Incidence, recurrence and comorbidity of anxiety disorders in four major developmental stages

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Abstract

Background: Anxiety disorders are common in childhood, adolescence, and adulthood, and frequently comorbid with other mental disorders.

Objective: The main aim of the present study was to examine the incidence, recurrence and comorbidity rates of anxiety disorders across four developmental periods, namely, during childhood (5 – 12.9 years), adolescence (13 – 17.9 years), emerging adulthood (18 – 23.9 years), and adulthood (24 – 30 years).

Method: Eight hundred and sixteen participants from a large community sample were interviewed twice during adolescence, at age 24, and at age 30. They completed self-report measures of psychosocial functioning and semi-structured diagnostic interviews during adolescence and adulthood.

Results: The result showed first incidence of anxiety disorders to be significantly higher in childhood and adulthood than in adolescence and emerging adulthood. Female gender was associated with first incidence, but not with recurrence. The magnitude of comorbidity was comparable across the four developmental stages, except for Substance use disorders (SUD) during adolescence. The presence of anxiety disorders during childhood and adolescence was found to significantly increase the probability of having an anxiety disorder during emerging adulthood.

Limitations: The participants are ethically and geographically homogenous.

Conclusion: Incidence and recurrence rates of anxiety disorders differed across the developmental periods, but no difference was found for the comorbidity rates.

Keywords: Developmental periods; anxiety disorders; emerging adults; adolescents

1. Introduction

There is persuasive evidence that anxiety disorders are the most frequent psychiatric disorders in childhood, adolescence, and adulthood. Up to 12% of children and up to 32% of adolescents and adults in the community are estimated to have been diagnosed with any anxiety disorders (Essau, 2005; Feehan et al., 1993; Lewinsohn et al., 1997; Merikangas et al., 2010; Wittchen et al., 1998). In addition to being highly prevalent, anxiety disorders tend to co-occur frequently both among themselves and with numerous other psychiatric disorders such as with depressive and substance use disorders (Essau et al., 2000; Feehan et al., 1993; Lewinsohn et al., 1997; Wittchen et al., 1998). Studies have also reported that more females than males meet the diagnosis of anxiety disorders, with gender differences occurring as early as childhood and reaching ratios of 2:1 to 3:1 in adolescence.

Most anxiety disorders tend to have an early onset, generally in childhood or early adolescence. If left untreated, anxiety disorders that begin early in life can become chronic (Essau et al., 2014; Feehan et al., 1993; Ferdinand and Verhulst, 1995; Keller et al., 1992; Letcher et al., 2012; Pine et al., 1998) and are associated with a high probability of recurrence (Bruce et al., 2005). The presence of anxiety disorders during adolescence also predicted a two to three-fold increased risk for anxiety disorders in adulthood (Pine et al., 1998). A recent study by Copeland et al. (2014) showed that 22.7% of their participants had met criteria for any anxiety disorders by early adulthood; this prevalence rate increased to 27.0% if overanxious disorder was included in the analyses. Their result also showed childhood anxiety disorders to be associated with adverse functioning in at least one life domain during young adulthood. Essau and colleagues (2014) recently examined the associations between anxiety disorders with an onset in two developmental periods (during childhood and adolescence) and psychosocial outcomes at

age 30. In that report, adolescent-onset anxiety disorder was associated with more negative course and outcome than childhood-onset anxiety disorder. Specifically, adolescent-onset anxiety disorder predicted poorer total adjustment, poorer adjustment at work, poorer family relationships, problems with the family unit, less life satisfaction, poorer coping skills, and more chronic stress in adulthood than those with childhood anxiety. Adolescent-onset anxiety disorder also predicted substance (SUD), alcohol abuse/dependence (AUD), and anxiety disorder in adulthood.

Although large longitudinal studies have enhanced our knowledge regarding the prevalence, comorbidity, and course and outcome of anxiety disorders in children, adolescents and adults, little is known about these characteristics of anxiety in emerging adults. Emerging adulthood is a developmental stage that spans between adolescence and adulthood (Arnett, 2000), which is characterized by significant psychological changes (e.g., autonomy, identity exploration) and distinct psychosocial events (e.g., residence [i.e., independent living], social role [e.g., getting married], and career pursuits [i.e., employment]).These changes are associated with stressors that are associated with both risk and opportunities for growth, which in turn could have a significant impact in mental health (Schulenberg et al., 2004).

