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**High Incidence of Depression and Anxiety in Offspring of Depressed and/or Anxious  
Parents: An Exploration of the Effect of Age and Gender on Individual Symptoms**

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### Abstract

Depression and anxiety disorders are complex disorders transmitted intergenerationally. Age and gender play a role in their transmission among the general population, with adolescent girls presenting an increased likelihood of relevant symptomatology. However, not much is known about the effect of age and gender on offspring population yet. The current study investigated whether age is positively related to the number of depressive/anxiety symptoms (*hypothesis 1*) and whether the positive association of age with the number of depressive/anxiety symptoms is stronger in girls than in boys (*hypothesis 2*). To test these hypotheses, a symptom-specific approach of the disorders was adopted and associations with individual symptoms were also explored. Data from the “Adolescents at Risk of Anxiety and Depression: A Neurobiological and Epidemiological approach” (ARIADNE) study, consisting of 522 Dutch offspring of patients receiving treatment for depression and/or anxiety disorders, was used. Contrary to expectation, age was not related to the overall number of symptoms and was only related to two specific somatic/sleep symptoms, “I have low energy for no reason” and “I often lie awake for hours before falling asleep”. Unexpectedly, gender did not moderate the association between age and number of symptoms. Overall, the lack of significance may be due to the narrow age range of the sample. Nonetheless, the significance of the two energy-related symptoms highlights the need to investigate the role of energy in the development of depression and anxiety disorders.

*Keywords:* offspring of depressed and/or anxious parents, depression and/or anxiety disorders, individual symptoms, age, gender

### **High Incidence of Depression and Anxiety in Offspring of Depressed and/or Anxious Parents: An Exploration of the Effect of Age and Gender on Individual Symptoms**

Depressive and anxiety disorders also referred to as emotion disorders are highly common and devastating for numerous individuals and society at large (Kessler et al. 2003; Vos et al., 2015). According to the World Health Organization, the total number of people living with depression has been estimated to reach 322 million while anxiety diagnoses have also reached 264 million. The lifetime prevalence of emotion disorders has been estimated to reach 16.2% for depressive disorders and 28.8% for anxiety disorders, (Kessler et al., 2005). However, it should be noted that an additional 11% of the world's population is characterized by "sub-clinical" depressive and anxiety issues, that although do not meet DSM-IV criteria are also harmful and pervasive (Kessler et al., 1994; Lim et al., 2018).

Depression is distinguished by an overall low mood and/or loss of interest in almost all normal activities as well as sleep disturbances, vegetative symptoms such as reduced appetite, slowed thinking, and emotional disturbances such as feelings of worthlessness, guilt, and anger (American Psychiatric Association, 2017). Anxiety is characterized by a tendency to worry about the future and to be on the lookout for potential danger which is accompanied by self-preserving behaviors like behavioral avoidance as well as somatic symptoms such as nausea and dizziness (Landman-Peeters, 2007; Sekula et al., 2003). Although depression and anxiety are distinct disorders, they share several risk factors and frequently cooccur (American Psychiatric Association, 1994; Cramer et al., 2010) with the comorbidity between the disorders being estimated between 40% and 60% (Hettema, 2008). In addition, depression and anxiety symptoms have been shown to reinforce each other and share commonalities as well as contribute to the development of the opposite disorder (McElroy et al., 2018). Given the overlap of risk factors and symptoms between emotion disorders, it is suggested that

besides being highly comorbid, they also tend to run in the same families (Hettema, 2008; Landman-Peeters, 2007).

A substantial body of literature supports the familial accumulation of psychiatric disorders, indicating that the offspring of similarly afflicted parents have an increased risk of developing psychiatric disorders themselves (Bijl et al., 2002; Kendler et al. 1997; Kessler et al. 1997; Merikangas et al. 1994). Regarding emotion disorders, various correlational, longitudinal, and experimental studies indicate that parental depression and/or anxiety is one of the strongest predictors for developing a similar condition with a two-to-three-fold increase when compared with controls of non-depressed/anxious parents in the long-term (Havinga et al., 2016; Landman-Peeters, 2007; Mars et al., 2012; Weissman et al., 2006). Since depression and anxiety are dependent upon multiple factors, the explanation behind the high numbers of offspring psychopathology is difficult to completely uncover (Landman-Peeters, 2007; Mars et al., 2012). In addition, despite the robust association found between parental depression and offspring psychopathology, not all offspring experience similar problems to their parents (Mars et al., 2012). Overall, adoption and twin studies suggest that both inherited and environmental factors play a role in the increased risk of emotion disorders in offspring of depressed and/or anxious parents (Harold et al., 2010; Silberg et al., 2010; Tully et al., 2008) and multiple mechanisms have been proposed to explain the cross-generational transmission of depression (Mars et al., 2012). These could include impaired parenting, difficult parent-child relationships, increased conflict, high levels of family stress, dysfunctional neuroregulatory mechanisms, and exposure to negative parental cognitions, behavior and affect as well as a genetic predisposition (Mars et al., 2012). Since not much is understood though about the exact mechanisms through which emotion disorders are transmitted to offspring, looking into the age where symptomatology develops as well as any

potential gender differences would be a valuable means of gaining a better understanding of the transmission process.

