Research Article

SUBTYPING SOCIAL ANXIETY DISORDER IN DEVELOPED AND DEVELOPING COUNTRIES

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Background: *Although social anxiety disorder (SAD) is classified in the fourth edition of* The Diagnostic and Statistical Manual *(DSM-IV) into generalized and non-generalized subtypes, community surveys in Western countries find no evidence of disjunctions in the dose–response relationship between number of social fears and outcomes to support this distinction. We aimed to determine whether this holds across a broader set of developed and developing countries, and whether subtyping according to number of performance versus interactional fears would be more useful.* **Methods:** *The World Health Organization's World Mental Health Survey Initiative undertook population epidemiological surveys in 11 developing and 9 developed countries, using the Composite International Diagnostic Interview to assess DSM-IV disorders. Fourteen performance and interactional fears were assessed. Associations between number of social fears in*

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SAD and numerous outcomes (age-of-onset, persistence, severity, comorbidity, treatment) were examined. Additional analyses examined associations with number of performance fears versus number of interactional fears. <u>Results</u>: *Lifetime social fears are quite common in both developed (15.9%) and developing (14.3%) countries, but lifetime SAD is much more common in the former (6.1%) than latter (2.1%) countries. Among those with SAD, persistence, severity, comorbidity, and treatment have dose–response relationships with number of social fears, with no clear nonlinearity in relationships that would support a distinction between generalized and non-generalized SAD. The distinction between performance fears and interactional fears is generally not important in predicting these same outcomes.* <u>Conclusion</u>: *No evidence is found to support subtyping SAD on the basis of either number of social fears or number of performance fears versus number of interactional fears. Depression and Anxiety 27:390–403, 2010.*   © *2009 Wiley-Liss, Inc.*

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Social anxiety disorder (SAD), or social phobia, is a prevalent condition associated with significant impairment and comorbidity in the United States,[1,2] Europe,[3] and developing countries.[4,5] Considerable interest exists in SAD spectrums and subtypes, with research addressing distinctions between SAD and such disorders as avoidant personality disorder and body dysmorphic disorder[6,7] and between generalized SAD and a more limited non-generalized subtype, where the latter is thought to be composed largely of performance fears.[8–10]

The fourth edition of *The Diagnostic and Statistical Manual* (DSM-IV) defines the generalized subtype of SAD as having fear of "most" social situations,[11] a distinction that may be useful in family and genetic studies insofar as generalized SAD is more familial than non-generalized SAD,[12] in neurobiological studies insofar as different physiological mechanisms characterize generalized and non-generalized SAD,[13,14] and in treatment studies insofar as there is differential treatment response by subtype.[15] Contributors to DSM-IV debated the possibility also of including a performance subtype of SAD, but made a decision not to do so.[9]

Community surveys have found little evidence for distinct SAD subtypes indicated by nonlinear associations

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between number of social fears and such correlates as disorder age-of-onset, persistence, severity, and comorbidity.[16–18] Instead, such surveys have found a dose–response relationship between number of social fears and these correlates, with no evidence of disjunctions in these associations.[2,19] Furthermore, although most recent pharmacological trials have been limited to generalized SAD, those that included a wider range of cases suggested that different SAD subtypes respond similarly to available treatments.[20,21] Such findings raise questions about the value of the generalized versus non-generalized distinction.

Based on this uncertainty, an argument could be made for extending existing analyses of SAD subtypes in three ways. First, most research on SAD subtypes has been undertaken in the United States and Europe, raising the question whether SAD subtypes are similar across the globe. Second, individuals with SAD who have few social fears might be inappropriately pathologized,[22,23] arguing for systematic comparison of generalized versus non-generalized SAD across a range of relevant validators. Third, it would be relevant to explore whether SAD subtypes distinguishing performance versus interactional fears would be more useful than those based on total number of fears.

This report address these three issues using data from the World Health Organization's (WHO) World Mental Health (WMH) Surveys[24] to compare patterns of onset, persistence, severity, comorbidity, and treatment among respondents with SAD as a function of number of overall social fears and number of performance versus interactional fears. The WMH database consists of representative community samples of over 100,000 adults from 20 countries that were assessed for a broad range of performance and interactional fears as well as DSM-IV SAD.

