HEP (2005) 169:405–432

Anxiety Disorders: Clinical Presentation and Epidemiology

R. Lieb

Clinical Psychology and Epidemiology, Max-Planck-Institute of Psychiatry,
Kraepelinstr. 2-10, 80804 München, Germany
lieb@mpipsykl.mpg.de

Abstract This chapter gives an overview of the clinical presentation of anxiety disorders and reviews basic epidemiological knowledge on them. The presented knowledge is largely related to the classification of anxiety disorders as presented by the Diagnostic and Statistical Manual of Mental Disorders since its third revision (DSM-III). Without going into detail into the history of the classification of anxiety disorders and into the history and development of the several editions of the Diagnostic Manual of Mental Disorders (DSM) of the American Psychiatric Association (APA) it should just briefly be mentioned that the DSM of the APA has undergone until today four revisions. Within these revisions, the third edition (DSM-III) changed most radically from the forerunning ones. The major change in DSM-III was that the category "anxiety neurosis" was deleted because this term was too general and could not be defined reliably. On the basis of evidence that imipramine can block panic attacks, panic

disorder was created as a new diagnosis for the first time in DSM-III. Anxiety states without spontaneous panic attacks were separated from panic disorder and defined as a residual category, generalized anxiety disorder. The revised version of DSM-III, DSM-III-R, was published in 1987, and the fourth and most recent edition, DSM-IV, was published in 1994. More recently, a text revision of DSM-IV has been published that does not entail changes to the diagnostic criteria of disorders, but provides updated empirical reviews for each diagnostic category regarding associated features, cultural, age, and gender features, prevalence, course, familial patterns, and differential diagnosis (DSM-IV-R). Without going into further details of the development and changes across the different editions and revisions of DSM—these have been reviewed comprehensively in other reviews—this chapter gives an overview about the clinical presentations of anxiety disorders by referring mainly to the forth edition of the DSM (DSM-IV 1994). In the second part, the chapter reviews and summarizes selected aspects (prevalence, correlates, risk factors and comorbidity) of epidemiological knowledge on anxiety disorders.

Keywords Phenomenology · Epidemiology · Prevalence · Age of onset · Comorbidity · Correlates

This chapter gives an overview of the clinical presentation of anxiety disorders and reviews basic epidemiological knowledge on them. The presented knowledge is largely related to the classification of anxiety disorders as presented by the Diagnostic and Statistical Manual of Mental Disorders since its third revision (DSM-III 1980). Without going into detail into the history of the classification of anxiety disorders and into the history and development of the several editions of the Diagnostic Manual of Mental Disorders (DSM) of the American Psychiatric Association (APA) it should just briefly be mentioned that the DSM of the APA has undergone until today four revisions. Within these revisions, the third edition (DSM-III 1980) changed most radically from the forerunning ones. The major change in DSM-III was that the category "anxiety neurosis" was deleted because this term was too general and could not be defined reliably. On the basis of evidence that imipramine can block panic attacks (Klein 1964), panic disorder was created as a new diagnosis for the first time in DSM-III. Anxiety states without spontaneous panic attacks were separated from panic disorder and defined as a residual category, generalized anxiety disorder. The revised version of DSM-III, DSM-III-R, was published in 1987, and the fourth and most recent edition, DSM-IV, was published in 1994. More recently, a text revision of DSM-IV has been published that does not entail changes to the diagnostic criteria of disorders, but provides updated empirical reviews for each diagnostic category regarding associated features, cultural, age, and gender features, prevalence, course, familial patterns, and differential diagnosis (DSM-IV-R 2000). Without discussing further details of the development and changes across the different editions and revisions of DSM—these have been reviewed comprehensively in other reviews (see Brown and Barlow 2002; Marshall and Klein 2003)—this chapter gives in the first part an overview about the clinical presentations of anxiety disorders by referring

mainly to the forth edition of the DSM (DSM-IV 1994). In the second part, the chapter reviews and summarizes selected aspects (prevalence, correlates, risk factors and comorbidity) of epidemiological knowledge on anxiety disorders.

1
Part I: Clinical Presentation

Overall, the core element of all anxiety disorders is the occurrence of an anxiety reaction that may vary widely in terms of intensity, frequency, persistence, trigger situations, severity and consequences and other qualifying features. Anxiety disorders as defined in the current DSM-IV can be described in terms of the situations, objects or thoughts which provoke anxiety, the specific expression of anxiety in terms of autonomic, and cognitive or motoric features, as well as the specific behaviours used to cope with the provoked anxiety. In some disorders anxiety is expressed mainly in physiological reactions such as heart palpitations (panic disorder), in others primarily by avoidance (specific phobias), and still others by cognitive symptoms such as obsessions or worries (obsessive-compulsive disorder, generalized anxiety disorder). Table 1 gives an overview of the key features of major anxiety disorders included in DSM-IV.

DSM-IV specifies a total of 12 anxiety disorders, but starts by defining panic attacks. Panic attacks are defined separately but are not considered as a separate diagnostic category because they may occur in many of the other anxiety disorders. Likewise, agoraphobia and panic disorder are not considered as specific anxiety diagnoses but rather their combination. In the following, a description of the clinical presentation will be given:

1.1
Panic Attack

Panic attacks are brief, recurrent, unexpected and discrete periods of feelings of intense fear or discomfort. For a diagnosis according to DSM-IV, at least four of the following typical panic symptoms must be present: pounding heart or accelerated heart rate, sweating, trembling or shaking, sensations of shortness of breath or smothering, feeling of choking, chest pain or discomfort, nausea or abdominal stress, feeling dizzy, light-headed or faint, unsteady, derealization (feelings of unreality) or depersonalization, fear of losing control or going crazy, fear of dying, paresthesias, and chills or hot flushes. Spontaneous panic attacks occur "out of the blue" without any obvious environmental or situational triggers. The DSM-IV also identifies (1) situationally bound (cued) panic attacks, in which the panic attack almost invariably occurs immediately on exposure to the situational trigger, and (2) situationally predisposed panic attacks, which are more likely to occur on exposure to the situational cue but

Table 1 Overview of key features major anxiety disorders according to DSM-IV

Code	Diagnosis	Key feature(s)
	Agoraphobia	Anxiety about being in places/situations in which escape might be difficult/embarrassing, or help may not be available in the event of having panic attacks
	Panic disorder	Presence of recurrent, unexpected panic attacks
		Persistent concern about having other attacks
		Worry about possible implications/consequences of the attacks
300.01	Panic disorder without agoraphobia	Criteria for panic disorder are met
		Criteria for agoraphobia are not met
300.21	Panic disorder with agoraphobia	Criteria for panic disorder are met
		Criteria for agoraphobia are met
300.22	Agoraphobia without history of panic disorder	Criteria for agoraphobia are met
		Focus of fear is on the occurrence of embarrassing panic-like symptoms rather than full panic attacks
300.29	Specific phobia	Marked and persistent fear of clearly circumscribed objects or situations
		Exposure to phobic stimulus provokes immediate anxiety response
300.23	Social phobia	Marked and persistent fear of social or performance situations in which embarrassment may occur
		Exposure to situation provokes immediate anxiety response
300.3	Obsessive-compulsive disorder	Recurrent obsessions or compulsions that are severe enough to be time consuming
		Cause-marked distress or impairment
		Person recognizes that obsessions or compulsions are excessive or unreasonable
308.3	Acute stress disorder	Symptoms similar to those of posttraumatic stress disorder that occur immediately in the aftermath of an extremely traumatic event
309.81	Posttraumatic stress disorder	Development of characteristic symptoms following an extreme traumatic event
300.02	Generalized anxiety disorder	Chronic excessive anxiety and worry about a number of events or activities
293.89	Anxiety disorder due to a general medical condition	Symptoms of anxiety that are judged to be a direct physiological consequence of a general medical conditions
	Substance-induced anxiety disorder	Prominent symptoms of anxiety that are judged to be a direct physiological consequence of a drug of abuse, a medication or toxin exposure
300.00	Anxiety disorder not otherwise specified	Anxiety or phobic avoidance that do not meet criteria for any of the specific anxiety disorders

are not invariably associated with this cue and do not necessarily occur immediately after exposure. Panic attacks can occur in a wide range of mental disorders, including other anxiety disorders and mood disorders.

1.2 Panic Disorder and Agoraphobia

In the DSM-IV description of panic disorder, recurrent and at least initially unexpected panic attacks are the key clinical feature, along with persistent concerns about having another attack, worry about the implications or the consequences of the attack, or a remarkable behavioural change related to the attacks. Here again, the panic attacks do not reflect exposure to a situation that always causes anxiety (as in specific phobia) and are not triggered, for example, by social attention. Panic disorder should be classified as either with or without agoraphobia. Agoraphobia is defined as fear of situations from which escape may be difficult or embarrassing or in which help may not be available when panic attacks occur. The person avoids these situations, endures them with anxiety about having another panic attack, or can tolerate them only if another person is present.

According to the DSM-IV criteria, agoraphobia without panic disorder can be described as being in places where help might be difficult or embarrassing, or in which help may not be available in the event of panic-like symptoms, rather than the presence of full panic attacks. Typical situations involve being outside the home, being in a crowd or a line, being on a bridge, or in a bus, subway or car (DSM-IV 1994). For a diagnosis of panic disorder with or without agoraphobia, differential diagnosis must assure that neither the panic attacks nor the avoidance behaviour is part of a physiological condition, medical condition, or other mental disorder.