### **The Role of Age**

Previous research has consistently shown age to affect the development of depression and anxiety, especially in relation to individual symptoms (Hankin & Abramson, 2001; Schaakxs et al., 2016). More specifically, before the occurrence of adolescence, both anxiety and depression rates are relatively low while between the ages of 13 to 15, a significant increase in anxious and depressive symptoms occurs (Hankin & Abramson, 2001; Thompson et al., 2021). Moreover, regarding individual symptoms, young people indicate an overall tendency to feel more anxious and irritable as well as an inability to regulate feelings of sadness (Schaakxs et al., 2016; Schaakxs et al., 2017; Thompson et al., 2021). On the contrary, older individuals have reported an increased occurrence of somatic and vegetative symptoms of depression and anxiety, such as fatigue, psychomotor agitation, early morning awakening or aches as well as trouble with sleeping (Schaakxs et al., 2016; Schaakxs et al., 2017). Lastly, older individuals have been shown to worry more about health-related issues and indicate anxiety symptoms related to their health concerns (Thompson et al., 2021). While there is existing evidence about the overall progression of depression and anxiety symptoms in community samples, no prior study as far as we are aware, has specifically explored this phenomenon in a high-risk offspring population. Therefore, the primary goal of our study is to investigate whether age impacts the number of symptoms offspring of depressed and/or anxious parents display.

### **The Role of Gender**

Female gender is also a well-known and robust predictor of both depression and anxiety, since about twice as many women than men suffer from emotion disorders and daughters are more likely to inherit emotion disorders from their affected parents (Havinga et

al., 2016; Landman-Peeters, 2007; Mathew et al., 2011). Especially in relation to age, gender has been shown to affect the course of depressive and anxiety disorders (Altemus et al., 2014; Bennett et al., 2005; Hankin & Abramson, 2001). Although prior to puberty, depression and anxiety rates are low and similar for boys and girls, during adolescence their rates peak, with females having an even greater increase and acquiring double the rate of male depression and anxiety (Altemus et al., 2014; Hankin & Abramson, 2001; Kessler et al., 1994). This gap between the genders is evident from early puberty, between the ages of 12 and 14, but intensifies in late adolescence and continues into early adulthood (Hankin and Abramson, 2001; Twenge and Nolen-Hoeksema, 2002; Wade et al., 2002). Regarding specific symptoms, young women are more likely to report somatic symptoms such as little energy and weight/appetite problems as well as increased worry and difficulty controlling it (Thompson et al., 2021). These age- and gender-related differences have been theorized to be a result of the abundance of objective and subjective stressors that adolescent girls experience in comparison to boys, such as intrapersonal conflicts, and eating problems, but the exact mechanisms of their effect remain unknown (Altemus et al., 2014; Hankin et al., 2007).

However, no studies to our knowledge have examined the role of age in combination with gender in offspring population. This hinders our understanding of how depression and anxiety disorders manifest and progress in individuals who are at heightened risk. By not addressing this specific population, important insights into the early identification, prevention, and targeted intervention strategies will be neglected. Moreover, offspring of afflicted parents are likely to differ in their results in relation to age and gender from the general population due to a variety of factors such as genetic vulnerability, exposure to parents' problematic cognitions, behaviors, and affect as well as exposure to a stressful environment (Landman-Peeters, 2007). Thus, we also aim to explore if age in combination with gender affects the presence of emotion disorders among offspring.

### **The Value of a Symptom-Specific Approach**

To uncover the mechanisms through which depression and/or anxiety are developed among offspring of depressed and/or anxious parents, it may be helpful to adopt a symptom-specific view of the disorders. This would mean that individual symptoms are separate factors with autonomous causal relevance (Bijl et al., 2002; Boschloo et al., 2016; Fried et al., 2013). This approach is especially helpful in identifying causal associations and patterns between different risk factors and symptoms that cannot be identified when considering clusters of symptoms (Fried et al., 2013). This approach is supported by various studies such as Lux and Kendler's (2010) cross-sectional study which concluded that individual depressive symptoms had autonomous causes, as well as Boschloo's et al. (2016) study that found subthreshold depressive symptoms being differentially associated with the onset of depression. So, besides examining the overall number of symptoms, an exploration of the association of individual symptoms is also valuable to further contribute to the unveiling of the process through which depression and anxiety may develop among offspring.