On the basis of this general background, the present study reports the results of a 16-year longitudinal study and compares the incidence, recurrence and comorbidity rates of anxiety disorders in childhood, adolescence, emerging adulthood, and adulthood. The more specific aims are to address the following four questions. In each of these developmental stages: (a) what are the incidence and recurrence rates of anxiety disorders?; (b) what are the effects of gender on anxiety disorders?; (c) how frequently do anxiety disorders co-occur with depressive and

substance use disorders?; and (d) do anxiety disorders that are present in a prior developmental stage predict subsequent anxiety?

The hypotheses to be tested in this study were as follows: First, the highest incidence rate is hypothesized to be found during emerging adulthood; recurrence rate is expected to be the highest during adulthood (Scholten et al., 2016; Scholten et al., 2013). Second, females compared to males are expected to have significantly higher incidence and recurrence rates of anxiety disorders. Female gender is also expected to predict the recurrence of anxiety in any developmental stages (McLean et al., 2011). Third, in all developmental stages, there will be a strong association between anxiety and major depression, and between anxiety and substance use disorders (Essau et al., 2000; Lewinsohn et al., 1997; Wittchen et al., 1998). Fourth, the presence of an anxiety disorder at one developmental disorder will increase the risk of having an anxiety disorder in the subsequent developmental period (Essau et al., 2014; Pine et al., 1998).

To our knowledge, this is the first study that has compared the incidence, recurrence and comorbidity of anxiety disorders in childhood, adolescence, emerging adulthood, and adulthood with the same sample of individuals.

2. Methods

2.1. Participants

The present study used data from the Oregon Adolescent Depression Project (OADP; Lewinsohn et al., 1993), a longitudinal study of a large cohort of high school students who were randomly selected from nine high schools in western Oregon; detailed information about the OADP had been reported elsewhere (Lewinsohn et al., 2003; Pettit et al., 2006; Rohde et al., 2007). A total of 1709 adolescents (ages 14–18; mean age 16.6, SD=1.2) completed the initial

(T1) assessments who were invited to participate in the second assessment. About a year later, 1507 adolescents participated at time 2 (T2; 88%). For the third assessment (T3), all adolescents with a history of a depressive disorder by T2 (n=360) or a history of non-mood disorders (n=284), and a random sample of adolescents with no history of psychopathology by T2 (n=457) were invited to participate in a third (T3) evaluation. In addition, all non-white T2 participants were retained in the T3 sample to maximize ethnic diversity. A total of 1101 young adults participated at time 3 (T3), with a mean age of 24.2 years. At age 30, all T3 participants were asked to complete another interview assessment (mean age=30.45, SD=.70). Of the 941 who participated in the T3 assessment, 816 (87%) completed the T4 assessment.

Of these 816 individuals, 58.8% of the sample were female, with a mean age at T4 of 30.45 years (SD=0.70). Most participants were White (85.9%), others were African American (1%), Hispanic (3%), American Indian (3%), Asian (3%), and "other" (2%). About half of the sample was married (56.2%), and 41% had a bachelor's degree or higher by T4.

2.2. Measures

2.2.1. Diagnostic measures

Participants were interviewed with the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS; Orvaschel et al., 1982) at T1 and T2. For the follow-up assessments at T2 and T3, the participants were also administered with the Longitudinal Interval Follow-Up Evaluation (LIFE; Keller et al., 1987). The K-SADS/LIFE was used to collect information regarding the onset and course of disorders since the previous interview. The T4 interview consisted of a joint administration of the LIFE and the Structured Clinical Interview for DSM-IV (SCID; First et al., 1996) to collect information for new or

continuing episodes since T3. Diagnoses were based on DSM-III-R criteria for T1 and T2 and Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV; American Psychiatric Association, 1994) criteria for T3 and T4.

The anxiety disorder diagnostic category included generalized anxiety disorder, overanxious disorder, post-traumatic stress disorder, panic disorder, agoraphobia, social phobia, simple phobia, obsessive–compulsive disorder, and separation anxiety disorder. Substance use disorders (SUD) included alcohol abuse or dependence (AUD) and sedative/hypnotic/anxiolytic, cannabis, stimulant, opioid, cocaine, and hallucinogen/PCP abuse or dependence, and polydrug dependence. Disruptive disorder included attention deficit and hyperactivity disorder, oppositional defiant disorder and conduct disorder. The interrater reliability for depressive disorders (MDD or dysthymia) in the four time assessments, with Kappa ranging from 0.82 to 1.00; for anxiety disorders it ranged from 0.76 to 0.87; and for SUD from 0.81 to 0.96.

