Subthreshold Syndromes of Depression and Anxiety in the Community

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Nearly 50% of individuals in the community meet threshold or subthreshold diagnostic criteria for depression or anxiety, with depression being far more common. Co-occurrence of anxiety and depression is common, as the majority of individuals who experience anxiety also manifest threshold- or subthreshold-level depression. In the current study, addition of subthreshold categories improved the coverage of treated cases in the community by nearly a third; 61% of subjects were diagnosed according to threshold criteria while 89% were diagnosed according to subthreshold categories. These results suggest that inclusion of subthreshold-level syndromes enhances the validity of diagnostic systems by increasing the proportion of treated cases that meet diagnostic criteria and by providing a more accurate representation of milder syndromes of depression and anxiety.

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The development of standardized diagnostic definitions has led to a dramatic improvement in communication and has enhanced the derivation of aggregate prevalence rates of psychiatric disorders on an international basis. However, application of these definitions at the community level has also raised questions about the validity of the diagnostic thresholds, as well as the boundaries between discrete classes of disorders. Large-scale community studies have revealed that these disorders are highly prevalent in the general population, yet only a minority actually receive treatment. Furthermore, the results of epidemiologic studies have demonstrated the high frequency of comorbidity, or the tendency for different classes of disorders to manifest within individuals more often than would be expected by chance. Thus, epidemiologic data have extended our knowledge about depression and anxiety derived from clinical samples to provide evidence regarding the range of expression of depression and other common syndromes, the course of these syndromes, and the patterns of co-occurrence—without the bias in severity and comorbidity characteristic of clinical samples.

The majority of large-scale epidemiologic studies have applied the contemporary diagnostic system in use at the time of the survey.[1] However, numerous studies have described the lack of applicability of the current diagnostic nomenclature to the community and primary care settings. Apart from examining the overlap of depression and anxiety in mild cases in the community, few studies have systematically examined the relevance and the validity of the diagnostic thresholds of the current diagnostic systems in community settings. Finlay-Jones et al.[2] and Bebbington et al.[3] examined the definitions of "caseness" for depression and anxiety in a series of community samples of women in the United Kingdom. Similarly, Goldberg and Huxley[4] concluded that the more common psychiatric syndromes encountered in primary care tend to be milder and manifest as mixed states of anxiety and depression. Wells et al.[5] also demonstrated the high frequency of individuals in medical settings who have mild depression and who fail to meet diagnostic criteria. Based on these findings and those that reveal a high frequency of mild depressive or anxiety syndromes[6,7] or mixed anxiety and depression in the community,[8] several investigators have urged the developers of more recent diagnostic systems to consider broader definitions of depression and anxiety to apply to these settings.

The introduction of the diagnostic concept of Recurrent Brief Depression (RBD) by Angst in 1984[9] provided a model of the systematic investigation of the components of the diagnostic criteria. Although the classification criteria for most disorders generally include a specified number of symptoms, duration, and level of impairment, Angst et al.[10]

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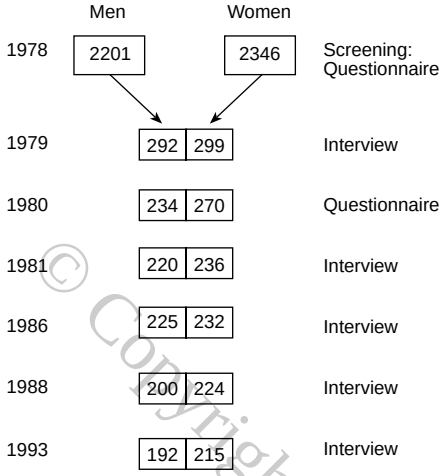
Figure 1. The Zurich Cohort Study: Number of Subjects, by Sex, Who Participated in Each Interview and the Date of Each Interview*



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demonstrated the importance of the inclusion of recurrence as a component of the diagnostic definition of depression. More recent work on the Zurich Cohort Study has revealed that several other diagnostic phenomena, including hypomania, neurasthenia, and anxiety, may also manifest in a recurrent, yet brief, fashion.[11]

In the current study, we have derived systematic definitions for the spectrum of depression and anxiety by varying the thresholds for each of the components of the current diagnostic definitions for both disorders. These definitions were then applied to data from the Zurich Cohort Study, a 15-year longitudinal study of a cohort of 591 subjects aged 19 to 20 years selected from the general community. The rates and sex differences in each of the threshold and subthreshold categories of depression and anxiety were determined. The validity of the subthreshold categories was then examined by assessing the degree to which subjects receiving treatment met diagnostic criteria for threshold and subthreshold levels of anxiety and depression over the 15-year period of observation.