### **The Current Study**

Overall, our study aims to uncover the complicated process through which age, in combination with gender, affects the transmission of depression and/or anxiety among offspring of patients receiving specialized treatment for depressive and/or anxiety disorders. To achieve this, 522 Dutch offspring were sampled from the baseline data collection of "Adolescents at Risk of Anxiety and Depression: A Neurobiological and Epidemiological approach" (ARIADNE). Based on previous research solidifying the effects of gender and age on the transmission of emotion disorders (Havinga et al., 2016; Landman-Peeters, 2007; Mathew et al., 2011), it was hypothesized that age is positively related to the number of depressive/anxiety symptoms (*hypothesis 1*) and that the positive association of age with the number of depressive/anxiety symptoms is stronger in girls than in boys (*hypothesis 2*). To

gain a better understanding of our hypotheses, we also explored whether age alone as well as in combination with gender was differentially related to individual symptoms of depression and anxiety.

## **Method**

### **Participants and Study Design**

The present study is based on baseline data from the ARIADNE cohort (starting in 2000). An estimated 65,000 medical files were searched to identify the eligibility of the potential participants. After two selection and exclusion sections the final 4,470 participants were chosen to whom invitations were sent via post. Regarding the exclusion criteria, most importantly patients that had been diagnosed with schizophrenia, schizoaffective disorder, or PTSD were excluded from the study. Some other exclusion criteria included not having children aged 13 to 25, insufficient Dutch fluency, having been assessed for judicial purposes only and, lack of a temporary address. Invitations were sent and 366 patients (i.e., as index parents) diagnosed with depression (90.7%) and/or anxiety disorders (72.6%) agreed to participate in the study together with their 522 offspring. The index parents were recruited from 16 psychiatric services in the three northern provinces of the Netherlands, where they had undergone specialized treatment for depressive and/or anxiety disorders which was a requirement for recruitment. The majority of parents and offspring (> 95%) were of Dutch descent.

All participants (i.e., index parents and their offspring) were interviewed by trained professionals using specified questionnaires for depression and anxiety disorders. The interviews were conducted either at the participant's home or at the Department of Psychiatry using the Composite International Diagnostic Interview (CIDI) WHO-2000 version (Alonso et al., 2002) to assess clinical depression and anxiety. The detailed description of the participants as well as the complete procedure of selection and recruitment can be seen on the



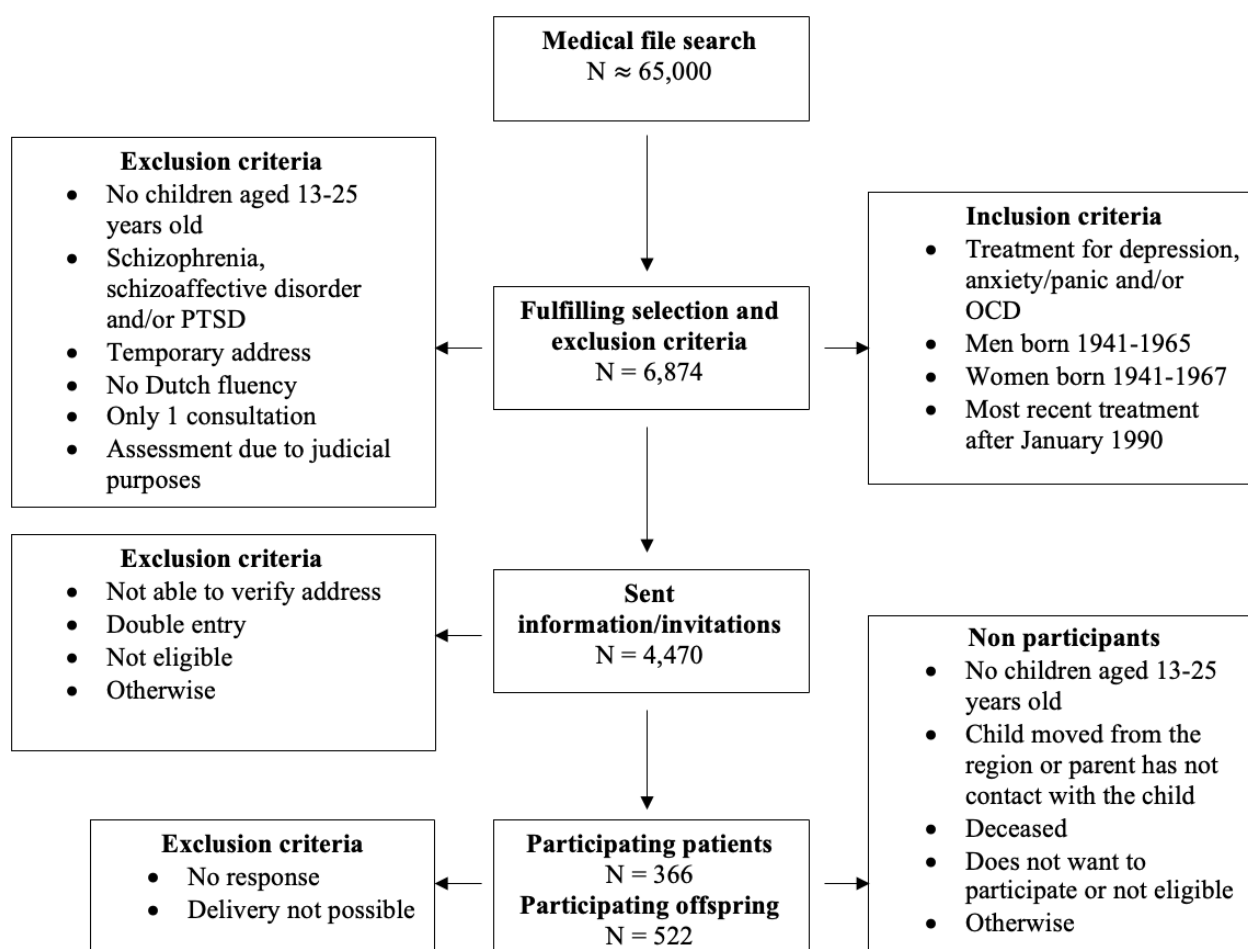
dissertation of Landman-Peeters (2007). Ethical approval for the ARIADNE study protocol was granted by the Medical Ethics Committee of the University Medical Centre Groningen in the Netherlands. In addition, informed consent was obtained from all participants (Havinga et al., 2017).