2.2.2. Statistical procedures

First incidence, recurrence, and total incidence were calculated using descriptive statistics and corresponding 95% confidence intervals. To investigate the extent to which gender (1=female, 0=male) predicted rates of anxiety, binary logistic regression models were used. Binary regression models were also used to examine the comorbidity between anxiety with depression and SUD. Because of the frequent comorbidity between SUD and disruptive behaviour disorders, comorbidity with SUD were both unadjusted and adjusted for the presence of disruptive behaviour disorders.

3. Result

3.1. Incidence and recurrence rates of anxiety disorders

Table 1 shows the first incidence (i.e., number of participants with first episodes of anxiety at each developmental stage), recurrent (i.e., number of participants with previous anxiety disorders in the previous developmental period and who have a new anxiety episode), and total incidence (i.e., number of cases in a developmental stage with either a first incidence or a recurrence). Following Rohde et al. (2012), the dominator for each of the developmental stage was calculated as follows: childhood (5.0 – 12.9 years) included all the participants (N=816), during the adolescence (13.0 – 17.9 years) there were 741 participants (816 minus 75), during emerging adulthood (18.0 – 23.9 years) there were 707 participants (816 minus 109), and during adulthood (24- 30 years), the number of participants were 671 (816 minus 145).

Significant differences in the incidence of anxiety disorders emerged across the four developmental stages. First incidence rates of anxiety disorders were significantly higher in childhood and adulthood than in adolescence and emerging adulthood. This higher incidence rate was related to separation anxiety in childhood, and to panic disorder in adulthood. Recurrence of anxiety disorders were found in adolescence, emerging adulthood, and adulthood, with comparable rates across these three developmental stages. The total incidence was significantly higher in adulthood than the other three developmental stages where comparable rates were found.

3.2. Gender and anxiety disorders

The next step of our analysis was to examine the extent to which gender predict the rates of anxiety disorders across the four developmental periods, using univariate logistic regression.

As shown on Table 2, female gender was associated with first and total incidence in childhood, emerging adulthood and adulthood, but not in adolescence.

The odds ratios for the recurrence of anxiety disorders were not significant in adolescence and emerging adulthood, suggesting that female gender did not predict recurrence during these two developmental stages.

3.3. Comorbidity of anxiety disorders

Table 3 shows the comorbidity between anxiety disorders with MDD and SUD. The comorbidity between anxiety disorders and SUD was examined first irrespective of the presence of disruptive behavioural disorder, and then by controlling for the presence of disruptive behavioural disorders. Significant comorbidity was found between anxiety disorders and MDD across developmental periods; the magnitude of comorbidity across periods was comparable, and indicated a four-fold increase in risk. The comorbidity between anxiety and SUD was significant across three of the four developmental periods (non-significant in the adolescent period), regardless of whether or not the presence of disruptive behavioural disorder was being controlled.

3.4. Impact of prior anxiety disorders

The degree to which the presence of anxiety disorders during an earlier developmental period influenced the risk of having an anxiety during a later developmental period was also examined. Following Rohde et al. (2013), we examined the extent to which the rate of anxiety disorders in adolescence was a function of MDD in childhood; emerging adulthood was a function of MDD in either childhood or adolescence; and adulthood was a function of MDD in

childhood, adolescence, or emerging adulthood. During adolescence, the probability of having an anxiety disorder given childhood anxiety was 8% (OR=2.26, 95% CI [0.91, 5.62]). During emerging adulthood, the probability of having an anxiety disorder given an anxiety during childhood or adolescence was 9% (OR=2.20, 95% CI [1.05-4.63]). During adulthood, the probability of having an anxiety disorder given an anxiety during childhood, adolescence, or emerging adulthood was 8% (OR=1.13, 95% CI [0.62-2.09]).

4. Discussion

The present study makes a significant contribution to our understanding of anxiety disorders by providing information on their incidence and recurrence rates and comorbidity patterns in childhood, adolescence, emerging adulthood, and adulthood in a large non-patient sample. This was made possible by following a large cohort of adolescents into adulthood. Four major findings were obtained.