METHOD

Subjects

The subjects were originally selected in 1978 from the total population of individuals aged 19 to 20 years in Zurich, Switzerland. Scores on the Symptom Checklist-90 (SCL-90)[12] were used to select the subjects. Two thirds were randomly selected from the population who scored highest (i.e., > 85th percentile) on the SCL-90 scale, and one third was randomly selected from the remainder of the population. This cohort has been followed for a period of 15 years, with direct interviews in 1979, 1981, 1986, 1988, and 1993. Figure 1 shows the number of subjects (by sex) who participated in each interview and the timing and intervals between each of the five interviews.[13] The sample for the current analyses comprised 591 individuals who were interviewed directly at least once over the 15-year period of the study.

Procedure

The major symptomatic criteria of psychiatric syndromes were determined by a direct interview, the Structured Psychopathological Interview and Rating of the Social Consequences for Epidemiology (SPIKE).[1] The SPIKE was administered by psychiatric residents and clinical psychologists who had extensive clinical training. This interview schedule assesses a number of somatic and psychological syndromes; screening probes are administered for each section, and symptoms, duration, frequency, severity, treatment history, and impairment are evaluated for every positive answer. Personal and family history of the syndromes are also assessed for all subjects, irrespective of their endorsement of the diagnostic screening question for each section.

The diagnostic assessments were designed to collect information about each major psychiatric syndrome, without restrictions, according to the threshold assigned to current diagnostic systems. This approach enabled us to develop operational definitions based on the major components of diagnostic criteria including symptoms, duration, frequency, severity, and recurrence. These criteria were applied to each of the five interviews to yield a cross-sectional, as well as longitudinal, classification of episodes of depression and anxiety over the 15-year period of the study.

Diagnostic Definitions

Systematic definitions were derived based on increasing levels of each of the components of depression. The definitions of depressive syndromes are shown in Table 1. Subthreshold definitions of depression ("d") included: "depressive symptoms," which required depressed mood with only 1 or 2 criterial symptoms; "minor depression," which required 3 or 4 symptoms of depression with a minimum duration of 2 weeks; "recurrent brief depression," which required 5 of 9 criterial symptoms with a monthly recurrence over a year; "work impairment," which required all the former criteria. The standard threshold category "D" of dysthymia and major depression, as defined by DSM-III-R criteria, was also applied.

Tables 2 and 3 show the definitions of threshold "A" and subthreshold "a" anxiety syndromes. "Subthreshold generalized anxiety disorder" required fewer symptoms of anxiety than the DSM-III-R criteria (i.e., 1–5 symptoms) but with the same duration as the criterial disorder. "Recurrent" and "brief" anxiety syndromes were also defined on the basis of fewer symptoms, briefer duration, and/or recurrent episodes of anxiety. "Subthreshold panic disor-

Table 1. Classification of Depression

Subtype	Symptoms	Subthreshold: Minor Depression	Subthreshold: Recurrent Brief Depression	Diagnosis: MDD	Diagnosis: Dysthymia
Depressed mood	Yes	Yes	Yes	Yes	Yes
Number of symptoms	≥ 1 of 9	1–4 of 9	≥ 5 of 9	≥ 5 of 9	≥ 3 of 13
Duration	No	≥ 2 wk	No	≥ 2 wk	≥ 2 y
Frequency	No	No	≥ 1/mo	No	No
Impairment	No	No	Yes	No	No

Table 2. Classification of Generalized Anxiety Disorder*

Criteria	Probe	Subthreshold: GAD	Subthreshold: Brief	Subthreshold: Recurrent	Diagnosis
Excessive worrying	Yes	Yes	Yes	Yes	Yes
Symptoms (of 4)	…	< 3	≥ 1	≥ 3	≥ 3
Duration	…	≥ 4 wk	2–3 wk	< 2 wk	≥ 4 wk
Frequency	…	No	No	≥ 3/mo	No

*Abbreviation: GAD = generalized anxiety disorder.

Table 3. Classification of Panic Disorder

Criteria	Subthreshold	Diagnosis
Symptoms (of 12)	≥ 4	≥ 4
Attack frequency	≥ 2 per y	3 in 3 wk

der" required the same symptom criteria as the DSM-III-R but a frequency of only two or more attacks per year (Table 3).

The threshold and subthreshold categories of depression and anxiety were cross-classified in a matrix to represent the mutually exclusive combinations of these syndromes across the longitudinal study (Table 4).