Out of the 522 offspring participants of the ARIADNE cohort, eight were excluded from the current study due to missing values on at least one of the key measures (i.e., age, gender, and several symptoms), leading to a final sample of 514 offspring between the ages of 13 and 26 ( $M = 18.12$ ,  $SD = .14$ , recruited between 2000 and 2002). A detailed description of the recruitment process for the study participants can be seen on Figure 1 below.

An a priori power analysis using G\*Power (version 3; Faul et al., 2007) was conducted. The sample sizes were computed at a power level of  $1 - \beta = .080$  and a 5% significance level, using two predictor variables. For a medium effect ( $f^2 = 0.15$ ) the required sample size was estimated at 68 and for a small effect ( $f^2 = 0.02$ ) at 485. Both requirements are fulfilled by the current sample. However, based on the literature as well as the large sample, at least a medium effect is expected (Faul et al., 2007).

**Figure 1**

*Flow chart of the recruitment procedure of ARIADNE*



## Measures

### *Depressive and anxiety disorder symptoms*

The presence of depressive and/or anxiety symptoms in the offspring was measured using the DSM-IV Questionnaire by Hartman (2002). For the assessment, 15 depression and anxiety items from Hartman's (2002) Questionnaire were selected which corresponded to individual symptoms of interest for the present study. More specifically, the symptoms included five general and physiological anxiety symptoms, four somatization and sleep symptoms, and six sad-affect depressive symptoms. Offspring were asked to indicate on a 4-point Likert-scale to what extent descriptions of symptomatic behavior accurately described

their behavior at the time of measurement or in the preceding twelve months (1 = *does not describe me* and 4 = *highly descriptive of me*). Items included, for example “I worry a lot”, “I often feel sad” and “I regularly suffer from nausea”. The responses were recoded into 0 = *absent* (score 1) and 1 = *present* (scores 2 to 4). A composite score was created to represent the number of symptoms each participant displayed with scores from 0 = *displaying no symptoms* to 15 = *displaying all the symptoms*. Previous research has indicated the internal consistency for the Depression scale at 0.92 and for the Anxiety scale at 0.88 (Landman-Peeters et al., 2005). In the current study, the internal consistency was estimated with the Cronbach’s alpha at  $\alpha = .88$ .

