

# SUMMARY

Depressive and anxiety disorders are prevalent disorders. Approximately 16.0% of all people suffers from a major depressive disorder at some point in life. For anxiety disorders this is 20.0%. Obviously, percentages are lower for specific types of anxiety disorders, but are still considerably high. For example, 5.1% of the general population ever suffers from a panic disorder, and 12.1% from social phobia. Depressive and anxiety disorders not only have a high impact on the personal life of patients (such as experiencing a lower quality of life, more somatic diseases and a higher chance of dying from suicide), but also on society in general (such as less productivity at work and more absenteeism from work).

Sleep is one of the factors which has a strong relationship with depressive and anxiety disorders. Every human spends a great deal of life sleeping, and also needs sleep to function well. Disturbed sleep can consist of insomnia (insufficient quality of sleep), but can also consist of a disturbed sleep duration. In general, a sleep duration of 7-9 hours is considered normal. Sleep is not only influenced by mental health, but also by many other factors, such as somatic health, experiencing pain and using medication. The goal of this thesis is to gain more insight in the relationship between sleep, depression and anxiety. We use data from the NESDA-study (Netherlands Study of Depression and Anxiety), a large epidemiological cohort study. The fact that the presence of psychiatric diagnoses is based on the DSM-IV, a psychiatric classification system which is also used in clinical practice, is one of the major advantages of this study.

A general introduction and the main research questions are provided in **chapter 1**. In **chapter 2**, we examine the association between sleep and depressive and anxiety disorders. It is known from previous research that these factors are related, however not all previous studies also regard other factors which possibly influence or disturb sleep, such as socio-demographic factors (age, gender), somatic health (chronic diseases, pain) and use of medication. We found that current depressive and current anxiety disorders are associated with insomnia, and both short and long sleep duration. In our study, the associations are stronger for depressive than for anxiety disorders. Also, individuals who suffered from a depressive disorder in the past, reported more insomnia and more often a short sleep duration (compared to individuals who never suffered from depressive or anxiety disorders). The associations did not disappear after adjusting for socio-demographic and health factors, which implies that these factors do not explain the associations.

The relationship between a disturbed sleep and work functioning is examined in **chapter 3**, both for individuals with and without current depressive and anxiety disorders. In subjects with current depressive and anxiety disorders, insomnia and a short sleep duration are related to diminished work performance and longstanding absenteeism from work (> 2 weeks). This relationship is not explained for by severity of depressive symptoms. This suggests that diminished work functioning is not an indicator of severity of the underlying depressive/ anxiety disorder, but really has to do with disturbed sleep itself. The relationship between disturbed sleep and work functioning is not found in individuals without current depressive or anxiety disorders. Possibly these subjects can better cope with the effects of a disturbed sleep, than subjects who are suffering from depressive and anxiety disorders.

The predictive effect of disturbed sleep on the presence of depressive or anxiety disorders two years later is examined in **chapter 4**. We used data from 565 individuals who never suffered from depressive or anxiety disorders in their life. This ensures that we really examine the effect of disturbed sleep on onset of depressive and anxiety disorders. The results point to both insomnia and a short sleep duration being a risk factor in developing depressive and anxiety disorders two years later. Therefore, it seems plausible that a disturbed sleep in itself contributes to the development of these disorders.

In **chapter 5**, we examine in 1069 persons with (current) depressive and anxiety disorders if a disturbed sleep influences the course of these disorders. We find that both a short and long sleep duration are associated with a chronic course of depressive and anxiety disorders, even if we correct for the severity of the psychiatric symptoms. Insomnia does not predict a chronic course, its effect is explained for by severity of the underlying disorder.

**Chapter 6** takes a look at the relationship of chronotype (being a morning- over eveningness type) with depressive and anxiety disorders. It seems that certain chronotypes (the late chronotype, or being an evening type) are related to developing depressive disorder. The results of our study indeed found support for the fact that people who are suffering from current depressive or anxiety disorders more often have a late chronotype, and these results are independent of sociodemographic factors, other aspects of mental health, or sleep factors. Further research needs to be done to decide if a late chronotype really is a risk factor for developing depressive and anxiety disorders. We comment on the findings of this thesis in **chapter 7**.

The results of this thesis are a stepping stone for further research on the relationship between sleep, depression and anxiety disorders. For example, it can be examined if a more objective measurement of sleep in a sleep laboratory explains why a disturbed sleep leads to developing depressive and anxiety disorders. Also, more research needs to be done why a disturbed sleep leads to a worse course of depressive and anxiety

disorders, possibly by following these subjects for a longer period of time, measuring their sleeping pattern in a more detailed way (such as wearing a specialized watch at nighttime, which measures how long people really sleep), and by examining the underlying pathophysiological dysregulations. To summarize, we have shown that a disturbed sleep is related to depressive and anxiety disorders, and that there is a relationship with diminished work functioning. Also, a disturbed sleep is a risk factor for developing depressive and anxiety disorders, and the course of these disorders is worse if patients complain of both a short and long sleep duration. Depressive and anxiety disorders are also associated with a later chronotype. We advise clinicians who work with depressed and anxious patients to pay extra attention to sleeping problems, not only to insomnia and short sleep duration, but also to long sleep duration, given the fact that these all have negative effects on the course and consequences of depressive and anxiety disorders.