1.3 Specific Phobia

The key feature of specific phobia is an intense and persistent fear of circumscribed situations or specific stimuli (e.g. exposure to animals, blood). Confrontation with the situation or stimulus provokes almost invariably an immediate anxiety response. Often, the situation or stimulus is therefore avoided or endured with considerable dread. Adolescents and adults with this disorder recognize that this anxiety reaction is excessive or unreasonable, but this may not be the case in children. For a diagnosis according to DSM-IV, the avoidance, fear or anxious anticipation of the phobic stimulus must interfere with the persons daily life or the person must be markedly distressed about having the phobia. Further, the phobic reactions are not better explained by another mental disorder, such as, for example, social phobia.

1.4 Social Phobia

Social phobia can be characterized as overwhelming anxiety and excessive self-consciousness in social situations. The fundamental clinical feature of social phobia is a marked and persistent fear of social or performance situations in the presence of unfamiliar people or when scrutiny by others is possible, even in the context of small groups. Examples would be concern about being unable to speak in public or choking on food when eating in a restaurant. Exposure to such social and performance situations provokes an immediate anxiety response or results in maladaptive avoidance behaviour. Associated features of social phobia frequently include poor social skills, hypersensitivity to criticism and negative evaluation and difficulty of being assertive, as well as low self-esteem and feelings of inferiority. This fear of social situations can be associated with physical symptoms such as blushing, sweating, trembling or heart palpitations. Many people with social phobia recognize that their fear of being among people may be excessive or unreasonable, but they are unable to overcome it. They often worry for days or weeks in advance of a dreaded situation. It is important, however, to note that simple performance anxiety, stage fright or shyness in social situations should not be diagnosed in DSM-IV as social phobia unless the anxiety or avoidance are so marked and persistent that they lead to clinically significant impairment or subjective suffering. For a diagnosis, DSM-IV further demands that the fear is not due to the effect of a substance or a medical condition, and is not better accounted for by another mental disorder.

1.5 Obsessive–Compulsive Disorders

Obsessive–compulsive disorder (OCD) is characterized by recurring and extremely time-consuming obsessions or compulsions that cause marked distress or significant impairment in daily functioning. Obsessions can be described as recurrent, intrusive or inappropriate thoughts, images or impulses that cause feelings of anxiety. Obsessions often involve preoccupations with contamination, symmetry, pathological doubting or uncertainty or harm to self or others, as well as preoccupations with sexual or violent thoughts. The persons often have the feeling that omitting the ritual will lead to disastrous results. Compulsions can be characterized as repetitive behaviours that the person feels driven to perform in an attempt to avoid feelings of tension or anxiety. They can include both repetitive physical behaviours (such as stereotypic counting or arranging, checking or cleaning behaviours) and also mental rituals (such as repeating specific verbal rituals). Obsessions are unpleasant and provoke anxiety, whereas carrying out a compulsion may reduce anxiety. Although compulsions are defined by DSM-IV as repetitive behaviours that

a person feels driven to perform in response to an obsession, the diagnostic criteria allow the diagnosis of OCD also to be made when a person reports only compulsions. In order to meet DSM-IV criteria for OCD, obsessions and the performance of the compulsions must be of significant intensity and/or frequency to cause significant distress or marked impairment. The person has further to recognize, at least in part, the irrational nature of the obsessive–compulsive symptoms, yet he or she is not able to stop them. The differential diagnosis of OCD includes other mental disorders in the context of which repetitive behaviours and thoughts can occur. For a diagnosis of OCD, the content of the obsessions/compulsions cannot be completely explained by another disorder. The obsessions of OCD must further be distinguished from the ruminations of major depression, racing thoughts of mania, and psychotic features of schizophrenia. The compulsions of OCD must be distinguished from the stereotypic movements found in individuals with mental retardation or autism, the tics of Tourette syndrome, the stereotypies of complex partial seizures and the ritualized self-injurious behaviours of borderline personality disorder.

1.6 Posttraumatic Stress Disorder

Posttraumatic stress disorder (PTSD) is an anxiety disorder that can develop after exposure to a terrifying event in which severe physical harm occurred or in which the person was threatened. According to DSM-IV the diagnosis of PTSD is based on an extreme response to an extremely threatening and stressful event (e.g. natural disasters, wars, actual or threatened injuries, violent personal assaults). As a reaction to the traumatic event, the person develops an intense feeling of fear, horror and helplessness. The person may suffer from repeated involuntary re-experiences of some aspects of the situation in the form of flashback episodes or dreams. These re-traumatizations may occur spontaneously or subtle cues linked to the event may trigger them. In addition, the person shows physical or emotional avoidance of disturbing memories and a numbing of general responsiveness. This may imply feelings of detachment or estrangement from others, a restricted range of affect and a sense of a foreshortened future. Finally, there are symptoms of increased arousal including sleep disturbance, difficulties with memory and concentration, hypervigilance, irritability or angry outbursts as well as an exaggerated startle response. DSM-IV allows for the specification of symptoms of PTSD to be acute (less than 3 months duration of symptoms), chronic (more than 3 months duration of symptoms) or delayed (onset of the symptoms at least 6 month after the trauma). For a diagnosis, symptoms of re-experience, avoidance and increased arousal must be present for more than 1 month and must be associated with remarkable distress or impairment in everyday life.

1.7 Generalized Anxiety Disorder

The essential clinical feature of generalized anxiety disorder (GAD) is long-lasting, excessive and unrealistic anxiety or worry about a number of life circumstances occurring. The worry and tension is causeless and more severe than the degree of anxiety most people experience. The anxiety further is associated with increased cognitive and physiological arousal. Usually, people with GAD expect the worst: they worry excessively about money, health, family or work, even when there are no signs of trouble at all. For a diagnosis to be made according to DSM-IV, the person must experience the worries over a period of 6 months or more, must find it difficult to control the worries and the symptoms must cause marked distress or significant impairment in daily life. At least three of the following six symptoms also need to be persistent: restlessness, being easily fatigued, difficulty in concentrating, irritability, muscle tension and sleep disturbance. This diagnosis needs to be distinguished from anxiety arising as part of a mood disorder, or anxiety related to another DSM-IV axis I disorder.

2 Part II: Epidemiology

2.1 Prevalence

In the last few decades several large epidemiological studies have estimated the prevalence of anxiety disorders in the community; most of them were carried out in industrialized countries.

Table 2 summarizes lifetime, 12-month, 6-month and point prevalence findings for anxiety disorders across major community studies that have been conducted since the introduction of the DSM-III in 1980. Table 2 in addition provides information about diagnostic criteria, instruments used, and sample sizes.

Before trying to come to a conclusion about the prevalence of anxiety disorders in the general population, some comments should be made about the reasons why one must be careful when interpreting the results. As we see in Table 2, we are facing different studies conducted in different countries in various settings. Across the cited studies, different diagnostic instruments, different sampling procedures, inclusion of different age groups, different criteria used to generate diagnoses, different time frames for the diagnoses (e.g. lifetime, six-month prevalence or point estimates) and different severity ratings for diagnostic decisions have been used. All these methodological differences may at least partially explain the, at the first sight, remarkable degree of heterogeneity and inconsistency of findings across the reviewed studies.

Table 2 Prevalence rates of anxiety disorders in the general population according to DSM-III, DSM-III-R and DSM-IV

Study (country); reference	Assessment instrument[2]	*n* Age	Time frame	Anxiety disorder (any)	Subtypes						
					Panic disorder[1]	Agora-phobia[2]	Specific phobia	Social phobia	GAD	OCD	PTSD
DSM-III											
ECA (five districts in the USA)	DIS	*n*=20,291	Lifetime	14.6[3]	1.6 (0.5)	5.2	10.0	2.8	4.1–6.6[4]	2.5	-
Regier et al. 1990		Age: >18	12-month	-	-	-	-	-	2.0–3.6[4]	1.7	-
			6-month	8.9[3]	0.8 (0.2)	3.4	6.4	1.5	-	1.5	-
			Point (1-month)	7.3[3]	0.5 (0.2)	2.9	5.1	1.3	-	1.3	-
Christchurch (New Zealand)	DIS	*n*=1,498	Lifetime	10.5[5]	2.2	8.1[6]	-	3.0	31.1	2.2	-
Wells et al. 1989		Age: 18–64	12-month	-	-	-	-	-	-	-	-
			6-month	-	-	-	-	-	-	-	-
			Point	-	-	-	-	-	-	-	-
Seoul (Korea)	DIS	*n*=3,134	Lifetime	9.2[7]	1.1	2.1 (0.7)	5.4	0.5	3.6	2.3	-
Lee et al. 1990		Age: 18–65	12-month	-	-	-	-	-	-	-	-
			6-month	-	-	-	-	-	-	-	-
			Point	-	-	-	-	-	-	-	-
MFS, Munich (Germany)	DIS	*n*=483	Lifetime	13.9[3]	2.4	5.7	8.0[8]/5.2[9]	2.2[9]	-	2.0	-
Wittchen et al. 1992		Age: 18–55	12-month	-	-	-	-	-	-	-	-
Wittchen and Perkonigg 1996			6-month	8.1[3]	1.1	3.6	4.1[8]		-	1.8	-
			Point (1-month)	7.2[3]	1.0	2.9	3.7[8]	-	-	1.4	-
Zurich (Switzerland)[10]	SPIKE	*n*=546	Lifetime	15.5[11]	2.7	4.5	11.8	5.3	2.9	1.0	-
Angst and Dobler-Mikula 1985		Age: 19–20	12-month	-	0.2	1.6 (0.7)	1.2	-	-	-	-
Angst 1993			3-month	-	0.1	1.5 (0.7)	1.2	-	-	-	-
			Point (n.r.)	-	0.1	1.5 (0.7)	1.2	-	-	-	-
Florence (Italy)	FPI	*n*=1,110	Lifetime	-	1.4	0.4 (0.9)	0.6	1.0	5.4	0.7	0.2
Faravelli et al. 1989		Age >14	12-month	-	-	-	-	-	-	-	-
			6-month	-	-	-	-	-	-	-	-
			Point (n.r.)	-	0.3	0.3 (0.7)	0.5	0.5	2.8	0.6	0.1
Puerto Rico	DIS	*n*=1,551	Lifetime	13.6[3]	1.7	6.9	8.6	1.6	-	3.2	-
Canino et al. 1987		Age: 17–64	12-month	-	-	-	-	-	-	-	-
			6-month	7.5[3]	1.1	3.9	4.4	1.1	-	1.8	-
			Point	-	-	-	-	-	-	-	-