### **Statistical Analyses**

The statistical analyses were conducted using the IBM SPSS Statistics (version 28) (IBM Corporation, Armonk, N. Y., USA). Firstly, some descriptive analyses were conducted to gain an overall view of the characteristics of the sample. For continuous variables such as age, and the number of depressive/anxiety symptoms, the mean (M) and standard deviation (SD) were utilized. Categorical variables such as sex, and the presence or absence of individual symptoms were described using frequencies (N, %). A linear regression analysis was run between age and the number of depression and/or anxiety symptoms of the offspring (*hypothesis 1*) and 15 separate binary logistic regression analyses were conducted to examine whether age alone was related to the 15 individual symptoms of depression and anxiety in the offspring. In a second step, through another linear regression, we examined whether gender is a moderator between age and the number of symptoms (*hypothesis 2*). An additional 15 binary logistic regression analyses were run to explore whether the interaction of age and gender was related to the individual symptoms. Due to the large number of individual symptoms which resulted in multiple tests, a Bonferroni correction was applied for the binary logistic regression analyses. Therefore, the alpha level of .05 was divided by 15, leading to a new alpha level of .003. As a result, the p-values below .05 were considered as borderline significant and indicated a trend.

### **Assumptions**

For the regression several assumptions had to be ensured. The assumptions of homoscedasticity and linearity were tested by evaluating the residual scatterplot of the dependent variable (i.e., number of symptoms). In addition, by ensuring that the Variance Inflation Factor (VIF) of the independent variables (i.e., age, sex) is under 1.6, the assumption of multicollinearity could be ensured (Moran, 2021). Lastly, normality was assessed with the Kolmogorov-Smirnov test as well as a histogram. Although the test was significant and the histogram indicated a slight deviation from a normal distribution, this is a common phenomenon among social science studies with large sample sizes and does not necessarily lead to a problem. Instead, it often reflects the nature of the variable measured (Massey, 1951). Regarding the logistic regression, the linear relationship between the independent variables and the logit of the dependent variable (each individual symptom) was assessed with the Hosmer and Lemeshow tests.

## **Results**

### **Descriptive Statistic**

From the sample of 514 offspring, 219 (42.6%) were male and 295 (57.4%) were female. The mean age was 18.1 ( $SD=.14$ ) years for all participants. The mean number of symptoms the offspring presented was 5.9 ( $SD=.18$ ) with prevalence rates ranging from 114 (22.2%) for experiencing an unpleasant feeling in their chest to 386 (75.1%) admitting to worrying a lot. More details on the distribution of depressive and/or anxiety symptoms among the offspring are showcased in Table 1.

**Table 1***Description of Offspring and the Number of Symptoms*

	Mean (SD) / N (%)
<b>Sociodemographic</b>	
Sex	
Female	295 (57.4%)
Male	219 (42.6%)
Age	18.1 (.18)
<b>Depression and anxiety symptoms</b>	
Number of symptoms	5.9 (.18)
Presence of individual symptoms	
Worrying a lot	386 (75.1%)
Worrying about everyday things	181 (35.2%)
Extremely nervous	181 (35.2%)
Dizziness	176 (34.2%)
Unpleasant feeling in chest	114 (22.2%)
Nausea	153 (29.8%)
Headaches	265 (51.6%)
Feeling sad	225 (43.8%)
Feeling hopeless	157 (30.5%)
Feeling worthless	181 (35.2%)
Feeling guilty	295 (57.4%)
Low energy/tired for no reason	249 (48.4%)
Not enjoying everyday things	141 (27.4%)
Lying awake for hours	206 (40.1%)
Sleeping restless	173 (33.7%)