METHODS

SAMPLES

WMH surveys were carried out in Africa (Nigeria, South Africa), the Americas (Brazil, Colombia, Mexico, the United States), Asia and the Pacific (India, Japan, New Zealand, and separate surveys in Beijing, Shanghai, and Shenzhen in the People's Republic of China [PRC], described below as Metropolitan PRC), Europe (Belgium, Bulgaria, France, Germany, Italy, the Netherlands, Romania, Spain, Ukraine), and the Middle East (Lebanon).[24] Eleven of these countries are classified by the World Bank as less developed (Brazil, Bulgaria, China, Colombia, India, Lebanon, Mexico, Nigeria, Romania, South Africa, and Ukraine.[25] The others are developed. Country-level sample sizes range from 2,357 (Romania) to 12,790 (New Zealand). The total sample size is 103,810. The weighted average cross-national response rate was 74% with a 45.9% (France) to 98.6% (India) range (Table 1).

All surveys were based on multistage geographically clustered area probability household samples. Interviews were carried out face-to-face by trained lay interviewers. Sixteen surveys were based on nationally representative samples, two on nationally representative samples of urbanized areas (Colombia, Mexico), and the other two on regional samples (Brazil, PRC). Respondents had to be at least 18

years of age in most countries (20 in Japan). Colombia and Mexico were the only countries with an upper age limit (65). Detailed descriptions of WMH sampling procedures are presented elsewhere.[26]

Other than in Romania and South Africa, where all respondents were administered the full interview, internal subsampling was used to reduce respondent burden by dividing the interview into two parts. Part 1 assessed core disorders, including SAD, and was administered to all respondents. Part 2 included additional disorders and correlates, and was administered to all Part 1 respondents who met criteria for any lifetime Part 1 disorder plus a probability subsample of other respondents. Part 1 data were weighted to adjust for differential probabilities of selection and to match population distributions on census socio-demographic and geographic distributions. Part 2 data were additionally weighted for the undersampling of Part 1 respondents without core disorders.

DIAGNOSTIC ASSESSMENTS

SAD and other DSM-IV anxiety, mood, behavioral, and substance disorders were assessed using Version 3.0 of the WHO Composite International Diagnostic Interview (CIDI 3.0),[27] a fully structured lay-administered interview. The English version of the CIDI was translated into other languages using standardized WHO protocols.[28] Rigorous interviewer training and quality control monitoring were used to guarantee consistent administration.[29] Informed consent was obtained using procedures approved by local Institutional Review Boards.

Respondents were administered the full SAD section if they endorsed a diagnostic stem question for one or more performance or interactional fears described as excessive and causing substantial distress or avoidance. The SAD section assessed lifetime experiences of shyness, fear, and discomfort associated with each of 14 social situations. Respondents endorsing one or more such questions were asked about all DSM-IV criteria. Ages of first fear and avoidance were assessed to calculate SAD age-of-onset (AOO). Recency was also assessed, allowing calculation of time-to-recovery by comparing recency with AOO. CIDI diagnoses were compared to blinded clinical diagnoses using the Structured Clinical Interview for DSM-IV (SCID)[30] in probability subsamples of WMH respondents from France, Italy, Spain, and the United States. As detailed elsewhere, good CIDI–SCID diagnostic concordance was found for SAD and most other DSM-IV/CIDI disorders.[31]

OTHER MEASURES

Correlates of SAD considered here include comorbid DSM-IV/CIDI disorders, socio-demographics, childhood adversities, role impairments, suicidality, and treatment. Socio-demographics include age at interview, sex, education, marital status, employment status, and family income. Childhood adversities include over a dozen measures described in detail elsewhere.[32,33] Role impairments were assessed with the Sheehan Disability Scales (SDS)[34] focused on the one month in the past year when SAD was most severe. Respondents were also asked to estimate the number of days out of 365 in the past year when they were totally unable to work or carry out their other daily activities because of SAD. Lifetime history and AOO of suicidal ideation, plans, and attempts were assessed in a special CIDI suicidality section.[35] Lifetime and 12-month treatment of emotional problems of any sort (i.e. not necessarily SAD) were assessed in five sectors: general medical, psychiatry, non-psychiatry mental health specialty, human services, and complementary-alternative (CAM).[36] Disorder-specific outpatient and inpatient treatment was also assessed (other than in South Africa), but without information about treatment sectors.