Table 2 (continued)

Study (country); reference	Assessment instrument[2]	*n* Age	Time frame	Anxiety disorder (any)	Subtypes						
					Panic disorder[1]	Agoraphobia[2]	Specific phobia	Social phobia	GAD	OCD	PTSD
Edmonton (Canada)	DIS	*n*=3,258	Lifetime	11.2[3]	1.2	2.9	7.2	1.7	-	3.0	-
Bland et al. 1988		Age >18	12-month	-	-	-	-	-	-	-	-
			6-month	-	-	-	-	-	-	-	-
			Point	-	-	-	-	-	-	-	-
DSM-III-R											
NCS (USA)	CIDI	*n*=8,098	Lifetime	24.9[11]	3.5	5.3	11.3	13.3	5.1	-	7.8[12]
Kessler et al. 1994		Age: 15–54	12-month	17.2[11]	2.3	2.8	8.8	7.9	3.1	-	-
			6-month	-	-	-	-	-	-	-	-
			Point	-	-	-	-	-	-	-	-
NEMESIS (Netherlands)	CIDI	*n*=7,076	Lifetime	19.3[7]	3.8	3.4	10.1	7.8	2.3	0.9	-
Bijl et al. 1998		Age: 18–64	12-month	12.4[7]	2.2	1.6	7.1	4.8	1.2	0.5	-
			6-month	-	-	-	-	-	-	-	-
			Point (1-month)	9.7[7]	1.5	1.0	5.5	3.7	0.8	0.3	-
ECA-SP (Brazil)	CIDI	*n*=1,464	Lifetime	17.4[13]	-	-	-	-	-	-	-
Andrade et al. 1996[14]		Age>18	12-month	10.9[13]	-	-	-	-	-	-	-
			Point (1-month)	8.7[13]	-	-	-	-	-	-	-
MHS-OHS (Canada)	UM-CIDI	*n*=6,261	Lifetime	21.3[13]	-	-	-	-	-	-	-
Offord et al. 1994[14]		Age: 18–54	12-month	12.4[13]	1.1	1.6	6.4	6.7	1.1	-	-
Offord et al. 1996			6-month	-	-	-	-	-	-	-	
			Point (1-month)	6.2[13]	-	-	-	-	-	-	
EPM (Mexico)	UM-CIDI	*n*=1,734	Lifetime	5.6[13]	-	-	-	-	-	-	-
Caraveo et al. 1998[14]		Age: 18–54	12-month	4.0[13]	-	-	-	-	-	-	-
			Point (1-month)	2.3[13]	-	-	-	-	-	-	-
Mental Health Program Turkey	CIDI	*n*=6,095	Lifetime	7.4[13]	-	-	-	-	-	-	-
Kýlýc 1998[14]		Age: 18–54	12-month	5.8[13]	-	-	-	-	-	-	-
			Point (1-month)	5.0[13]	-	-	-	-	-	-	-
MAPSS (USA)	CIDI	*n*=3,012	Lifetime	16.8[15]	1.7	7.8	7.4	7.4	-	-	-
Vega et al. 1998		Age: 18–59	12-month	-	-	-	-	-	-	-	-
			6-month	-	-	-	-	-	-	-	-
			Point	-	-	-	-	-	-	-	-

Table 2 (continued)

Study (country); reference	Assessment instrument[2]	*n* Age	Time frame	Anxiety disorder (any)	Subtypes						
					Panic disorder[1]	Agora-phobia[2]	Specific phobia	Social phobia	GAD	OCD	PTSD
Oslo (Norway)	CIDI	*n*=2,066	Lifetime	-	4.5	6.1	14.4	13.7	4.5	1.6	-
Kringlen et al. 2001		Age: 18–65	12-month	-	2.6	3.1	11.1	7.9	1.9	0.7	-
			6-month	-	-	-	-	-	-	-	-
			Point	-	-	-	-	-	-	-	-
Basel (Switzerland)	CIDI	*n*=470	Lifetime	28.7[11]	1.3 (2.1)	10.8	4.5	16.0	1.9	-	-
Wacker et al. 1992		Age: 18–65	12-month	-	-	-	-	-	-	-	-
			6-month	-	-	-	-	-	-	-	-
			Point	-	-	-	-	-	-	-	-
DSM-IV											
EDSP, Munch	M-CIDI	*n*=3,021	Lifetime	14.4[16]	1.6	2.6	2.3	3.5	0.8	0.7	1.3
Wittchen et al. 1998a		Age: 14–24	12-month	9.3[16]	1.2	1.6	1.8	2.6	0.5	0.6	0.7
			6-month	-	-	-	-	-	-	-	-
			Point	-	-	-	-	-	-	-	-
GHS-MHS (Germany)	CIDI	*n*=4,181	Lifetime	-	3.9	-	-	-	-	-	-
Wittchen and Jacobi 2001		Age: 18–65	12-month	14.5[17]	2.3	2.0	7.6	2.0	1.5	0.7	-
Jacobi et al. 2004			6-month	-	-	-	-	-	-	-	-
			Point (4 weeks)	9.0	1.1	-	-	-	1.2	0.4	-
Dresden-Study	F-DIPS	*n*=1,538	Lifetime	27.2[18]	2.1 (0.8)	2.3	12.3	12.0	2.4	1.3	3.0
Becker et al. 2000		Age: 18–25 (w)	12-month	-	-	-	-	-	-	-	-
			6-month	-	-	-	-	-	-	-	-
			Point (7 days)	17.9[18]	0.3 (0.5)	1.8	9.8	6.7	1.4	0.8	0.4
TACOS	M-CIDI	*n*=4,075	Lifetime	15.1[19]	0.9 (1.3)	1.1	10.6	1.9	0.8	0.5	1.4
Meyer et al. 2000		Age: 18–64	12-month	-	-	-	-	-	-	-	-
			6-month	-	-	-	-	-	-	-	-
			Point	-	-	-	-	-	-	-	-

Table 2 (continued)

Study (country); reference	Assessment instrument[2]	*n* Age	Time frame	Anxiety disorder (any)	Subtypes						
					Panic disorder[1]	Agora-phobia[2]	Specific phobia	Social phobia	GAD	OCD	PTSD
NSMHW (Australia)	CIDI	*n*=10,641	Lifetime	-							
Andrews et al. 2001		Age: 18+	12-month	5.6[20]	1.1	0.5	-	1.3	2.6	0.7	1.3
			6-month	-	-	-	-	-	-	-	-
			Point (1-month)	3.8[20]	0.5	0.2	-	1.0	2.0	0.5	0.9
South Florida-Study (USA)	CIDI	*n*=1,803	Lifetime	15.2[21]	2.1	-	-	2.5	1.4	-	11.7
Turner and Gil 2002		Age: 19–21	12-month	-	1.6	-	-	-	-	-	8.4
			6-month	-	-	-	-	-	-	-	-
			Point	-	-	-	-	-	-	-	-
ESEMED	CIDI	*n*=21,425	Lifetime	13.6[22]	2.1	0.9	7.7	2.4	2.8	-	1.9
Alonso et al. 2004		Age: 18–65+	12-month	6.4	0.8	0.4	3.5	1.2	1.0	-	0.9
			6-month	-	-	-	-	-	-	-	-
			Point	-	-	-	-	-	-	-	-

CIDI, Composite International Diagnostic Interview; DIS, Diagnostic Interview Schedule; ECA, Epidemiologic Catchment Area program (if not annotated differently, all data refer to all five districts); ECA-SP, Epidemiologic Catchment Area study in the city of Sao Paolo; EDSP, Early Developmental Stages of Psychopathology study, in reference to the base analysis of ages 14 to 24; EPM, Epidemiology of Psychiatric Comorbidity Project; ESEMED, European Study of the Epidemiology of Mental Disorders; F-DIPS, Diagnostisches Interview bei psychischen Störungen—Forschungsversion.; FPI, Florence Psychiatric Interview; GAD, generalized anxiety disorder; GHS-MHS, General Health Survey—Mental Health Supplement; MAPSS, The Mexican American Prevalence and Services Survey; M-CIDI, Munich-Composite International Diagnostic Interview; MFS, Munich Follow-up Study; MHS-OHS, The Mental Health Supplement to the Ontario Health Survey; n.r., not reported; NCS, National Comorbidity Survey; NEMESIS, Netherlands Mental Health Survey and Incidence Study; NSMHW, National Survey of Mental Health and Wellbeing; OCD, obsessive–compulsive disorder; PTSD, post-traumatic stress disorder; SPIKE, Structured psychopathology interview and rating of the social consequences of psychic disturbances for epidemiology; TACOS, Transitions in Alcohol Consumptions and Smoking; UM-CIDI, University of Michigan modified version of the Composite International Diagnostic Interview. [1]DSM-III: panic disorder without agoraphobia (with agoraphobia); DSM-III-R/DSM-IV: with/without agoraphobia. [2]DSM-III: agoraphobia with/without panic attacks (with panic attack); DSM-III-R/DSM-IV: Agoraphobia without panic attack. [3]Phobias (agora-, social, specific), panic disorder, obsessive–compulsive disorder. [4]Quoted from Carter et al. 2001; data refer to the districts Durham, St. Louis und Los Angeles. [5]Phobias (agora-, specific), panic disorder, obsessive–compulsive disorder, somatoform disorder. [6]Agoraphobia or specific phobia. [7]Phobias (agora-, social, specific), panic disorder, obsessive–compulsive disorder, GAD. [8]Including social phobia. [9]Wittchen 1993. [10]Lifetime: cumulative lifetime prevalence with 30 years; other data refer to ages 22–23. [11]Phobias (agora-, social, specific), panic disorder, GAS. [12]Quoted from Kessler et al. 1995. [13]Phobias (agora-, social, specific), panic disorder and/or GAS. [14]Quoted and cited from ICPE (Andrade et al. 2000). [15]Phobias (agora-, social, specific), panic disorder. [16]Phobias (agora-, social, specific, NBB), panic disorder, GAD, obsessive–compulsive disorder, PTSD. [17]Phobias (agora-, social, specific, NOS), panic disorder, GAD, obsessive–compulsive disorder. [18]Phobias (agora-, social, specific, NOS), panic disorder, GAS, obsessive–compulsive disorder, PTSD, acute stress disorder. [19]Phobias (agora-, social, specific, NOS), panic disorder, GAD, obsessive–compulsive disorder, PTSD, anxiety disorder based on a medical condition. [20]Phobias (agora-, specific), panic disorder, obsessive–compulsive disorder, PTSD. [21]Social phobia, panic disorder, GAD, PTSD. [22]GAD, social phobia, specific phobia, agoraphobia, PTSD.