The cross-classification was based on the longitudinal co-occurrence of these syndromes across time and thus does not require concomitant manifestation of depression and anxiety. Thus, a subject who had threshold depression at the initial interview and subthreshold anxiety at the third and fourth interviews was classified as "Da," just as a subject who had both threshold depression and subthreshold anxiety simultaneously would have been classified at the fifth interview.

RESULTS

Table 5 shows the numbers and cumulative rates indicated by the longitudinal cross-classification by diagnostic level of depression and anxiety among the 591 subjects over a 15-year period. Approximately 65% of the subjects met criteria for either threshold or subthreshold depression or anxiety during at least one interview during the 15-year study. Although it would be expected that the frequency of subthreshold syndromes would exceed that of threshold-level syndromes, the results indicated that the rates of threshold and subthreshold depression were approximately equal (31.7% vs. 25.3%), whereas subthreshold anxiety was more common than threshold anxiety (25.0% vs. 17.6%). This difference is probably due to the very low threshold for "threshold depression," which requires only 1 or 2 symptoms with no duration or recurrence criteria. The frequency of threshold depression syndromes was nearly twice that of threshold anxiety syndromes (31.7% vs. 17.6%), whereas the frequencies of subthreshold anxiety and depression were approximately equal (25.0% vs. 25.3%). Most of the subjects who had either threshold or subthreshold anxiety also met criteria, at some point, for a depressive syndrome.

The prevalence of mixed anxiety and depression at the threshold level was 10.0% and that of mixed anxiety and depression at the subthreshold level was 8.1%. The latter category is not equivalent to "mixed anxiety-depression" as specified in the International Classification of Diseases (ICD-10) because concomitant expression of anxiety and depression was not required in the present study. When this condition is added to the criteria, the rate of "ad" is far lower than 8.1%.

Table 4. Depression and Anxiety Matrix by Diagnostic Level*

Depression	Threshold Anxiety	Subthreshold Anxiety	No Anxiety
D	AD	Da	D
d	dA	da	d
No depression	A	a	No diagnosis

*Abbreviations: D = threshold depression; d = subthreshold depression; A = threshold anxiety; a = subthreshold anxiety.

Table 5. Cumulative Longitudinal Threshold and Subthreshold Diagnosis Matrix*

Anxiety	D N	D %	d N	d %	No Depression N	No Depression %	Total N	Total %
A	59	10.0	32	5.4	13	2.2	104	17.6
a	68	11.5	48	8.1	32	5.4	148	25.0
No anxiety	60	10.2	70	11.8	209	35.4	339	57.4
Total	187	31.7	150	25.3	254	43.0	591	100.0

*Abbreviations: D = threshold depression; d = subthreshold depression; A = threshold anxiety; a = subthreshold anxiety.

Table 6. Weighted Cumulative Longitudinal Rates of Depression and Anxiety (%)*

Anxiety	D	d	None
A	5.9	3.2	2.9
a	7.4	4.6	4.0
None	8.3	13.4	50.3

*Abbreviations: D = threshold depression; d = subthreshold depression; A = threshold anxiety; a = subthreshold anxiety.

Table 7. Sex Ratio (Female:Male) of Threshold and Subthreshold Syndromes (Odds Ratios)*

Anxiety	D	d	None
A	1.8	0.9	1.6
a	2.4	1.5	1.1
None	1.1	0.9	0.6

*Abbreviations: D = threshold depression; d = subthreshold depression; A = threshold anxiety; a = subthreshold anxiety.

Table 8. Percentage of Patients Treated, by Diagnostic Level of Depression and Anxiety*

	Anxiety		
Depression	A	a	None
D	81%	53%	35%
d	78%	63%	39%
None	46%	28%	14%

*Abbreviations: D = threshold depression; d = subthreshold depression; A = threshold anxiety; a = subthreshold anxiety.

The weighted cumulative rates of the matrix of threshold and subthreshold anxiety and depression are shown in Table 6. The weighted rates correct for the over-sampling of high SCL-90 scores at study entry. These corrected rates reveal that approximately half of the sample met criteria for at least one threshold or subthreshold syndrome of anxiety or depression during the course of the study. In general, the rates of subthreshold-level syndromes were greater than those of threshold-level syndromes for both depression and anxiety. Rates of both threshold and subthreshold depression were greater than those of threshold and subthreshold anxiety. In general, comorbidity of anxiety and depression was more frequent than the pure forms of these two classes of disorder.