TABLE 1. WMH sample characteristics in developed countries and developing countries

Country	Survey[a]	Sample characteristics[b,c]	Field dates	Age range	Sample size			Response rate[e]
					Part I	Part II	Part II and age ≤44[d]	
I. Developed								
Belgium	ESEMeD	Stratified multistage clustered probability sample of individuals residing in households from the national register of Belgium residents. NR	2001–2002	18+	2,419	1,043	486	50.6
France	ESEMeD	Stratified multistage clustered sample of working telephone numbers merged with a reverse directory (for listed numbers). Initial recruitment was by telephone, with supplemental in-person recruitment in households with listed numbers. NR	2001–2002	18+	2,894	1,436	727	45.9
Germany	ESEMeD	Stratified multistage clustered probability sample of individuals from community resident registries. NR	2002–2003	18+	3,555	1,323	621	57.8
Italy	ESEMeD	Stratified multistage clustered probability sample of individuals from municipality resident registries. NR	2001–2002	18+	4,712	1,779	853	71.3
Japan	WMHJ2002–2006	Unclustered two-stage probability sample of individuals residing in households in nine metropolitan areas (Fukiage, Higashi-ichiki, Ichiki, Kushikino, Nagasaki, Okayama, Sano, Tamano, Tendo, and Tochigi)	2002–2006	20+	3,417	1,305	425	59.2
Netherlands	ESEMeD	Stratified multistage clustered probability sample of individuals residing in households that are listed in municipal postal registries. NR	2002–2003	18+	2,372	1,094	516	56.4
New Zealand[f]	NZMHS	Stratified multistage clustered area probability sample of household residents. NR	2004–2005	18+	12,790	7,435	–	73.3
Spain	ESEMeD	Stratified multistage clustered area probability sample of household residents. NR	2001–2002	18+	5,473	2,121	960	78.6
United States	NCS-R	Stratified multistage clustered area probability sample of household residents. NR	2002–20033	18+	9,282	5,692	3,197	70.9
II. Developing								
Brazil	São Paulo Megacity	Stratified multistage clustered area probability sample of household residents in the São Paulo metropolitan area	2004–2007	18+	5,037	2,942	–	81.3
Bulgaria	NSHS	Stratified multistage clustered area probability sample of household residents. NR	2003–2007	18+	5,318	2,233	741	72.0
Colombia	NSMH	Stratified multistage clustered area probability sample of household residents in all urban areas of the country (approximately 73% of the total national population)	2003	18–65	4,426	2,381	1,731	87.7
India	WMHI	Stratified multistage clustered area probability sample of household residents in Pondicherry region. NR	2003–2005	18+	2,992	1,373	642	98.6

TABLE 1. Continued

Country	Survey[a]	Sample characteristics[b,c]	Field dates	Age range	Sample size			Response rate[e]
					Part I	Part II	Part II and age ≤44[d]	
Lebanon	LEBANON	Stratified multistage clustered area probability sample of household residents. NR	2002–2003	18+	2,857	1,031	595	70.0
Mexico	M-NCS	Stratified multistage clustered area probability sample of household residents in all urban areas of the country (approximately 75% of the total national population)	2001–2002	18–65	5,782	2,362	1,736	76.6
Nigeria	NSMHW	Stratified multistage clustered area probability sample of households in 21 of the 36 states in the country, representing 57% of the national population. The surveys were conducted in Yoruba, Igbo, Hausa, and Efik languages	2002–2003	18+	6,752	2,143	1,203	79.3
PRC	B-WMH S-WMH	Stratified multistage clustered area probability sample of household residents in the Beijing and Shanghai metropolitan areas	2002–2003	18+	5,201	1,628	570	74.7
PRC	Shenzhen	Stratified multistage clustered area probability sample of household residents and temporary residents in the Shenzhen area	2006–2007	18+	7,134	2,476	1,993	80.0
Romania	RMHS	Stratified multistage clustered area probability sample of household residents. NR	2005–2006	18+	2,357	–	–	70.9
South Africa	SASH	Stratified multistage clustered area probability sample of household residents. NR	2003–2004	18+	4,315	–	–	87.1
Ukraine	CMDPSD	Stratified multistage clustered area probability sample of household residents. NR	2002	18+	4,725	1,720	541	78.3