Looking now into the prevalence rates reported from the several studies, lifetime prevalence rates for all anxiety disorders lumped together in the different studies range between 5.6% and 28.7%. The estimated median of the included studies is 15.1%. Lifetime prevalence estimates describe the proportion of persons in the population who have developed the disorder under consideration at least once in their life. Based on this estimated median, anxiety disorders occur in approximately 1 in 7 persons in the general population at some point in their life. Looking closer at specific anxiety disorders, it becomes evident that the high lifetime prevalence of anxiety disorders is mostly due to the high frequency of simple phobia and social phobia.

Across studies, lifetime prevalence estimates for specific phobia range from 0.6% to 14.4%. Table 3 presents, additionally, lifetime prevalence rates for specific fears and phobias, based on the findings from the U.S. National Comorbidity Survey (NCS; Kessler et al. 1994; Curtis et al. 1998). As can be seen, the most prevalent specific phobias were animal phobia (5.7%) and height phobia (5.3%), confirming previous research findings from the Epidemiological Catchment Area Survey (Bourdon et al. 1988). Across the studies, lifetime prevalence of social phobia was estimated to range between 0.5% and 16%. Community surveys assessing the lifetime prevalence of social phobia according to the DSM-III criteria—by using the Diagnostic Interview Schedule (DIS, Robins et al. 1981)—found lifetime prevalence rates of DSM-III social phobia to range from 0.5% to 3.0%, while more recently conducted surveys assessing social phobia according to DSM-IV by using the Composite International Diagnostic Interview (CIDI; WHO 1990) have found considerably higher lifetime prevalence rates. For example, in the U.S. NCS (Kessler et al. 1994) DSM-III-R social phobia was found to have lifetime prevalence rate of 13.3%. As part of the Munich Early Developmental Stages of Psychopathology Study (EDSP;

Table 3 Lifetime prevalence of specific phobias according to the specific stimuli and situations in the NCS (adapted from Curtis et al. 1998)

Stimulus/situation	Lifetime prevalence (%)
Height	5.3
Flying	3.5
Close spaces	4.2
Being alone	3.1
Storms	2.9
Animals	5.7
Blood	4.5
Water	3.4
Any	11.3

Wittchen et al. 1998a; Lieb et al. 2000a), lifetime prevalence of DSM-IV social phobia was investigated in a community sample of 14- to 24-year-olds. Using a computerized version of the CIDI (DIAX/M-CIDI; Wittchen and Pfister 1997), the lifetime prevalence of social phobia was found to be 3.5% among adolescents and young adults. Table 2 shows that for GAD among adults, the estimated lifetime prevalence rates range from a low of 1.9% in Switzerland (Wacker et al. 1992) to a high of 31.1% in New Zealand (Wells et al. 1989). Most estimates range between 2.3 and 4.5%. For agoraphobia, lifetime prevalence rates between 0.4% and 10.9% have been reported across the studies. OCD and panic disorder seem to be less frequent in the general population, with lifetime prevalence rates between 0.5% and 3.2% and 0.5% and 4.5%, respectively. Compared to the other anxiety disorder, less is known about the frequency of PTSD in the general population, since only a few studies before DSM-IV included the assessment of PTSD. With the exception of the relatively high estimates of 7.8% and 11.7% for U.S. samples (Kessler et al. 1995; Turner and Gil 2002), studies outside the U.S. found consistently low lifetime prevalence rates, ranging from 0.2% to 3.0%.

Table 2 also indicates that the prevalence estimates for 12-month, 6-month and point prevalences are lower when compared to the lifetime estimates. This can be seen as one indicator of the fluctuating character of anxiety disorders. As discussed above, variation across studies is probably mainly due to differences in study characteristics. Overall, the 12-month prevalence rates for any anxiety disorder result in an estimated median of 11%, indicating that 1 in 10 people were affected by an anxiety disorder in the year preceding the assessment.

2.2 Age of Onset

Epidemiological studies in which age of first manifestation of anxiety was investigated consistently show that, with the exception of panic disorder and generalized anxiety disorder, anxiety disorders seem to start early in life, in the first and second decade of life.

Data from the WHO International Consortium in Psychiatric Epidemiology (ICPE), which carried out cross-national comparative studies on the prevalence and correlates of mental disorders, investigated the distribution of age of onset for the overall diagnostic group of anxiety disorder including panic disorder, agoraphobia, simple phobia, social phobia and generalized anxiety disorder. Fig. 1 shows graphically the findings that this group obtained across six countries.

In these analyses, the Kaplan-Meier method was used to generate age-of-onset-curves. Figure 1 shows not only that the onset distributions were similar across countries, but also that more than 50% of the cases had their first onset before age 20. Even the proportion of individuals with a first manifestation of anxiety disorder before age 10 is remarkably high. After age 40, the risk for

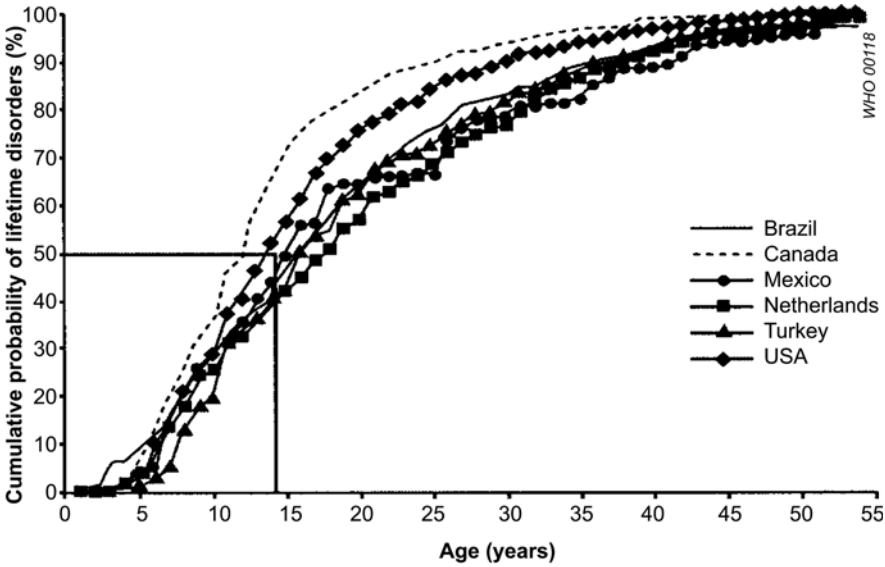

Fig. 1 Age of onset distribution of any anxiety disorders in the ICPE surveys (WHO-ICPE-Analyses, Andrade et al. 2000; reprinted with permission)

first onset of an anxiety disorder becomes lower. In the ICPE analyses, anxiety disorders were estimated to have a median age of onset of 15 years, ranging from 12 years in Canada to 18 years in the Netherlands (Andrade et al. 2000). Similar results have also been obtained in the German Mental Health Survey as part of the German National Health Interview and Examination Survey (GHS-MHS; Jacobi et al. 2004). Data of this population survey suggest the median of retrospectively reported first onset of anxiety disorder to be at age 18.

Regarding the specific types of anxiety disorders, specific and social phobia show the earliest manifestations (see Wittchen et al. 1999a). The main risk period for these anxiety disorders lies in childhood or adolescence, and after age 20 the probability for first onset considerably decreases. In contrast, generalized anxiety disorder, panic disorder and OCD manifest somewhat later, during late adolescence until middle adulthood (Burke et al. 1990; Magee et al. 1996; Wittchen et al. 1999a). Thus, for generalized anxiety disorder, remarkable risks of onset begin in the teens but then cumulate through the 50s (Bijl et al. 1998; Kessler et al. 2002). For panic disorder, ECA results suggest the average age of onset to be at the end of the third decade. The ECA data further suggest different risk periods for males and females; the probability for first onset was highest between ages 30 and 44 years for females and between ages 30 and 44 years for males. Recent results, however, from the Munich EDSP study suggest that first onset of panic disorder can already be observed during early adolescence (Wittchen et al. 1998b).