First, the incidence rates of anxiety disorders were significantly higher in childhood and adulthood than the other two developmental stages. The higher incidence rate was related to the presence of separation anxiety in childhood, and to panic disorder in adulthood. The higher incidence of separation anxiety in childhood compared to other developmental stages supports previous studies that showed this disorder to have its first onset in childhood and is the earliest onset of all anxiety disorders (Beesdo et al., 2009); it also provides support to the finding that separation anxiety disorder is the most frequent anxiety disorder among children, with prevalence rates ranging from 2.8% to 8% (Beesdo et al., 2009; Bowen et al., 1990; Pine et al., 1998). Furthermore, the higher incidence of panic disorder in adulthood was in line with

previous studies that reported this disorder to have its first onset in adulthood (de Graaf et al., 2003; Kessler et al., 2005).

Our hypothesis that emerging adulthood would have the highest incidence of anxiety disorders was not supported. This was surprising given major life changes and stressors (e.g., relationship instability, lack of economic independence) that are often reported during this developmental stage which could put individuals at this stage at risk of developing an anxiety disorder (Schulenberg et al., 2004). However, it is worth noting that the concept of emerging adulthood is controversial, with some authors considering this concept to be better conceptualized in terms of economic conditions instead of a psychological developmental period (Côté and Bynner, 2008).

Second, the incidence of anxiety disorders is significantly higher in females than males during childhood, emerging adult, and adulthood. This finding replicates previous studies (Essau et al., 2000; Hale et al., 2008; Letcher et al., 2012; Merikangas et al., 2010; Pine et al., 1998; Reinherz et al., 1989) showing higher rate of anxiety disorders among females than males; previous studies have reported gender differences during childhood and then increase with age which reach ratios of 2:1 to 3:1 in adolescence (Pine et al., 1998) . Interestingly, no gender differences were found for first incidence of anxiety disorders during adolescence which is inconsistent with previous studies (Pine et al., 1998). While it is beyond the scope of the present study to explore the reason for this non-significant gender difference during this specific developmental stage, it could be related to the biological changes related to puberty which have similar impact on boys and girls.

Third, in agreement with previous studies (Essau et al., 2000; Kashani and Orvaschel, 1990; Last et al., 1997; Lewinsohn et al., 1997; Rohde et al., 1991), the degree of comorbidity

between anxiety disorders and MDD, as well as between anxiety and SUD were significant; to our knowledge the present study was the first to have examined the comorbidity between anxiety, MDD and SUD across the four developmental periods where comparable comorbidity rates were found, except for SUD during adolescence. Despite the high comorbidity rates between anxiety and other psychiatric disorders, the meaning of comorbidity for psychopathology issues remains unclear. One explanation could be related to our current classification and assessment of psychiatric disorders (Merikangas, 1990). Another explanation is related to the etiology of disorders. As argued by Merikangas (1990), the co-occurrence of disorders could be etiologic in that one disorder causes the second disorder, or that the two disorders are manifestations of the same underlying etiologic factors.

Fourth, the presence of anxiety disorders during childhood and adolescence was found to significantly increase the probability of having an anxiety during emerging adulthood. Indeed, several longitudinal studies have shown that young people with anxiety disorders compared with those without this disorder are at increased risk to have the same disorder (Bittner et al., 2007; Newman et al., 1996; Pine et al., 1998) at follow-up (‘‘homotypic continuity’’). Moreover, studies among adults have reported that those with anxiety disorders often had these same disorders during adolescence (Gregory et al., 2007).

5. Limitations

The study has some limitations which should be considered. First, the extent to which our findings are generalizable to other populations is unknown because the sample was restricted to one geographical location of the United States. Related to this limitation is the fact that the sample was predominantly of European-American descent. Second, given differences in

prevalence of anxiety disorders across ethnic groups, the generalizability of the present findings may be limited (Asnaani et al., 2010). Third, the OADP is a 16-year longitudinal study, and as such changes in the diagnostic criteria and assessment approaches used are inevitable; furthermore, there are some attrition at each assessment. Fourth, the information related to the diagnoses were assessed solely via self-report. Finally, similar to other longitudinal studies (e.g., Essau et al., 2002), the drop-out rate was high which was not surprising because the participants were followed over the period of 16 years.

6. Conclusions

The first incidence rates of anxiety disorders differ across the four developmental stages, and the presence of anxiety disorders during an earlier developmental period tended to increase the probability of having an anxiety during a later developmental period. Studies are needed to elucidate the social, psychological, and physiological processes that give rise to the differences in the incidence rates across developmental stages. A better understanding of these processes will likely play a crucial role in designing effective prevention programs for individuals in specific developmental stages.

