from the Diagnostic and Statistical Manual of Mental Disorders version IV (DSM-IV) are used.⁷ According to these criteria, persons who suffer from MDD must have at least one of the core depressive symptoms (i.e., either depressed mood or loss of interest or pleasure in daily activities) and in total five or more depressive symptoms, including also other symptoms such as markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day; significant weight loss when not dieting or weight gain, or decrease or increase in appetite nearly every day; or recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide. Finally, the symptoms need to be present most of the day, nearly every day, for at least two weeks and must cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.
The diagnostic criteria of MDD in children and adolescents are similar to those in adults. However, recognition and diagnosis in this group is more difficult as the symptoms may be expressed differently, varying on the developmental period the child is in. Furthermore, it may be hard for children to describe their feelings and mood. In adolescents, MDD is often associated with behavioural problems.

Depression, impaired role functioning, and disability in adults and adolescents

It is well established that MDD and depressive problems (both further referred to as depression) are associated with impaired role functioning or disability in both adults and adolescents. This disability can be defined as “any restriction or lack of capacity to perform an activity in a manner or within a range considered normal for a human being”, and disability due to depression can occur in multiple domains of functioning. Examples of functioning that is impaired by depression are daily functioning such as self-care and household functioning; social functioning and participation in society; work functioning in adults; and academic performance in adolescence. Although a substantial amount of studies has focused on the relation between depression and role functioning disability, there are still gaps in the current knowledge. It is, for example, unknown if there are factors (i.e., illness, personal, and environmental factors) that moderate the association between depression and role functioning and if there are differences between adolescent boys and girls.

In adolescents, depressive problems predict later problems in functioning, while functional problems predict later depressive problems as well. However, the bidirectional relationship between the two remains unclear; do in particular depressive problems cause poor functioning, is it the other way around, or are the effects equally strong? It is also uncertain whether depressive and functional problems in late childhood carry a risk for similar problems in later adolescence and if this differs between girls and boys. Subsequently, depressive problems are not the only mental health problems during adolescence that affect, or are affected by, functioning; other prevalent problems are anxiety disorder, attention-deficit hyperactivity disorder (ADHD), and behavioural problems (i.e., opposite defiant disorder [ODD] and conduct disorder [CD]). It is not studied how large the role of depressive problems is over and above other types of mental health problems in adolescents, and which type of problems affects which type of functioning most.

In adults, severity of MDD and disability show synchrony of change during the course of the illness. That is, when depression severity decreases, disability decreases and functioning improves. Nonetheless, there are still individuals who function surprisingly well despite the presence of a severe depression, such as MDD. The question that rises here is: what explains this heterogeneity in disability of patients with MDD? Because persons suffering from MDD differ greatly in symptom characteristics, such as severity of depressive
symptoms, recurrence, and age of onset, it is possible that individual characteristics of MDD and comorbid mental disorders account for the heterogeneity in MDD-associated disability.

**Theoretical frameworks to explain the association between depression and disability**

The model of the International Classification of Functioning, Disability, and Health (ICF) illustrates the existence of an association between depression and disability, and provides a basis for the understanding of heterogeneity in depression-associated disability. Although the model was originally designed for use in adults, it may also be applied to adolescents. The ICF views disability as the outcome of interactions between health conditions and contextual characteristics (Figure 1). Among the health conditions are diseases, disorders and injuries including depression; among the contextual characteristics are personal and environmental characteristics.

The assumption that personal and environmental characteristics are important to understand individual differences in disability, over and above illness characteristics, makes it plausible that personal and environmental characteristics account for heterogeneity in disability in adults with MDD. Personal characteristics are defined as the particular conditions of an individual’s life and living, and are not classified in the ICF because of large social and cultural variance in these characteristics. However, the ICF offers some examples of personal characteristics that include gender, age, coping styles, social background, education, profession, overall behaviour pattern, personality, and other characteristics that are assumed to influence how disability is experienced by the individual. Environmental characteristics constitute the physical and social environment in which people live their lives.

**Figure 1. The hypothesized model associating depression and disability, (partly) based on the International Classification of Functioning, Disability, and Health (ICF).**

![Diagram](image-url)
In the opposite direction, the competency-based model of depression is a model that describes the mechanism underlying the prospective relationship between poor performance in several domains of functioning and later depressive problems (Figure 2). This model is developed for adolescents, and asserts that adolescents who perform poorly in one or more domains of functioning may receive negative feedback from others, which can trigger the risk of depressive problems. According to this theory, adolescents learn to base their self-perception on the way they are regarded by others. If children are negatively regarded by others, they may tend to adopt this negative view which results in a negative self-perception. This negative self-perception may increase the risk of depressive problems among these poorly functioning children.