Data on retrospectively reported age of first onset of OCD suggest that the second and third decade in life seem to be a critical period for first manifestation. Thus, partially dependent on the age range of the study sample, mean ages of first onset for OCD have been reported to range between 12.8 (Flament et al. 1988) and 35.5 years (Weissman et al. 1994; Degonda et al. 1992; Grabe et al. 2001). Also using retrospective collected age-of-onset information but applying the more sophisticated life table methods, the ECA study found highest hazard rates between age 15 and 39 years, suggesting this age frame as most important for the first onset of OCD (Burke et al. 1990).

2.3 Correlates

2.3.1 Gender

Data from epidemiological studies consistently have shown that anxiety disorders are more common in women than in men. On average, anxiety disorders are about twice as frequent in women (Kessler et al. 1994; Alonso et al. 2004; Jacobi et al. 2004). Although there are variations across the specific forms of anxiety disorders (female:male ratio ranging between 1.5 and 2.5), the overall higher risk for women remains stable. The lifetime and 12-month prevalences of agoraphobia, specific phobia, generalized anxiety disorder, panic disorder and posttraumatic stress disorders are approximately twice as prevalent among women as men (Eaton et al. 1991; Kessler et al. 1994; Magee et al. 1996; Bijl et al. 1998; Alonso et al. 2004; Jacobi et al. 2004). Across the surveys, smaller sex differences were found for social phobia and OCD (Magee et al. 1996; Bijl et al. 1998; Alonso et al. 2004; Jacobi et al. 2004).

2.3.2 Sociodemographic Factors

Apart from gender, other reported sociodemographic correlates for anxiety disorders include education (Eaton et al. 1991; Magee et al. 1996; Bijl et al. 1998; Wittchen et al. 1998a; Andrews et al. 2001), marital status (Bland et al. 1988a,b; Regier et al. 1993; Magee et al. 1996; Andrews et al. 2001; Alonso et al. 2004; Jacobi et al. 2004), urbanicity (Magee et al. 1996; Bijl et al. 1998; Wittchen et al. 1998a; Andrews et al. 2001; Alonso et al. 2004), employment status (Magee et al. 1996; Bijl et al. 1998; Andrews et al. 2004; Alonso et al. 2004; Jacobi et al. 2004) and financial situation (Eaton et al. 1991; Kessler et al. 1994; Bijl et al. 1998; Wittchen et al. 1998a).

2.4 Risk Factors

2.4.1 Family–Genetic Factors

One of the major risk factors for the development of an anxiety disorder is a family history of psychopathology. In several epidemiological studies the familial aggregation of anxiety disorders was demonstrated (Angst 1998; Kendler et al. 1997; Kessler et al. 1997; Bromet et al. 1998; Lieb et al. 2000b; Wittchen et al. 2000a; Chartier et al. 2001; Bijl et al. 2002). On the basis of the Munich EDSP-study, Lieb et al. (2000b) could demonstrate that offspring of parents with social phobia have an increased risk for social phobia vs offspring mentally healthy of parents (see Fig. 2). This study found, in addition, that risk for social phobia seems also to be elevated among offspring of parents with other psychopathology, e.g. other anxiety disorders, depression or alcohol use disorders, suggesting a familial cross-transmission of these disorders.

In another study, Lieb et al. (2002) confirmed the cross-aggregation of anxiety disorders and depression by showing that offspring of parents with depressive disorders have not only an elevated risk for depressive disorders but also for anxiety disorders. Considering parental comorbidity, the cross-aggregation between parental depression and general anxiety disorder in off-

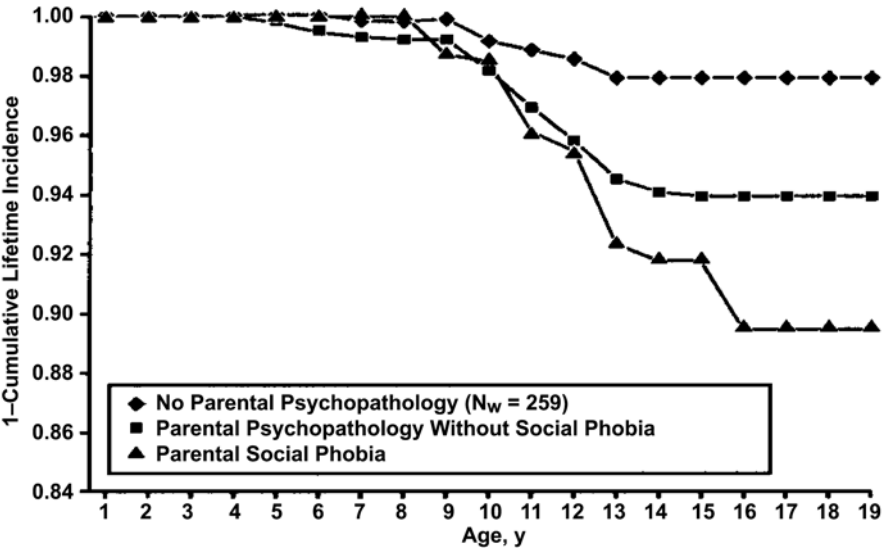

Fig. 2 Onset of social phobia among respondents with parents with social phobia, parents with psychopathology, excluding social phobia, and those whose parents had no psychopathology (Lieb et al. 2000; from *Arch Gen Psychiatry*, 57:859–66, Fig. 563 therein Copyright (2000) by permission of American Medical Association. All rights reserved)

spring remained significant. These results are similar to the results of Kendler et al. (1997) who investigated the familial aggregation of mental disorders by using the family history data of the NCS. Although these researchers found some specificity in the familial transmission of generalized anxiety disorder, the cross-aggregation between major depression and generalized anxiety disorder remained stable after controlling for comorbidity. The influence of a family history of anxiety disorders on the risk to develop anxiety disorders was also demonstrated in several studies by using the family- and high-risk design (Hettema et al. 2001). Since the genetic epidemiology of anxiety disorder is intensively discussed in another chapter (see Merikangas and Low, this volume), further results will not be discussed in more detail here.

2.4.2 Behavioural Inhibition and Parenting Style

Behavioural inhibition describes the tendency to be shy, timid and constrained in unfamiliar situations (Kagan et al. 1984).This disposition is very stable, can be observed early in life and is assumed to be genetically determined. Offspring of parents with anxiety disorders show higher behavioural inhibition than offspring of parents without anxiety disorders (Rosenbaum et al. 1991). Behavioural inhibition has seldom been evaluated in epidemiological studies. However, those that included it consistently found associations between behavioural inhibition during childhood and subsequent development of anxiety disorders. Inconsistent findings, however, have been reported regarding the specificity of behavioural inhibition, i.e. whether behavioural inhibition increases specifically the risk for specific forms of anxiety disorders (social anxiety), all anxiety disorders or other mental disorders (Wittchen et al. 2000a; Biederman et al. 2001).

Considering the influence of parenting style in the development of anxiety disorders, the available epidemiological studies present a rather inconsistent picture (Ernst and Angst 1997; DeWit et al. 1999; Magee 1999; Wittchen et al. 2000a). For social phobia, Lieb et al. (2000a) demonstrated on the basis of the prospective-longitudinal EDSP study, that specifically parental overprotection and rejection seem to increase children's risk for developing this anxiety disorder. In contrast, aspects of family climate could not be shown to be associated with an increased risk for anxiety disorders (Chartier et al. 2001; Merikangas et al. 2002).

2.4.3 Life Events

The impact of life events as potential risk factor in the development of anxiety disorders has been evaluated in several epidemiological studies. In almost all studies evidence was found for an association between childhood adversities

and the subsequent development of anxiety disorders (Ernst et al. 1993; Fergusson et al. 1996; Kessler et al. 1997; Bijl et al. 1998; Chartier et al. 2001; DeGraaf et al. 2002). Molnar et al. (2001) evaluated on the basis of the NCS data the relationship between child sexual abuse and subsequent mental disorders. They found that, among women, child sexual abuse increases the risk for agoraphobia, panic disorder, posttraumatic stress disorder and social phobia. Among men, only posttraumatic stress disorder was associated with child sexual abuse. Similar specific findings were recently reported by MacMillan et al. (2001) who found significant associations between child sexual abuse and subsequent anxiety disorders only among women. Other life events that have been investigated include parental divorce, death of parents and early separation from parents, but to date these factors have not consistently been proved as risk factors for the development of anxiety disorders.

2.5 Comorbidity

The term comorbidity was developed in the context of chronic diseases and was defined by Feinstein (1970) as "any distinct additional clinical entity that has existed or that may occur during the clinical course of a patient who has the index disease under study" (pp. 456–457). In psychiatric epidemiology, comorbidity describes the co-occurrence of at least two mental disorders within the same person within a defined time period (e.g. lifetime, 12 months; Maser and Cloninger 1990; Wittchen 1996). The lifetime perspective of comorbidity is specifically important for the identification of the temporal patterns of comorbidity, which is especially important for the development of models about the pathogenetic relationship between different forms of mental disorders (see Merikangas and Stevens 1998). Studies of diagnostic patterns in general population samples (e.g. Kessler et al. 1996; Merikangas et al. 1998; Kessler 2001; Jacobi et al. 2004) and in clinical samples (e.g. Mezzich et al. 1990; Sartorius et al. 1996) have shown that comorbidity among anxiety disorders is highly prevalent. The ECA investigators were the first to demonstrate that comorbidity is widespread among subjects with a lifetime history of an anxiety disorder and that comorbidity seems more the rule than the exception; more than two third of subjects with lifetime DSM-III anxiety disorders meet additional lifetime criteria for at least one other mental disorder (Robins et al. 1991). Similar results were found in the NCS: over 70% of the respondents with a lifetime history of at least one anxiety disorder also had another mental disorder (Kessler et al. 1994), with highest comorbidity rates for panic disorder (92%) and generalized anxiety disorder (Kessler 1997). Also findings of the more recently conducted German GHS-MHS are consistent with this pattern: 62% of subjects with a 12-month diagnosis of DSM-IV anxiety disorder were found to have a second 12-month diagnosis as well (Jacobi et al. 2004). Comparable to the NCS results, highest comorbidity rates were found for panic disorder (88%)

and generalized anxiety disorder (94%). In the GHS-MHS population sample, more than half of the subjects with panic disorder or generalized anxiety disorder, more than 60% with OCD, and more than 20% of the subjects with a phobic disorder fulfilled diagnostic criteria for three or more other mental disorders. All these findings suggest that the co-occurrence of anxiety disorders with other mental disorders is a pervasive feature of anxiety disorders. However, although epidemiological studies have shown that comorbidity in anxiety disorders is a valid phenomenon, the meaning of comorbidity is still poorly understood. Although several models have been proposed to explain comorbidity (Kessler and Price 1993), we are just beginning to understand its pathogenetic and treatment implications.