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Table 1 Rates of specific types of anxiety disorders during the four developmental periods

	Child		Adolescent		Emerging adult		Adulthood	
	N (%)	[95% CI]	N (%)	[95% CI]	N (%)	[95% CI]	N (%)	[95% CI]
First incidence								
(total anxiety)	75 (7)	[5.2, 8.3]	34 (4)	[2.3, 4.8]	36 (4)	[2.7, 5.5]	46 (7)	[4.6, 8.4]
SepAnx	34 (0.03)	[0.02, 0.04]	2 (0.002)	[0.00, 0.004]	0 (00)	[0.0, 00]	0 (00)	[0.0, 0.0]
Phobia	23 (0.02)	[0.01, 0.03]	16 (0.02)	[0.01, 0.03]	10 (0.01)	[0.004, 0.02]	16 (0.02)	[0.01, 0.03]
Agoraphobia	1 (0.00)	[0.00, 0.00]	0 (00)	[0.0, 0.0]	4 (0.001)	[0.0, 0.01]	0 (00)	[0.0, 0.0]
Social phobia	14 (0.012)	[0.01, 0.02]	6 (0.01)	[0.001, 0.01]	5 (0.005)	[0.00, 0.01]	10 (0.01)	[0.004, 0.02]
Specific phobia	0 (00)	[0.0, 0.0]	7 (0.01)	[0.001, 0.01]	3 (0.003)	[0.0, 0.01]	11 (0.01)	[0.001, 0.02]
GAD	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 00]	1 (0.001)	[0.00, 0.00]	17 (0.02)	[0.01, 0.03]
OCD	3 (0.003)	[0.00, 0.01]	3 (0.003)	[0.00, 0.01]	0.00 (00)	[0.00, 0.00]	5 (0.004)	[0.001, 0.01]
Panic	4 (0.35)	[0.00, 0.70]	9 (0.88)	[0.30, 1.50]	17 (1.60)	[0.80, 2.40]	27 (3.10)	[1.90, 4.30]
Panic with Agora	2 (0.002)	[00, 0.004]	4 (0.004)	[0.0, 0.01]	3 (0.003)	[0.0, 0.01]	10 (0.01)	[0.004, 0.02]
Panic without Agora	2 (0.002)	[0.0, 0.004]	5 (0.004)	[0.001, 0.01]	14 (0.01)	[0.01, 0.02]	17 (0.02)	[0.01, 0.03]

PTSD	18 (0.02)	[0.01, 0.03]	11 (0.01)	[0.004, 0.02]	29 (0.03)	[0.02, 0.04]	12 (0.01)	[0.01, 0.02]
Acute stress	0 (00)	[00, 00]	0 (00)	[00, 00]	1 (0.001)	[00, 0.003]	0 (00)	[00, 00]
Recurrence								
(total anxiety)	0 (00)	[0.0, 0.0]	6 (8)	[1.7, 13.8]	10 (9)	[3.5, 13.9]	12 (8)	[3.4, 11.8]
SepAnx	0 (00)	[0.0, 0.0]	1 (0.03)	[0.00, 0.09]	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]
Phobia	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]
Agoraphobia	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]
Social phobia	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]
Specific phobia	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]
GAD	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]
OCD	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]
Panic	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	1 (7.12)	[0.00, 21.2]	1 (3.12)	[0.00, 9.20]
Panic with Agora	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	1 (0.14)	[0.0, 0.43]	0 (00)	[0.0, 0.0]
Panic without Agora	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	1 (0.05)	[0.00, 0.14]
PTSD	0 (00)	[0.0, 0.0]	1 (0.05)	[0.00, 0.15]	1 (0.03)	[0.00, 0.09]	1 (0.02)	[0.00, 0.05]
Acute stress	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]