Figure 2. The hypothesized model associating poor functioning and depression in adolescents, based on the competency-based model of depression.

**Disentangling depression and disability: why it is important**

As depression is an important health burden with large effects on various domains of role functioning, it is important to extend the current knowledge on this association. Insight into the relation between depression and functioning may contribute to improvement of preventions or interventions for disability among persons with depression in several ways. First, research on risk factors of disability among depressed persons can be used to identify subgroups of persons that are at risk for more severe disability than others, or are at risk of slower or incomplete recovery of functioning after the depressive episode. Consequently, these persons should be monitored more closely to decrease the impact of depression on their role functioning. In addition, efforts can be made to reduce or remove the burden of the identified risk factors. Furthermore, it is informative to analyse which dimensions of functioning are most severely affected by depression, so that interventions can target these specific areas of functioning. Information about bidirectional relationships between depression and functioning is valuable in assessing whether preventions or interventions should be targeted at depression or impairments in functioning in the first place. Finally, longitudinal analyses can provide information on long-term effects of depression on functioning, providing the opportunity to address the needs of the persons who are at risk of future functional impairments.
The TRAILS and NESDA study

In this thesis we used data from two different studies: the TRacking Adolescent’s Individual Lives Survey (TRAILS) and the Netherlands Study of Depression and Anxiety (NESDA).

To study depressive problems and functioning during adolescence, we used data from TRAILS; a prospective cohort study of Dutch preadolescents who are followed biennially until they are at least 25 years old. The TRAILS target sample consisted of preadolescents who lived in five municipalities in the northern part of the Netherlands during their recruitment at age 10, including both urban and rural areas. A detailed description of the study design, sampling procedures, data collection, and measures of the TRAILS study can be found in De Winter et al.\textsuperscript{34} and Huisman et al.\textsuperscript{35} In TRAILS, we administered symptom measures, including an inventory of depressive problems, to the adolescents, their parents, and teachers at the first three assessment waves, but we did not conduct psychiatric diagnostic interviews. Hence, we analyse multi-informant data of depressive problems of the adolescent, but we do not study psychiatric diagnoses.

To study heterogeneity in disability of adult patients with MDD, we used data from NESDA; an on-going multi-centre longitudinal cohort study including 2981 individuals (18-65 years) with current or remitted depressive and/or anxiety disorder, patients at risk due to family history or subthreshold symptoms, and healthy controls. Participants were recruited at three locations in the Netherlands, in three different settings: the general population, primary care, and mental health care. The aim of NESDA is to investigate the long-term course and consequences of depression and anxiety disorders. The rationale, objectives, and methods of NESDA have been described by Penninx and colleagues.\textsuperscript{36} The studies in this thesis were based on data from patients with a diagnosis of major depressive disorder at the first measurement wave. In NESDA, major depressive disorder was diagnosed using the Composite International Diagnostic Interview (CIDI), a structured interview according to the psychiatric DSM-IV criteria.\textsuperscript{37}

This PhD thesis

The main aim of this PhD thesis is to contribute to disentangling the complex relation between depressive problems and functioning in both adolescents and adults. This thesis consists of two parts.

Part one: depressive problems and role functioning in adolescents

In the first part of this thesis, the association between depressive problems and functioning in adolescents is investigated. Although previous research showed that psychopathology during adolescence is associated with poor functioning at school, a number of important issues need further exploration. Hence, we study the unique association between specific
dimensions of psychopathology (depression, anxiety, ADHD, ODD, and CD) and specific domains of functioning (academic performance, social well-being, and social preference). This study is described in Chapter 2. In addition, we study whether there were differences in the established associations depending on gender or the informant of the adolescent’s psychopathology. The study was conducted cross-sectionally.

In Chapter 3, we focus on the -in chapter 2 established- association between adolescents’ depressive problems and functioning, but now in a longitudinal perspective. In this study (age 11 to 16 years old), we investigate the bidirectional effects between depressive problems and academic performance, social well-being, and social preference over time. We also take gender differences into account.

Part two: explaining heterogeneity in disability associated with major depressive disorder in adults

In the second part of this thesis, heterogeneity in disability with MDD in adults is investigated. Chapter 4 and 5 describe two cross-sectional studies in which we studied multiple characteristics that may explain why in some depressed persons functioning is more affected than in others. In Chapter 4, we focus on the effect of illness characteristics and comorbid mental disorders, while in Chapter 5 we focus on the additional effects of personal and environmental characteristics. Both studies are based on NESDA data.

Given that synchrony of change between depression severity and disability is not found in all patients, we study in Chapter 6 which factors determine to what extent reductions in depressive symptoms over time were accompanied by reductions in disability. In this study, potential moderators of the synchrony of change are based on the findings of the studies described in chapter four and five. We use 3-year longitudinal data from the NESDA study.
References