2.5.1 Comorbidity with Affective Disorders

Several population-based studies have consistently found a remarkable association between anxiety disorders and affective disorders, particularly with major depression (Weissman et al. 1994; Angst 1993; Lewinsohn et al. 1997; Merikangas et al. 1998; Regier et al. 1998; Kessler 2001). According to NCS data, subjects with an anxiety disorder have an almost five times greater chance of developing major depression, compared to subjects without any anxiety disorder (Kessler 2001). Cross-sectional studies that have investigated the temporal pattern of onset of anxiety and depression in comorbid cases have demonstrated that major depression generally develops secondary to anxiety, suggesting that anxiety disorders increase the risk for subsequent depression (Kessler et al. 1996; Regier et al. 1998). Recently, several prospective analyses of the EDSP study have shown that indeed almost all forms of anxiety disorders increase the risk for first onset of major depression (Wittchen et al. 2000a; Stein et al. 2001; Bittner et al. 2004). Together, on the basis of the available empirical evidence, it can be concluded that primary anxiety disorders increase the risk of developing a secondary depressive disorder.

2.5.2 Comorbidity with Substance Use Disorders

Epidemiological studies have also documented the comorbidity between anxiety disorders and substance use disorders. In the U.S. NCS, one in five people with a lifetime history of a DSM-III-R anxiety disorder fulfilled, in addition, diagnostic criteria for alcohol dependence (range across specific forms of anxiety disorders: 21%–30%) and about 15% fulfilled criteria for drug dependence (range 15%–23%; Kessler et al. 1996). In a more recent cross-sectional investigation of patterns of co-morbidity between substance use and anxiety disorders in six studies participating in the ICPE (Merikangas et al. 1998), the investigators found across all sites strong associations between anxiety disor-

ders and alcohol and drug dependence. The odds ratios (ORs) as a measure of association were ranging between 1.8 and 2.7 for alcohol dependence and between 3.3 and 5.2 for drug dependence. Considering the observed ranges of associations within the specific substance dependencies, the available epidemiological findings do not argue for single combinations of disorders having consistently stronger associations than others. Risks rather seem to be of similar magnitude. The ICPE analyses also investigated the temporal ordering of the onset of the comorbid disorders and found that in general, anxiety disorders precede the onset of substance problems/disorders. Applying more sophisticated prospective analyses, Zimmermann et al. (2003) could demonstrate based on the 4-year follow-up data of the EDSP that specifically panic disorder and social phobia are predictors of subsequent alcohol problems among adolescents and young adults.

Concerning the comorbidity between anxiety disorders and nicotine dependence, less epidemiological research findings are available. Those studies that investigated this issue, however, argue for an association between nicotine dependence and anxiety disorders (Breslau et al. 1994; Johnson et al. 2000; Sonntag et al. 2000). Recently published EDSP findings have shown a prospective association specifically between prior nicotine dependence panic and the development of subsequent (Isensee et al. 2003).

2.5.3 Comorbidity Within the Anxiety Disorders

Although less studied, epidemiological investigation has also shown that there is a considerable degree of overlap within the anxiety disorders. In the NCS, associations (in terms of ORs) within different forms of anxiety disorders were found to range between 3.8 and 12.3 for generalized anxiety disorder, 5.8 and 11.9 for agoraphobia, 4.9 and 8.5 for specific phobia, and 3.8 and 7.8 for social phobia (Wittchen et al. 1994; Magee et al. 1996). The strongest comorbidity was found between panic disorder and agoraphobia, due to the fact that agoraphobia with panic disorder and agoraphobia without panic were not distinguished in the diagnostic criteria of agoraphobia. Interestingly, only about one third of the respondents who meet criteria for DSM-III-R agoraphobia additionally reported panic attacks. This result confirms earlier results found in the ECA and Zurich study (Angst and Dobler-Mikola 1985; Weissman et al. 1986) that panic seems to be involved only in a minority of people with agoraphobia. Similar findings have recently been obtained in the general population sample of the EDSP study. Wittchen et al. (1998b) demonstrated that among adolescents and young adults, most subjects with agoraphobia reported nether full nor limited panic attacks or panic experiences. Other analyses from this study suggest that panic attacks seem to be rather unspecific for the development of subsequent disorder, since pre-existing panic attacks prospectively increased the risk of onset of any secondary anxiety disorder, social phobia, specific

phobia or generalized anxiety disorder, as well as of any secondary alcohol use disorder (Goodwin et al. 2004).

3 Summary

The studies reviewed here have shown than anxiety disorders are common mental disorders in the general population. Overall, anxiety disorders typically start early in life and have a high degree of comorbidity with other anxiety, affective and substance use disorders. Comorbid anxiety disorders, specifically specific and social phobia, are often the temporally primary disorders and are associated with an elevated risk for the subsequent onset of psychopathology. The observation that temporally primary anxiety disorders increase the risk for secondary psychopathology raises the question of whether early prevention would prevent the onset of subsequent psychopathology. More epidemiological analyses and findings are needed to fully understand the mechanisms of comorbidity: Why do people with primary anxiety develop secondary affective or substance use disorders? Specifically longitudinal surveys that include such early manifestations of anxiety disorders are needed in order to understand the developmental pathway from anxiety to subsequent psychopathology. Not discussed in this reviews are findings concerning impairments associated with anxiety disorders and patterns of treatment seeking. Briefly, several studies have demonstrated that people with anxiety disorders experience reduced quality of life as well as remarkable impairment in work productivity and role functioning (Magee et al. 1996; Wittchen et al. 2000b). Other studies have demonstrated that anxiety disorders are associated with substantial costs to the health care systems (Greenberg et al. 1999). To conclude, anxiety disorders are prevalent and serious health concerns that should be taken in both practice and science as seriously as mood or substance use disorders. However, further epidemiological research is warranted in order to elucidate the various components involved into the aetiology of anxiety disorders as well as to learn more about the mechanisms by which anxiety disorders lead to other psychopathology.

References

Alonso J, Angermeyer MC, Bernert S, et al (2004) Prevalence of mental disorders in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. Acta Psychiatr Scand Suppl 420:21–27

Andrade L, Caraveo-Anduaga JJ, Berglund P, Bijl R, Kessler RC, Demler O, Walters E, Kylyc C, Offord D, Ustun TB, Wittchen H-U (2000) Cross-national comparisons of the prevalences and correlates of mental disorders. Bull World Health Organ 78:413–426

Andrews G, Henderson S, Hall W (2001) Prevalence, comorbidity, disability and service utilisation. Overview of the Australian Mental Health Survey. Br J Psychiatry 178:145–153

Angst J (1993) Comorbidity of anxiety, phobia, compulsion and depression. Int Clin Psychoneuropharm 8(Suppl 1):21–25

Angst J (1998) Panic disorder: history and epidemiology. Eur Psychiatry 13(Suppl 2):51–55

Angst J, Dobler-Mikola A (1985) The Zurich Study. V. Anxiety and phobia in young adults. Eur Arch Psychiatry Neurol Sci 235:171–178

Becker ES, Türke V, Neurmer S, Soeder U, Krause P, Margraf J (2000) Incidence and prevalence rates of mental disorders in a community sample of young women: results of the "Dresden Study". In: Manz R, Kirch W (eds) Public health research and practice: report for the Public Health Research Association, Saxony. Roderer, Regensburg, pp 259–291

Biederman J, Hirshfield-Becker DR, Rosenbaum JF, Hérot C, Friedman D, Snidman N, Kagan J, Faraone SV (2001) Further evidence of association between behavioural inhibition and social anxiety in children. Am J Psychiatry 158:1673–1679

Bijl RV, Ravelli A, van Zessen G (1998) Prevalence of psychiatric disorder in the general population: results of The Netherlands Mental Health Survey and incidence Study (NEMESIS). Soc Psychiatry Psychiatr Epidemiol 33:587–595

Bijl RV, Cuijpers P, Smit F (2002) Psychiatric disorders in adult children of parents with a history of psychopathology. Soc Psychiatry Psychiatr Epidemiol 37:7–12

Bittner A, Goodwin RD, Wittchen HU, Beesdo K, Höfler M, Lieb R (2004) What characteristics of primary anxiety disorders predict subsequent major depression? J Clin Psychiatry 65:618–626

Bland RC, Newman SC, Orn H (1988a) Age of onset of psychiatric disorders. Acta Psychiatr Scand 77(Suppl 338):43–49

Bland RC, Orn H, Newman SC (1988b) Lifetime prevalence of psychiatric disorders in Edmonton. Acta Psychiatr Scand 77(Suppl 338):24–32