[a]ESEMeD, The European Study of the Epidemiology of Mental Disorders; WMHJ2002-2006, World Mental Health Japan Survey; NCS-R, The US National Comorbidity Survey Replication; NZMHS, New Zealand Mental Health Survey; NSHS, Bulgaria National Survey of Health and Stress; NSMH, The Colombian National Study of Mental Health; WMHI, World Mental Health India; LEBANON, Lebanese Evaluation of the Burden of Ailments and Needs of the Nation; M-NCS, The Mexico National Comorbidity Survey; NSMHW, The Nigerian Survey of Mental Health and Wellbeing; B-WMH, The Beijing World Mental Health Survey; S-WMH, The Shanghai World Mental Health Survey; RMHS, Romania Mental Health Survey; SASH, South Africa Stress and Health Study; CMDPSD, Comorbid Mental Disorders during Periods of Social Disruption.

[b]Most WMH surveys are based on stratified multistage clustered area probability household samples in which samples of areas equivalent to counties or municipalities in the United States were selected in the first stage followed by one or more subsequent stages of geographic sampling (e.g. towns within counties, blocks within towns, households within blocks) to arrive at a sample of households, in each of which a listing of household members was created and one or two people were selected from this listing to be interviewed. No substitution was allowed when the originally sampled household resident could not be interviewed. These household samples were selected from census area data in all countries other than France (where telephone directories were used to select households) and The Netherlands (where postal registries were used to select households). Several WMH surveys (Belgium, Germany, Italy) used municipal resident registries to select respondents without listing households. The Japanese sample is the only totally unclustered sample, with households randomly selected in each of the four sample areas and one random respondent selected in each sample household. Sixteen of the 20 surveys are based on nationally representative (NR) household samples and two others are based on nationally representative household samples in urbanized areas (Colombia, Mexico).

[c]The response rate is calculated as the ratio of the number of households in which an interview was completed to the number of households originally sampled, excluding from the denominator households known not to be eligible, either because of being vacant at the time of initial contact or because the residents were unable to speak the designated languages of the survey.

[d]Brazil, Israel, New Zealand, Romania, and South Africa did not have an age restricted Part II sample. All other countries, with the exception of India, Nigeria, People's Republic of China, and Ukraine (which were age restricted to ≤39) were age restricted to ≤44.

[e]The weighted average response rate is 74%.

[f]The New Zealand survey includes respondents as young as 16 years of age, but only those 18+ are considered in this report to maintain consistency with the other surveys. The sample size reported here is for respondents ages 18+. The full sample including those 16–17 was 12,992. The reported response rate is based on the total sample, as there is no way to compute a response rate only for those 18+.

STATISTICAL ANALYSIS

Cross-tabulations were used to estimate prevalence. The actuarial method[37] was used to estimate AOO curves and time-to-recovery curves. Exploratory factor analysis, based on a matrix of tetrachoric correlations, was used to examine the structure of social fears in SAD. Socio-demographic associations were estimated using logistic regression. Associations of number of social fears with SAD-specific role impairments were evaluated using logistic regression controlling for comorbid DSM-IV/CIDI disorders and socio-demographics. Associations of number of social fears in SAD with comorbid disorders and suicidality were estimated using discrete time-survival models in which secondary disorders were treated as time-varying outcomes. In both the logistic and survival models, we evaluated predictive effects of individual fears (i.e. a separate dummy predictor variable for each reported type of social fear), total number of social fears, and separate numbers of performance and interactional fears. In models that examined number of fears, we examined the functional form of associations to determine if nonlinearities might provide a principled basis for defining a threshold between generalized and non-generalized SAD. We also tested for significant differences in the predictive effects of number of performance versus number of interactional fears to justify distinguishing between the two. Both logistic regression coefficients and survival coefficients were exponentiated for ease of interpretation to create odds-ratios (ORs). Associations of number of social fears with treatment were estimated using cross-tabulations. Significance tests were estimated using the Taylor series linearization method[38] implemented in the SUDAAN[39] software system to adjust for the weighting and clustering of WMH data. Multivariate significance was evaluated using Wald χ^2 tests based on design-corrected coefficient variance–covariance matrices. Statistical significance was consistently evaluated using two-tailed .05-level tests.