The sex ratio of the diagnostic matrix is shown in Table 7. The female to male sex ratio was far greater for comorbid anxiety and depression than for pure forms of these disorders, particularly at the threshold level of depression. With the exception of pure threshold anxiety, there was an approximately equal sex ratio for pure depression and pure anxiety. Finally, female subjects were nearly twice as likely to meet criteria for either threshold or subthreshold anxiety or depressive disorder than male subjects.

Table 8 shows the treatment rates by the cumulative diagnostic matrix. The results reveal that the majority of subjects who had either threshold or subthreshold disorders received treatment, ranging from 28% for subthreshold anxiety and 39% for subthreshold depression to 81% for threshold depression with anxiety. The rates of treatment were significantly greater among those who had comorbid disorders than among those who had pure threshold or subthreshold disorders. Indeed, comorbidity appeared to be more strongly related to treatment-seeking than to the threshold-subthreshold distinction.

The finding that 86% of subjects who had depression or anxiety at either the threshold or subthreshold levels reported a history of treatment provides evidence for the validity of including subthreshold-level categories in the classification of depression and anxiety disorders. Nearly one third of those subjects with a history of treatment would not have been classified if only threshold-level categories had been employed.

DISCUSSION

The results presented here underscore the importance of including subthreshold categories in the classification of depression and anxiety. Application of a broader classification of the spectra of anxiety and depression reveals that nearly half of young adults in the community report either anxiety or depression at least once during 15 years of observation. Inclusion of strictly threshold-level definitions would suggest that these syndromes are far more rare. Although the threshold cases of anxiety and depression, particularly those that co-occur, are typically more severe, treatment data suggest that inclusion of subthreshold categories provides far better coverage of treated cases than utilization of threshold-level definitions alone.

The application of subthreshold levels of all of the major components of depression also provides insight into the relevance of several subtypes of depression (minor depression, recurrent brief depression, and mixed anxiety-depression) that have been included, or were under consideration for inclusion, in the DSM-IV and the ICD-10. Although the research reviewed here does not assess the prevalence of each of these subtypes, the data suggest that these subthreshold categories are a very important source of morbidity, and they support the need for treatment in the community. For example, although the data presented here do not conform to the ICD-10 category for mixed anxiety-depression, they make clear the significance of the tendency toward co-occurrence of anxiety and depression at both the threshold and subthreshold levels across the longitudinal course.[14,15]

The data also provide some interesting insights into the sex ratio of depression, a subject that has been the source of numerous investigations over several decades. In the present study, the results suggest that the female predominance of depression in community studies may be largely attributable to the prevalence of more threshold-level manifestations and increased frequency of comorbidity of

depression and anxiety among female subjects. When pure cases are examined, there is an approximately equal sex ratio for both anxiety and depression. This result suggests that the application of subthreshold categories in community settings may enhance our understanding of the patterns of the expression of affective syndromes in male subjects who would otherwise have failed to meet criteria in previous studies that employed standard diagnostic criteria for depression.

The most important implication of these findings is their relevance to the classification of depression and anxiety in community and primary care settings. Ormel et al.[16] described the substantial proportion of patients in primary care who fail to meet standard diagnostic criteria for depression or anxiety syndromes, despite the observation that they appear to suffer from significant depressive or anxiety symptoms accompanied by a substantial degree of role impairment. Such people are likely to be missed by systematic screening based on diagnostic criteria. Likewise, the results of community studies reveal that there are a significant number of subjects who have sought psychiatric treatment but who fail to meet standard diagnostic criteria. These findings underscore the importance of generalizing diagnostic systems beyond the clinical settings in which most were developed. Although this step was one of the goals associated with the development of DSM-IV criteria, the breadth of these criteria across different settings has yet to be tested.[17]

In the present study, the addition of subthreshold categories improved the coverage of treated cases in the community by nearly a third, increasing from 61% identified according to threshold criteria to 89% classified with the inclusion of subthreshold categories. When examined separately for anxiety and depression, the subthreshold categories increased coverage by 57% among those subjects who reported treatment for anxiety and by 38% among those subjects who reported treatment for depression. Thus, the inclusion of subthreshold categories results in only about 10% of diagnoses among subjects who report a history of psychiatric treatment and who fail to meet either threshold or subthreshold diagnostic criteria.

Future work will examine each component of the specific subtypes of depression and anxiety in order to establish the validity of the criterial thresholds. However, the greatest support for the validity of the criteria is the longitudinal stability of the categories. Preliminary assessment of the longitudinal course of depression[18] reveals that there is little stability of the specific depressive subtypes among subjects who have repeated episodes over a 15-year period. Hence, application of the entire spectrum of depressive syndromes is necessary to identify subjects with depression or anxiety at a specific time.

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