Bourdon KH, Boyd JH, Rae DS, Burns BJ, Thompson JW, Locke BZ (1988) Gender differences in phobias: results of the ECA community study. J Anxiety Disord 2:227–241

Breslau N, Kilbey MM, Andreski P (1994) DSM-III-R nicotine dependence in young adults: prevalence, correlates and associated psychiatric disorders. Addiction 89:743–754

Bromet E, Sonnega A, Kessler RC (1998) Risk factors for DSM-III-R posttraumatic stress disorder: findings from the National Comorbidity Survey. Am J Epidemiol 147:353–361

Brown TA, Barlow DH (2002) Classification of anxiety and mood disorders. In: Barlow D (ed) Anxiety and its disorders: the nature and treatment of anxiety and panic, 2nd edn. Guillford Press, New York, pp 292–327

Burke KC, Burke JD, Regie DA, Rae DS (1990) Age at onset of selected mental disorders in five community populations. Arch Gen Psychiatry 47:511–518

Canino GS, Bird HR, Shrout PE, Rubio-Stipec M, Bravo M, Martinez R, Sesman M, Guevara LM (1987) The prevalence of specific psychiatric disorders in Puerto Rico. Arch Gen Psychiatry 44:727–735

Carter RM, Wittchen H-U, Pfister H, Kessler R (2001) One-year prevalence of subthreshold and threshold DSM-IV generalized anxiety disorder in a nationally representative sample. Depress Anxiety 13:78–88

Chartier MJ, Walker JR, Stein MB (2001) Social phobia and potential childhood risk factors in a community sample. Psychol Med 31:307–315

Curtis GC, Magee WJ, Eaton WW, Wittchen HU, Kessler RC (1998) Specific fears and phobias. Epidemilogy and classification. Br J Psychiatry 173:212–217

de Graaf R, Bijl R, SmitFilipVollebergh WAM, Spijker J (2002) Risk factors for 12-month comorbidity of mood, anxiety, and substance use disorders: findings from the Netherlands Mental Health Survey and Incidence Study. Am J Psychiatry 159:620–629

Degonda M, Wyss M, Angst J (1992) The Zurich Study. XVIII. Obsessive-compulsive disorders and syndromes in the general population. Eur Arch Psychiatry Clin neurosci 243:16–22

DeWit DJ, Ogborne A, Offord DR, MacDonald K (1999) Antecedents of the risk of recovery from DSM-III-R social phobia. Psychol Med 29:569–582

DSM-III (1980) American Psychiatric Association diagnostic and statistical manual of mental disorders, 3rd edn. American Psychiatric Press, Washington

DSM-III-R (1987) Diagnostic and statistical manual of mental disorders, 3rd edn, revised. American Psychiatric Press, Washington

DSM-IV (1994) Diagnostic and statistical manual of mental disorders, 4th edn. American Psychiatric Press, Washington

DSM-IV-R (2000) Diagnostic and statistical manual of mental disorders, 4th edn, revised. American Psychiatric Press, Washington

Eaton WW, Dryman A, Weissman MM (1991) Panic and phobia. In: Robins LN, Regier DA (eds) Psychiatric disorders in America. The Epidemiologic Catchment Area Study. The Free Press, New York, pp 155–179

Ernst C, Angst J (1997) The Zurich Study XXIV. Structural and emotional aspects of childhood and later psychopathology. Eur Arch Psychiatry Clin Neurosci 247:81–86

Ernst C, Angst J, Földényi M (1993) The Zurich Study. XVII Sexual abuse in childhood. Frequency and relevance for adult morbidity data of a longitudinal epidemiological study. Eur Arch Psychiatry Clin Neurosci 242:293–300

Faravelli C, Guerinni Degl'Innocenti B, Giardinelli L (1989) Epidemiology of anxiety disorders in Florence. Acta Psychiatr Scand 79:308–312

Feinstein A (1970) The pre-therapeutic classification of comorbidity in chronic disease. J Chronic Dis 23:455–468

Fergusson DM, Horwood J, Lynskey MT (1996) Childhood sexual abuse and psychiatric disorder in young adulthood: II. Psychiatric outcomes of childhood sexual abuse. J Am Acad Child Adolesc Psychiatry 34:1365–1374

Flament MF, Whitaker A, Rapaport JL, Davies M, Berg CZ, Kalikow K, Sceery W, Shaffer D (1988) Obsessive compulsive disorder in adolescence: An epidemiological study. J Am Acad Child Adolesc Psychiatry 27:764–771

Goodwin RD, Lieb R, Höfler M, Pfister H, Bittner A, Beesdo K, Wittchen HU (2004) Panic attack as a risk factor for severe psychopathology among young adults. Am J Psychiatry 161:2207–2214

Grabe HJ, Meyer C, Hapke U, Rumpf HJ, Freyberger HJ, Dilling H, John U (2001) Lifetime-comorbidity of obsessive-compulsive disorder and subclinical obsessive-compulsive disorder in northern Germany. Eur Arch Psychiatry Clin Neurosci 251:130–135

Hettema JM, Neale MC, Kendler KS (2001) A review and meta-analysis of the genetic epidemiology of anxiety disorders. Am J Psychiatry 158:1568–1578

Isensee B, Wittchen HU, Stein MB, Höfler M, Lieb R (2003) Smoking increases the risk of panic: findings from a prospective community study. Arch Gen Psychiatry 60:692–700

Jacobi F, Wittchen HU, Hölting M, Höfler M, Pfister H, Müller N, Lieb R (2004) Prevalence, co-morbidity and correlates of mental disorders in the general population: results from the German Health Interview and Examination Survey (GHS). Psychol Med 34:1–15

Johnson JG, Cohen P, Pine DS, Klein DF, Kasen S, Brook JS (2000) Association between cigarette smoking and anxiety disorders during adolescence and early adulthood. JAMA 284:2348–2351

Kagan J, Reznick JS, Clarke C, Snidman N, Garcia-Coll C (1984) Behavioral inhibition to the unfamiliar. Child Dev 55:2212–2225

Kendler KS, Davis CG, Kessler RC (1997) The familial aggregation of common psychiatric and substance use disorders in the National Comorbidity Survey: a family history study. Br J Psychiatry 170:541–548

Kessler RC (1997) The prevalence of psychiatric comorbidity. In: Wetzler S, Sanderson WC (eds) Treatment strategies for patients with psychiatric comorbidity. Wiley, New York, pp 23–48

Kessler RC (2001) Comorbidity of depression and anxiety disorders. In: Montgomery SA, den Boer JA (eds) SSRIs in depression and anxiety. Wiley, Chichester, pp 87–106

Kessler RC, Price RH (1993) Primary prevention of secondary disorders: a proposal and agenda. Am J Community Psychol 21:607–633

Kessler RC, McGonagle KA, Zhao S (1994) Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. Results from the National Comorbidity Survey. Arch Gen Psychiatry 51 (1):8–19

Kessler RC, Sonnega A, Bromet E, Hughes M, Nelson CB (1995) Posttraumatic stress disorder in the National Comorbidity Survey. Arch Gen Psychiatry 52:1048–1060

Kessler RC, Nelson CB, McGonagle KA, Edlund MJ, Frank RG, Leaf PJ (1996) The epidemiology of co-occurring addictive and mental disorders: implications for prevention and service utilization. Am J Orthopsychiatry 66:17–31

Kessler RC, Crum RM, Warner LA, Nelson CB, Schulenberg J, Anthony JC (1997a) Lifetime co-occurrence of DSM-III-R alcohol abuse and dependence with other psychiatric disorders in the National Comorbidity Survey. Arch Gen Psychiatry 54:313–321

Kessler RC, Davis CG, Kendler KS (1997b) Childhood adversity and adult psychiatric disorder in the US National Comorbidity Survey. Psychol Med 27:1001–1119

Kessler RC, Andrade LH, Bijl RV, Offord DR, Demler OV, Stein DJ (2002) The effects of co-morbidity on the onset and persistence of generalized anxiety disorder in the ICPE surveys. Psychol Med 32:1213–1225

Klein DF (1964) Delineation of two drug responsive anxiety syndromes. Psychopharmacologia 5:397–408

Kringlen E, Torgerson S, Cramer V (2001) A Norwegian psychiatric epidemiological study. Am J Psychiatry 158:1091–1098

Lee CK, Kwak YS, Yamamoto J, et al (1990) Psychiatric epidemiology in Korea. Part I: Gender and age differences in Seoul. J Nerv Ment Dis 178:242–246

Lewinsohn PM, Zinbarg R, Seeley JR, Lewinsohn M, Sack WH (1997) Lifetime comorbidity among anxiety disorders and between anxiety disorders and other mental disorders in adolescents. J Anxiety Disord 11:377–394

Lieb R, Isensee B, von Sydow K, Wittchen HU (2000a) The early stages of psychopathology study (EDSP): a methodological update. Eur Addict Res 6:170–182

Lieb R, Wittchen HU, Höfler M, Fuetsch M, Stein M, Merikangas KR (2000b) Parental psychopathology, parenting styles, and the risk of social phobia in offspring. A prospective-longitudinal community study. Arch Gen Psychiatry 57:859–866

Lieb R, Isensee B, Höfler M, Pfister H, Wittchen HU (2002) Parental major depression and the risk of depressive and other mental disorders in offspring: a prospective-longitudinal community study. Arch Gen Psychiatry 59:365–374

MacMilian HL, Fleming JE, Streiner DL, Lin E, Boyle MH, Jamieson E, Duku EK, Walsh CA, Wong MYY, Beardslee WR (2001) Childhood abuse and lifetime psychopathology in a community sample. Am J Psychiatry 158:1878–1883