RESULTS

PREVALENCE AND SOCIO-DEMOGRAPHIC CORRELATES

Lifetime social fears are common in both developed (15.9%) and developing (14.3%) countries, although virtually every fear is significantly more common in developed countries (Table 2). Relative prevalence across social fears is similar in the two sets of countries, with fears of speaking in a meeting or class and public speaking most common and fears of using a bathroom away from home and writing, eating, or drinking while being watched are least common. The main exceptions to similarity of ranking are lower relative prevalence of fears of going to parties and dating situations in developing countries, a pattern presumably reflecting cross-national differences in frequency of parties and dating.

The estimated lifetime prevalence of DSM-IV SAD is much higher in developed (6.1%) than developing (2.1%) countries. This difference is much greater proportionally than the differences in prevalence of social fears. This means the developed versus developing difference in SAD prevalence is due more to significantly higher risks of SAD given particular social fears than to differences in prevalence of fears (Table 3). The dose–response relationship between number of social fears and probability of SAD is also consistently

higher in developed than developing countries, with the range of probabilities being 8.8–76.6% in developed countries versus 3.2–49.0% in developing countries.

Logistic regression models examined associations of social fear type and number with meeting full criteria for lifetime SAD among respondents with one or more lifetime social fears. (Detailed results are not reported, but are available on request.) Significant variation was found in odds of SAD associated with both types and number of fears in developed ($\chi^2_{13} = 103.3$, $P<.001$ for type; $\chi^2_{13} = 74.5$, $P<.001$ for number) and developing ($\chi^2_{13} = 31.5$, $P=.003$ for type; $\chi^2_{13} = 84.5$, $P<.001$ for number) countries. The distinction between number of performance fears versus number of interactional fears was not significant in either developed or developing countries ($\chi^2_1 = 0.3–0.6$, $P=.46–.48$).

Additional logistic models examined socio-demographic predictors of number of social fears among respondents with lifetime SAD. (Detailed results are not shown, but are available on request.) Significant predictors in developed countries included being female, young, unmarried, low in education, low in income, and unemployed. Similar coefficients were found in developing countries, but were statistically significant only for education and income. These associations were similar throughout the range of the outcome variable (i.e. in predicting more than one social fear among those with one or more, more than two social fears among those with two or more, more than "s" social fears among those with "s" or more, etc.) rather than displaying any sharp change in pattern above or below a given number of social fears.

THE STRUCTURE OF SOCIAL FEARS

Exploratory factor analysis of the 14×14 tetrachoric correlation matrix of social fears among respondents with lifetime SAD found unrotated eigenvalues that suggested the existence of either two or three meaningful factors in both developed (5.9, 1.6, 1.1, and 0.9) and developing (5.8, 1.7, 1.2, and 0.9) countries. Promax rotation in two dimensions found a first factor with high loadings in both sets of countries (0.54–0.87; 0.64–0.79) on most specific fears involving both performance and interaction, other than those involving performance fears of speaking in small groups (e.g. a meeting or class), speaking in large groups (e.g. public speaking or performance), having an important examination or interview, and working while being watched (Table 4). The first two of the latter four fears had very high loadings on a second factor (0.84–0.92; 0.88–0.89), whereas the third had lower loadings on the second factor (0.54; 0.59) and the fourth had cross-loadings on both factors (0.56–0.28; 0.41–0.41). The correlation between factors was 0.35 in developed countries and 0.38 in developing countries.

The three-factor solution found more clear differentiation between performance and interactional fears. The fears with high loadings on the first factor in both sets of

TABLE 2. Lifetime prevalence of social fears and social anxiety disorder (SAD) in developed and developing countries[a]