**Age and the Presence of Symptoms**

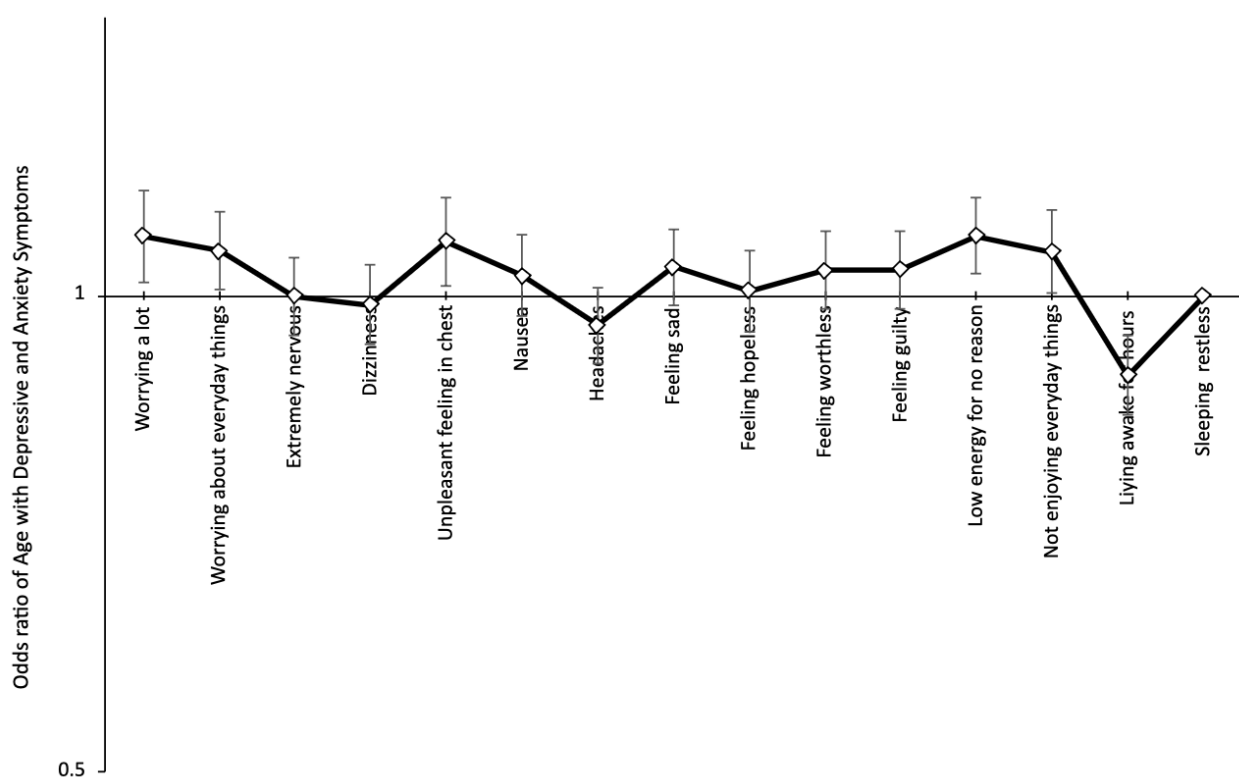
Firstly, a linear regression analysis was used to test whether age was positively related to the number of depressive/anxiety symptoms (*hypothesis 1*). In contrast to our expectation, no significant association was found between the two variables ( $B = 0.07, p = .214$ ).

For our exploratory analysis, binary logistic regression analyses were conducted to explore whether age was differentially related to individual symptoms of depression and/or anxiety. Overall, age was not related to 13 of the 15 of the individual symptoms, with odds ratios ranging from 0.89 to 1.09 (see Figure 1.). More specifically, “I have low energy for no

reason” (depression symptom) and “I often lie awake for hours before falling asleep” (sleep symptom) were significantly related to age (OR = 1.09,  $p = .002$  and OR = 0.89,  $p < .001$ , respectively). This means that one unit increase in age was related to a 1.09 higher likelihood of showing the symptom of low energy and a 0.89 lower likelihood of showing the symptom of difficulty falling asleep.

### Figure 1.

*The Associations of Offspring Age with Individual Symptoms of Depression and Anxiety*



### Moderation by Sex

To test whether the association between age and number of symptoms of depression and anxiety are stronger for girls than for boys (*hypothesis 2*), we conducted a linear regression analysis. Contrary to our expectation, the interaction of age and gender was not significant ( $p = .647$ ). In addition, after conducting 15 binary logistic analyses for each individual symptom, the interaction term of age and gender was not significant for any of the selected symptoms (all  $p > .11$ ) as can be seen in Table 2.

**Table 2**

*Results of logistic regression analysis for the Interaction Term of Age and Gender with Individual Symptoms*

Individual Symptom	<i>p</i>	B( <i>SE</i> )	OR
Worrying a lot	.424	-.05 (.07)	.95
Excessive worry about everyday things	.437	.05 (.06)	1.05
Extremely nervous	.933	-.00 (.06)	.99
Dizziness	.436	-.05 (.06)	.95
Unpleasant feeling in chest	.262	.08 (.07)	1.08
Nausea	.925	.00 (.00)	1.00
Headaches	.780	.01 (.05)	1.01
Feeling sad	.510	.04 (.06)	1.04
Feeling hopeless	.914	-.00 (.06)	.99
Feeling worthless	.145	.09 (.06)	1.10
Feeling guilty	.782	.01 (.05)	1.10
Low energy for no reason	.185	.07 (.05)	1.08
No enjoyment of everyday things	.333	.06 (.06)	1.06
Lying awake before sleep	.110	-.09 (.06)	.90
Sleeping restless	.962	-.00 (.06)	.99

### Discussion

Given that multiple previous studies have concluded that offspring of depressed and/or anxious parents have a higher chance of developing depression and anxiety disorders, the purpose of this study was to further investigate the role of offspring age in the intergenerational transference of depression and anxiety (Bijl et al., 2002; Kendler et al. 1997; Kessler et al. 1997; Merikangas et al. 1994). Contrary to our expectations, age was not associated with the overall number of depression and anxiety symptoms or with most of the individual symptoms. Exceptions were a positive association with “I often have low energy for no apparent reason” and a negative association with “I often lie awake for hours before

falling asleep”. Surprisingly, the results showed that gender did not moderate the association between age with and neither the number of symptoms nor the presence of any of the individual symptoms.