Magee WJ (1999) Effects of negative life experiences on phobia onset. Soc Psychiatry Psychiatr Epidemiol 34:343–351

Magee WJ, Eaton WW, Wittchen HU, McGonagle KA, Kessler RC (1996) Agoraphobia, simple phobia and social phobia in the National Comorbidity Survey. Arch Gen Psychiatry 53:159–168

Marshall RD, Klein DF (2003) Conceptual antecedents of the anxiety disorders. In: Nutt D, Ballenger J (eds) Anxiety disorders. Blackwell, Oxford, pp 3–22

Maser JD, Cloninger CR (1990) Comorbidity of anxiety and mood disorders: introduction and overview. In: JD Maser, CR Clonninger (eds) Comorbidity of mood and anxiety disorders. American Psychiatric Press, Washington, pp 3–12

Merikangas KR, Mehta RL, Molnar BE, Walters EE, Swendsen JD, Aguilar-Gaziola S, Bijl R, Borges G, Caraveo-Anduaga JJ, Dewit DJ, Kolody B, Vega WA, Wittchen HU, Kessler RC (1998) Comorbidity of substance use disorders with mood and anxiety disorders: results of the international consortium in psychiatric epidemiology. Addict Behav 23:893–907

Merikangas KR, Stevens DE (1998) Models of transmission of substance use and comorbid psychiatric disorders. In: Kranzler HR, Rounsaville BJ (eds) Dual diagnosis and treatment. New York: Marcel Dekker, pp 31–53

Merikangas KR, Avenevoli S, Acharyya S, Zhang H, Angst J (2002) The spectrum of social phobia in the Zurich Cohort Study of young adults. Biol Psychiatry 51:81–91

Meyer C, Rumpf H-J, Hapke U, Dilling H, John U (2000) Lebenszeitprävalenz psychischer Störungen in der erwachsenen Allgemeinbevölkerung. Nervenarzt 71:535–542

Mezzich JE, Ahn CW, Fabrega H, Pilkonis PA (1990) Patterns of psychiatric comorbidity in a large population presenting for care. In: Maser JD, Cloninger CR (eds) Comorbidity of mood and anxiety disorders. American Psychiatric Press, Washington, pp 189–204

Molnar BE, Buka SL, Kessler RC (2001) Child sexual abuse and subsequent psychopathology: results from the National Comorbidity Survey. Am J Public Health 91:753–760

Offord DR, Boyle MH, Campbell D, Goering P, Lin E, Wong M, Racine YA (1996) One-year prevalence of psychiatric disorder in Ontarians 15 to 64 years of age. Can J Psychiatry 41:559–563

Regier DA, Narrow WE, Rae DS (1990) The epidemiology of anxiety disorders. The Epidemiologic Catchment Area (ECA) experience. J Psychiatr Res 24(Suppl 2):3–14

Regier DA, Farmer ME, Rae DS, Mayers JK, Kramer M, Robins LN, George LK, Karno M, Locke BZ (1993) One-month-prevalence of mental disorders in the United States and sociodemographic characteristics: The Epidemiologic Catchment Area Study. Acta Psychiatr Scand 88:35–47

Regier DA, Rae DS, Narrow WE, Kaelber CT, Schatzberg AF (1998) Prevalence of anxiety disorders and their comorbidity with mood and addictive disorders. Br J Psychiatry 34:24–28

Robins LN, Helzer JE, Croughan J, Ratcliff KS (1981) National Institute of Mental Health Diagnostic Interview Schedule: its history, characteristics, and validity. Arch Gen Psychiatry 38:381–389

Robins LN, Locke BZ, Regier DA (1991) An overview of psychiatric disorders in America. In: Robins LN, Regier DA (eds) Psychiatric disorders in America. The Epidemiologic Catchment Area Study. The Free Press, New York, pp 328–366

Rosenbaum JF, Biederman J, Hirshfeld DR, Bolduc EA, Faraone SV, Kagan J, Snidman N, Reznick JS (1991) Further evidence of an association between behavioral inhibition and anxiety disorders: results from a family study of children from a non-clinical sample. J Psychiatr Res 25:49–65

Sartorius N, Üstün TB, Lecrubier Y, Wittchen HU (1996) Depression comorbid with anxiety: results from the WHO study on psychological disorders in primary health care. Br J Psychiatry 168(Suppl 30):29–34

Sonntag H, Wittchen HU, Höfler M, Kessler RC, Stein MB (2000) Are social fears and DSM-IV social anxiety disorder associated with smoking and nicotine dependence in adolescents and young adults. Eur Psychiatry 15:67–74

Stein MB, Fuetsch M, Müller N, Höfler M, Lieb R, Wittchen HU (2001) Social anxiety and the risk of depression. A prospective community study of adolescents and young adults. Arch Gen Psychiatry 58:251–256

Turner RJ, Gil AG (2002) Psychiatric and substance use disorders in South Florida. Racial/ethnic and gender contrasts in a young adult cohort. Arch Gen Psychiatry 59:43–50

Vega WA, Kolody B, Aguilar-Gaxiola S, Alderete E, Catalano R, Caraveo-Anduaga J (1998) Lifetime prevalence of DSM-III-R psychiatric disorders among urban and rural Mexican Americans in California. Arch Gen Psychiatry 55:771–778

Wacker HR, Müllejans R, Klein KH, Battegay R (1992) Identification of cases of anxiety disorders and affective disorders in the community according to ICD-10 and DSM-III-R by using the Composite International Diagnostic Interview (CIDI). Int J Methods Psychiatr Res 2:91–100

Weissman MM, Leaf PJ, Blazer DG, Boyd JH, Florio L (1986) The relationship between panic disorder and agoraphobia: an epidemiologic perspective. Psychopharmacol Bull 22:787–791

Weissman MM, Bland RC, Canino GJ, Greenwald S, Hwu HG, Lee CK, Newman SC, Oakley-Browne MA, Rubio-Stipec M, Wickramaratne PJ, et al (1994) The cross national epidemiology of obsessive-compulsive disorder: The Cross National Collaborative Group. J Clin Psychiatry 55 (Suppl):5–10

Wells JE, Bushnell JA, Hornblow AR, Joyce PR, Oakley-Browne MA (1989) Christchurch psychiatric epidemiology study. I. Methodology and lifetime prevalence for specific psychiatric disorders. Aust N Z J Psychiatry 23:315–326

Wittchen H-U, Jacobi F (2001) Die Versorgungssituation psychischer Störungen in Deutschland. Eine klinisch-epidemiologische Abschätzung des Bundesgesundheitssurveys 1998. BGG 44:993–1000

Wittchen H-U, Perkonigg A (1996) Epidemiologie psychischer Störungen. Grundlagen, Häufigkeit, Risikofaktoren und Konsequenzen. In: Ehlers A, Hahlweg K (eds) Enzyklopädie der Psychologie, Themenbereich D Praxisgebiete. Band 1, Grundlagen der Klinischen Psychologie. Hogrefe, Göttingen, pp 69–144

Wittchen HU (1993) Epidemiologie und Komorbidität. In: Holsboer F, Phillipp M (eds) Angststörungen. Pathogenese—Diagnostik—Therapie. SM Verlagsgesellschaft, Gräfelfing, pp 40–58

Wittchen HU (1996) What is comorbidity. Fact or artefact? (editorial). Br J Psychiatry 168(Suppl 30):7–8

Wittchen HU, Pfister H (1997) DIA-X-Interviews: Manuals für Screening Verfahren und Interview; Interviewheft Längsschnittuntersuchung (DIA-X-Lifetime); Ergänzungsheft Querschnittsuntersuchung (DIA-X-12 Monate); PC-Programm zur Durchführung des Interviews (Längs- und Querschnittuntersuchung), Auswertungsprogramm. Swets and Zeitlinger, Frankfurt

Wittchen HU, Essau CA, vn Zerssen D, Krieg JC, Zaudig M (1992) Lifetime and six-month prevalence of mental disorders in the Munich Follow-Up Study. Eur Arch Psychiatry Clin Neurosci 241:247–258

Wittchen HU, Zhao S, Kessler RC, Eaton WW (1994) DSM-III-R generalized anxiety disorder in the National Comorbidity Survey. Arch Gen Psychiatry 51:355–364

Wittchen HU, Nelson CB, Lachner G (1998a) Prevalence of mental disorders and psychosocial impairments in adolescents and young adults. Psychol Med 28:109–126

Wittchen HU, Reed V, Kessler RC (1998b) The relationship of agoraphobia and panic in a community sample of adolescents and young adults. Arch Gen Psychiatry 55:1017–1024

Wittchen HU, Lieb R, Schuster P, Oldehinkel AJ (1999a) When is onset? Investigations into early developmental stages of anxiety and depressive disorders. In: JL Rapaport (ed) Childhood onset of "adult" psychopathology, clinical and research advances. American Psychiatric Press, Washington, pp 259–302

Wittchen HU, Kessler RC, Pfister H, Höfler M, Lieb R (2000a) Why do people with anxiety disorders become depressed? A prospective-longitudinal community study. Acta Psychiatr Scand 102(Suppl 406):14–23

Wittchen HU, Carter RM, Pfister H, Montgomery SA, Kessler RC (2000b) Disabilities and quality of life in pure and comorbid generalized anxiety disorder and major depression in a national survey. Int Clin Psychopharmacol 15:319–328

World Health Organization (1990) Composite international diagnostic interview (CIDI, Version 1.0). World Health Organization, Geneva

Zimmermann P, Wittchen HU, Höfler M, Lieb R (2003) Primary anxiety disorders and the development of subsequent alcohol use disorders: a four-year community study of adolescents and young adults. Psychol Med 33:1211–1222