	Prevalence of each fear in the total sample				Prevalence of lifetime SAD among respondents with each fear				Prevalence of lifetime SAD involving each fear in the total sample[b]				Prevalence of each fear among respondents with lifetime SAD			
	Developed		Developing		Developed (SAD)		Developing (SO)		Developed (SAD)		Developing (SO)		Developed (SAD)		Developing (SO)	
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Meeting new people	8.8*	(0.2)	5.0	(0.1)	51.9*	(1.1)	23.9	(1.1)	4.6*	(0.1)	1.2	(0.1)	74.8*	(1.0)	57.6	(2.0)
Talking to people in authority	8.6*	(0.2)	6.6	(0.1)	49.6*	(1.0)	20.6	(0.9)	4.3*	(0.1)	1.4	(0.1)	70.1	(1.0)	66.5	(1.7)
Speaking up in meeting/class	12.5*	(0.2)	9.0	(0.2)	41.5*	(0.8)	17.8	(0.7)	5.2*	(0.1)	1.6	(0.1)	84.9*	(0.8)	78.2	(1.6)
Going to parties	6.9*	(0.2)	2.9	(0.1)	56.3*	(1.1)	30.2	(1.5)	3.9*	(0.1)	0.9	(0.0)	64.0*	(1.1)	42.5	(1.7)
Public speaking/performance	13.0*	(0.2)	9.4	(0.2)	40.7*	(0.8)	16.9	(0.7)	5.3*	(0.1)	1.6	(0.1)	86.8*	(0.7)	77.4	(1.6)
Important exam/interview	8.9*	(0.2)	6.3	(0.1)	46.1*	(1.0)	20.0	(1.0)	4.1*	(0.1)	1.3	(0.1)	67.3*	(1.0)	61.0	(2.2)
Working while being watched	6.6*	(0.2)	4.4	(0.1)	52.4*	(1.2)	24.0	(1.2)	3.5*	(0.1)	1.1	(0.1)	56.9*	(1.1)	51.4	(2.0)
Entering an occupied room	6.7*	(0.2)	4.3	(0.1)	55.4*	(1.1)	25.6	(1.2)	3.7*	(0.1)	1.1	(0.1)	61.0*	(1.1)	53.6	(1.8)
Talking with strangers	6.9*	(0.2)	4.2	(0.1)	54.6*	(1.1)	26.1	(1.2)	3.8*	(0.1)	1.1	(0.1)	61.7*	(1.1)	52.7	(1.8)
Expressing disagreement	6.8*	(0.2)	3.9	(0.1)	50.5*	(1.1)	26.2	(1.2)	3.4*	(0.1)	1.0	(0.1)	56.5*	(1.0)	49.6	(1.8)
Writing/eating/drinking while being watched	4.4*	(0.1)	3.6	(0.1)	57.0*	(1.3)	25.0	(1.2)	2.5*	(0.1)	0.9	(0.1)	41.5	(1.2)	44.4	(1.8)
Using public bathroom	3.1	(0.1)	3.2	(0.1)	49.7*	(1.7)	23.3	(1.3)	1.5*	(0.1)	0.7	(0.0)	25.0*	(1.0)	36.1	(1.8)
Dating situation	5.4*	(0.2)	3.2	(0.1)	57.3*	(1.3)	28.0	(1.4)	3.1*	(0.1)	0.9	(0.1)	50.6*	(1.2)	43.7	(1.9)
Other performance or interactional fear	8.9*	(0.2)	6.0	(0.1)	50.0*	(1.0)	23.0	(1.0)	4.5*	(0.1)	1.4	(0.1)	73.4*	(1.1)	67.0	(1.7)
Any of the above fears	15.9*	(0.3)	14.3	(0.2)	38.3*	(0.7)	14.4	(0.5)	6.1*	(0.1)	2.1	(0.1)	100.0	(0.0)	100.0	(0.0)

*Significant difference between developed and developing countries at the .05 level, two-sided test.

[a]The total sample size is 46,914 respondents in developed countries and 56,896 in developing countries.

[b]The percentages in this column equal the product of the percentages in the preceding two columns. For example, 4.6% of respondents in the developing world sample have a lifetime history of SAD involving a fear of meeting new people.

TABLE 3. Number of lifetime social fears in relation to social anxiety disorder (SAD) in developed and developing countries[a]