Total incidence

(total anxiety)	75 (7)	[5.2, 8.3]	40 (4)	[2.6, 5.1]	46 (5)	[3.2, 6]	58 (7)	[4.9, 8.4]
SepAnx	34 (0.03)	[0.02, 0.04]	3 (0.003)	[0.00, 0.006]	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]
Phobia	23 (0.02)	[0.01, 0.03]	16 (0.02)	[0.01, 0.03]	10 (0.01)	[0.00, 0.02]	16 (0.02)	[0.01, 0.03]
Agoraphobia	1 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	4 (00)	[0.0, 0.01]	0 (00)	[0.0, 0.0]
Social phobia	14 (0.01)	[0.01, 0.02]	6 (0.01)	[0.001, 0.01]	5 (0.01)	[0.0, 0.01]	10 (0.01)	[0.004, 0.02]
Specific phobia	0 (00)	[0.0, 0.0]	7 (0.01)	[0.001, 0.01]	3 (0.003)	[0.0, 0.01]	11 (0.01)	[0.004, 0.02]
GAD	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	1 (0.001)	[0.00, 0.00]	17 (0.02)	[0.01, 0.03]
OCD	3 (0.003)	[0.00, 0.01]	3 (0.003)	[0.00, 0.01]	0 (00)	[0.0, 0.0]	5 (0.004)	[0.001, 0.01]
Panic	4 (0.35)	[0.00, 0.70]	9 (0.88)	[0.30, 1.50]	18 (1.67)	[0.90, 2.50]	28 (3.10)	[1.90, 4.30]
Panic with Agora	2 (0.002)	[0.0, 0.004]	4 (0.004)	[0.0, 0.01]	4 (0.00)	[0.0, 0.01]	10 (0.01)	[0.01, 0.02]
Panic without Agora	2 (0.002)	[0.0, 0.01]	5 (0.004)	[0.001, 0.01]	14 (0.01)	[0.01, 0.02]	18 (0.02)	[0.01, 0.03]
PTSD	18 (0.02)	[0.01, 0.03]	12 (0.01)	[0.01, 0.02]	30 (0.03)	[0.02, 0.04]	13 (0.01)	[0.01, 0.02]
Acute stress	0 (00)	[0.0, 0.0]	0 (00)	[0.0, 0.0]	1 (0.001)	[00, 0.003]	0 (00)	[0.0, 0.0]

Note: SepAnx = Separation Anxiety Disorder; GAD = Generalised Anxiety Disorder; OCD = Obsessive-Compulsive Disorder; Panic with Agora = Panic disorder with Agoraphobia; Panic without Agora = Panic disorder without Agoraphobia; PTSD = Post-traumatic Stress Disorder. OR = odds ratio; CI = confidence interval.

Table 2 Gender predicting anxiety disorders during the four developmental periods

Disorders	Child		Adolescent		Emerging adult		Adulthood	
	OR	[95% CI]	OR	[95% CI]	OR	[95% CI]	OR	[95% CI]
First incidence	2.95	[1.67, 5.10]***	2.07	[0.89, 4.85]	2.48	[1.10, 5.61]*	2.15	[1.08, 4.28]*
Recurrence	-		1.45	[0.16, 13.36]	1.32	[0.26, 6.70]	-	
Total incidence	2.95	[1.67, 5.18]***	2.12	[0.96, 4.69]	2.43	[1.17, 5.03]*	2.42	[1.26, 4.68]**

Note: OR = odds ratio; CI = confidence interval. For child, there is no recurrence, thus, the OR cannot be computed.

For adult, none of the male participants had any recurrence, thus the OR cannot be computed.

Table 3 Period comorbidity of anxiety disorders during the four developmental periods

Disorders	Child			Adolescent			Emerging adult			Adulthood		
	%	OR	[95% CI]	%	OR	[95% CI]	%	OR	[95% CI]	%	OR	[95% CI]
Major depression	16 v 4	4.59	[2.29, 9.20]	64 v 29	4.31	[2.61, 7.14]	57 v 28	3.53	[1.98, 6.30]	60 v 24	4.74	[2.77, 8.10]
Substance disorder[a]	5 v 1	4.40	[1.37, 14.15]	28 v 22	1.35	[0.80, 2.29]	42 v 28	1.90	[1.08, 3.38]	34 v 18	2.31	[1.33, 4.01]
Substance disorder[b]	4 v 1	4.59	[1.43, 14.66]	26 v 20	1.43	[0.83, 2.47]	44 v 47	1.87	[1.04, 3.34]	35 v 17	2.34	[1.34, 4.10]

Note: Childhood, 5.0–12.9 years of age; adolescence, 13.0–17.9 years of age; emerging adulthood, 18.0–23.9 years of age; adulthood, 24–30 years of age.

Percentages (%) represent anxiety disorders vs. no anxiety disorders. All tests significant at $p < .001$. OR = odds ratio; CI = confidence interval.

[a]Unadjusted associations. [b]Adjusted for the lifetime presence of disruptive behavior disorders.