### **The Relation of Age with Depressive and Anxiety Symptoms**

Our findings suggest that older offspring do not display more depressive and anxiety symptoms. This contrasts with previous findings indicating that age predicts an increase in depression and anxiety disorders especially during adolescence (Hankin & Abramson, 2001; Schaakxs et al., 2016). However, it should be of note that the studies showcasing the forementioned increase are from the general population, unlike the current study which could explain the inconsistent findings of our study. In addition, it must be noted that the sample chosen in the current study was a high-risk sample which potentially decreases the likelihood of identifying a relationship between gender, age, and the symptoms of anxiety and depression. Namely, offspring of depressed and/or anxious parents are more likely to develop symptoms earlier on than non-offspring individuals regardless of their gender while also having more recurrences and worse long-term course of the disorders (Weissman, 1997; Weissman et al., 2016). The increased tendency towards developing depression and anxiety symptoms could skew the results towards not detecting a relationship due to the early accumulation of depressive and anxiety symptoms before the age of 13 (which is the youngest age in the sample). Moreover, the increased recurrence rate and worse outcome chances of the high-risk offspring could have caused symptoms to remain high regardless of age and gender. Consequentially, more detailed research ought to be conducted to account for the intricacies that characterize offspring of depressed and/or anxious parents.

Nevertheless, age was associated with two somatic/sleep symptoms. In line with previous studies, we found a positive association with “having low energy for no apparent reason”, which is in line with previous studies showcasing that somatic complaints increase



with age due to a multitude of factors such as a reduction in physical activity (Schaakxs et al., 2017; Schaakxs et al., 2016; Klaufus et al., 2022). In addition, a negative association was found between age and “lying awake for hours before falling asleep” which could be influenced by a lack of stress management skills during early years (Gardani et al., 2022). This means that due to difficulty managing their stress, younger individuals tend to use maladaptive strategies such as overthinking and worrying that often influence the ability to sleep.

The overall lack of relation between age and the number of depressive and anxious symptoms could be an indication of a more complex relationship of age to the forementioned symptoms as other research has indicated (Klaufus et al., 2022; Schaakxs et al., 2017). This is showcased well in recent studies where depressive symptoms tend to shift with age from mood-related to somatic (Klaufus et al., 2022; Schaakxs et al., 2017). A potentially explanatory factor in the development of depression and anxiety in later age appears to be energy since with increasing age, energy levels drop while energy-related symptoms have been shown to play an increasingly significant role in the development of depressions and anxiety (Klaufus et al., 2022). This could be on account of multiple factors such as hormones like cortisol and somatostatin as well as academic and parental pressures that have been linked to depressive/anxious states and potentially affect energy levels (Harris et al., 2015; Han, 2015; Yeom et al., 2020). Thus, it would be valuable for future studies to examine energy-related symptoms as well as the connection between the onset of energy loss with depression and anxiety to gain more clarity on the contribution of energy in the development of psychopathology.

### **The Role of Gender**

Contrary to our expectations, the number of symptoms that develops across age does not differ between girls and boys. In contrast to our findings, previous studies indicate that

gender influences the progression of depression and anxiety disorders, with girls showcasing double the rate of the forementioned disorders than boys (Altemus et al., 2014; Hankin & Abramson, 2001; Kessler et al., 1994). Moreover, an association of gender with depression/anxiety has been found, with girls scoring higher on severity of symptomatology especially when considering a wide age range (Kovacs, 2001). This difference in results could be due to a multitude of reasons. The most plausible explanation is the age range of our study (13-26 years old) which could potentially limit the chance of detecting the early differences being developed between genders. As previous literature indicates, gender differences in the clinical presentation of depression and anxiety are evident at a young age, especially among offspring of afflicted parents (Schuch et al., 2014; Weissman et al., 2016). Additionally, it could also be that offspring due to their increased risk from other factors such as stressful environment and learned behavior, develop symptoms of depression and anxiety regardless of their gender.