| | Prevalence of each number of fears in the total sample | | | | Prevalence of lifetime SAD among respondents with each number of fears | | | | Prevalence of lifetime SAD involving each number of fears in the total sample | | | | Prevalence of each number of fears among respondents with lifetime SAD | | | |
| | Developed | | Developing | | Developed | | Developing | | Developed | | Developing | | Developed | | Developing | |
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE
Exactly 1 fear	0.9*	(0.1)	2.0	(0.1)	8.8*	(1.6)	3.2	(0.6)	0.1	(0.0)	0.1	(0.0)	1.3*	(0.3)	3.1	(0.6)
Exactly 2 fears	1.5*	(0.1)	2.2	(0.1)	13.3*	(1.5)	4.4	(0.7)	0.2	(0.0)	0.1	(0.0)	3.4	(0.4)	4.7	(0.8)
Exactly 3 fears	1.5*	(0.1)	2.0	(0.1)	13.1*	(1.4)	7.3	(0.9)	0.2	(0.0)	0.1	(0.0)	3.3*	(0.4)	7.1	(0.9)
Exactly 4 fears	1.4	(0.1)	1.6	(0.1)	25.2*	(2.1)	7.7	(1.1)	0.4*	(0.0)	0.1	(0.0)	5.8	(0.5)	6.1	(0.9)
Exactly 5 fears	1.3	(0.1)	1.3	(0.1)	29.5*	(2.2)	11.6	(1.4)	0.4*	(0.0)	0.1	(0.0)	6.1	(0.5)	7.3	(0.9)
Exactly 6 fears	1.2	(0.1)	1.0	(0.1)	36.8*	(2.4)	17.1	(1.9)	0.4*	(0.0)	0.2	(0.0)	7.4	(0.6)	8.5	(1.0)
Exactly 7 fears	1.2	(0.1)	0.9	(0.1)	39.1*	(2.4)	26.5	(2.7)	0.5*	(0.0)	0.2	(0.0)	8.0*	(0.6)	11.5	(1.2)
Exactly 8 fears	1.3*	(0.1)	0.8	(0.1)	48.1*	(2.4)	23.7	(2.6)	0.6*	(0.0)	0.2	(0.0)	10.0	(0.6)	9.0	(1.1)
Exactly 9 fears	1.1*	(0.1)	0.6	(0.0)	46.2*	(2.5)	27.6	(2.8)	0.5*	(0.0)	0.2	(0.0)	8.3	(0.5)	8.6	(1.0)
Exactly 10 fears	1.2*	(0.1)	0.5	(0.0)	51.5*	(2.4)	31.5	(3.4)	0.6*	(0.0)	0.2	(0.0)	10.2	(0.6)	8.3	(1.0)
Exactly 11 fears	1.0*	(0.1)	0.5	(0.0)	64.8*	(2.6)	30.6	(3.9)	0.6*	(0.0)	0.1	(0.0)	10.5*	(0.7)	6.9	(1.0)
Exactly 12 fears	0.9*	(0.0)	0.4	(0.0)	65.3*	(2.9)	37.3	(4.6)	0.6*	(0.0)	0.1	(0.0)	9.8*	(0.6)	6.8	(0.9)
Exactly 13 fears	0.8*	(0.0)	0.3	(0.0)	75.7*	(2.4)	44.4	(4.9)	0.6*	(0.0)	0.1	(0.0)	9.9*	(0.6)	5.8	(0.8)
Exactly 14 fears	0.5*	(0.0)	0.3	(0.0)	76.6*	(3.8)	49.0	(4.5)	0.4*	(0.0)	0.1	(0.0)	6.0	(0.5)	6.5	(0.7)

*Significant difference between developed and developing countries at the .05 level, two-sided test.
[a]The results are based on the 7,498 respondents with one or more lifetime social fears in developed countries and 7,777 in developing countries.

countries all involved social interactions: meeting new people, going to parties, entering an occupied room, talking with strangers, expressing disagreement, and dating (0.47–0.88; 0.44–0.90). The fears with high loadings on the second factor in both sets of countries all involved performance: working, writing, eating, or drinking while being watched, and using public bathrooms (0.54–0.85; 0.68–0.77). The fears with high loadings on the third factor in both sets of countries involved a more specific set of performance fears involving speaking either in small or large groups (0.80–0.93; 0.83–0.88). The other three fears (of talking to people in authority, having an important exam or interview, or other unspecified performance or interactional fears) had inconsistent loadings across the two sets of countries. The correlation between Factors I (interactional fears) and II (performance fears other than those of speaking) was much higher in both sets of countries (0.51–0.48) than the correlation between I and III (0.23–0.29) or II and III (0.28–0.27), indicating consistency with the results of the two-factor solution that speaking fears are more distinct than other performance fears from interactional fears.