### **Clinical Implications**

The current study's findings have some relevant and important clinical implications regarding the transference of depression and anxiety disorders to the offspring of depressed and/or anxious parents. As indicated in our study, an association was found between age and two somatic/sleep symptoms, namely "I often have low energy for no apparent reason" and "I often lie awake for hours before falling asleep". The influence of age on the forementioned symptoms should be accounted for in clinical practice to assist the prevention of both depression and anxiety disorders among young offspring, especially given the central role of energy-related symptoms in the development of depression and anxiety (Klaufhus et al., 2022). More specifically, as a prevention strategy and general intervention, exercise could be integrated into children and adolescents' daily regimes since it can elevate energy levels when done in appropriate duration, frequency, and intensity (Wang et al., 2021). Moreover,

interventions such as yoga and meditation also have the potential to improve fatigue and sleep problems by promoting relaxation and reducing stress (Turmel et al., 2022).

Nevertheless, more research is necessary to substantiate the effectiveness of such lifestyle interventions on energy- and sleep-related symptoms of depression and anxiety.

Another important implication of our study, given the non-significant results, is not to specifically target age groups or a certain gender when considering prevention or treatment of depression and/or anxiety disorders among offspring of similarly affected parents. Since this high-risk group is yet to be thoroughly researched, and evidence so far indicates a heightened risk throughout their lifespan and regardless of their gender, measures should be taken to reduce the intensity and accumulation of symptoms (Weissman et al., 2016).

### **Strengths and Limitation**

The current study has several strengths. Most importantly, this study examined multiple depressive and anxiety symptoms in detail, enabling a nuanced exploration of the diverse manifestations of depression and anxiety. The study conducted an in-depth investigation to detect relationships between individual symptoms with age and gender. This approach provided valuable insight into how age and gender might influence the expression of specific symptomatology. Another noteworthy strength is the inclusion of a large pool of participants, comprising of both girls and boys. The substantial number of participants and representation of both genders improves the accuracy and generalizability of the study's results.

Nevertheless, our study also has several limitations that must be acknowledged. Firstly, the sample included participants from 13 up to 23 years old, which limits the ability to detect the relationship of individual symptoms with older age and restricts the results to a relatively small age range. This narrow age range not only does not allow for the detection of any change in symptomatology during childhood but also limits the chance of detecting the

full effect of age on depression and/or anxiety disorders. Another limitation is the focus on the absence rather than the severity of each symptom, which narrows the chance of detecting the accurate relationship between symptoms of depression and anxiety with age and gender. The current study was also cross-sectional rather than longitudinal, thus not examining the progress of symptomatology over time which limits the chance of examining the development of individual symptoms across age. Lastly, the focus of the current study was on somatic/sleep and general symptoms of depression and anxiety disorders. This narrows the scope of our exploration because depression and anxiety disorders are highly complex and comorbid, thus necessitating the inclusion of more symptoms to fully understand their development with age (Landman-Peeters, 2007). More specifically, including central symptoms of each disorder such as loss of interest, fear of the worst happening, and nervousness would potentially increase the chance of detecting at what age each gender develops the forementioned disorders (Park & Kim, 2020).

### **Suggestions for Future Research**

Based on the findings of this study and guided by its limitations, future research should place its focus on energy-related symptoms of anxiety and depression given that they appear to be affected by age and be connected to gender based on previous research (Klaufhus et al., 2022; Thompson et al., 2021). Energy loss also appears to be a central symptom in the network of depression and anxiety (Park & Kim, 2020). Moreover, future research should pay attention to childhood and preadolescence as a critical time for offspring of afflicted parents to better understand the mechanisms that enable the onset of depression and anxiety. Another interesting prospect for the future, is to explore differences between offspring of depressed and/or anxious parents and controls with non-afflicted parents to understand the differences among the two populations and to help prevent the transmission of the forementioned disorders. It would also be valuable to conduct prospective studies to

explore the progression of symptomatology with age to enhance the accuracy of detecting an accurate association. Lastly, future research would also benefit from prioritizing the severity of individual symptoms of depression and anxiety so as to gain a better understanding of the complex relationship between individual symptoms and age as well as gender.

### **Conclusion**

Our study centers on the topic of the transmission of depression and anxiety disorders from affected parents to their offspring. Due to the high likelihood that the offspring inherit their parents' emotion disorders, this specific topic is of particular importance and the mechanisms of transference ought to be explored (Havinga et al., 2016; Landman-Peeters, 2007; Mars et al., 2012; Weissman et al., 2006). However, age was not related to the symptomatology of the offspring and no gender differences were evident. The lack of significant results is potentially due to the limited age range of our sample. Nevertheless, it is likely that offspring of afflicted parents differ from community samples with regard to the effect of age and gender on the development of symptomatology. This is due to other genetic and environmental factors impacting the occurrence of depression and/or anxiety in them. Therefore, future research ought to explore the intricacies of this complex relationship, especially by taking into consideration the importance of individual symptoms in the transmission of emotion disorders.

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