AGE-OF-ONSET AND PERSISTENCE

Cumulative SAD AOO distributions were estimated separately for respondents with 1–4, 5–7, 8–10, and 11–14 social fears in developed and developing countries. (Detailed results are not reported, but are available on request.) Mean AOO was inversely related to number of social fears, from lows of ages 11.3–13.5 years in developed–developing countries among respondents with 11–14 social fears to highs of 16.0–15.0 years among respondents with 1–4 social fears. Cumulative distributions of time to recovery also varied significantly with number of social fears. (Detailed results are not reported, but are available on request.) The most persistent course is associated with large number of fears in both developed ($\chi^2_3 = 16.5$, $P < .001$) and developing ($\chi^2_3 = 10.6$, $P = .010$) countries. Roughly linear relationships were found between number of social fears, and both mean AOO and mean persistence. No sharp inflection point in the association was found that might be used to justify a distinction between generalized and nongeneralized SAD.

CHILDHOOD ADVERSITIES

Respondents with lifetime SAD were asked if they had any close relatives with SAD. A positive association was found between number of social fears and these reports in both developed (statistically significant) and developing (insignificant trend) countries. (Detailed results are not reported, but are available on request.) However, these associations were not specific. Part II respondents were asked about parental history of major depression, generalized anxiety disorder, substance abuse, and antisocial personality disorder. Number of social fears among respondents with SAD was related

TABLE 4. Factor loadings (standardized regression coefficients) of social fears in a two-factor promax rotated principal factors analysis of the tetrachoric correlations between pairs of social fears among respondents with DSM-IV/CIDI social anxiety disorder (SAD) separately in developed and developing countries

	Two-factor solution[a]				Three-factor solution[b]					
	Developed		Developing		Developed			Developing		
	I	II	I	II	I	II	III	I	II	III
Meeting new people	0.87	−0.05	0.79	−0.05	0.88	0.03	−0.01	0.89	−0.05	−0.04
Talking to people in authority	0.44	0.33	0.27	0.50	0.11	0.56	0.16	0.50	−0.16	0.50
Speaking up in a meeting or class	0.03	0.84	−0.16	0.89	0.08	0.12	0.80	0.08	−0.17	0.88
Going to parties	0.83	−0.16	0.71	0.10	0.85	−0.02	−0.11	0.62	0.20	0.07
Public speaking/performance	−0.19	0.92	−0.06	0.88	−0.01	−0.06	0.93	−0.08	0.16	0.83
Important exam/interview	0.26	0.54	0.14	0.59	−0.17	0.72	0.30	−0.11	0.42	0.52
Working while being watched	0.56	0.28	0.43	0.41	0.02	0.85	0.02	−0.03	0.68	0.30
Entering an occupied room	0.79	0.04	0.70	0.14	0.62	0.29	−0.02	0.58	0.24	0.10
Talking with strangers	0.80	0.02	0.87	−0.10	0.82	0.03	0.05	0.90	0.05	−0.11
Expressing disagreement	0.64	0.16	0.66	0.10	0.47	0.30	0.09	0.68	0.06	0.09
Writing/eating/drinking while being watched	0.65	0.10	0.67	0.11	0.31	0.54	−0.05	0.17	0.71	0.01
Using public bathroom	0.54	−0.08	0.67	−0.16	0.12	0.61	−0.26	0.08	0.77	−0.26
Dating situation	0.67	0.00	0.69	0.02	0.60	0.13	−0.01	0.44	0.39	−0.03
Any other performance or interactional fear	0.44	0.24	0.47	0.19	0.64	−0.19	0.33	0.08	0.57	0.11
(n)	(2,954)		(1,147)		(2,954)			(1,147)		

[a]Correlation between factors: 0.35 in developed countries; 0.38 in developing countries.
[b]Correlations among factors: 0.51 I–II, 0.23 I–III, 0.28 II–III in developed countries: 0.48 I–II, 0.29 I–III, 0.27 II–III in developing countries.

to reporting all these parental disorders in both developed (statistically significant) and developing (insignificant trend) countries. (Detailed results are not reported, but are available on request.) As with other correlates, no nonlinearity along the distribution of number of social fears was found. Roughly half the other measures of childhood adversity assessed in the WMH surveys (including physical abuse, sexual abuse, and parental violence) were also significantly related to number of social fears among respondents with SAD. Similar patterns were found in both developed and developing countries. As with the other correlates, these associations were roughly linear.

ROLE IMPAIRMENT

Significant associations were found between number of social fears and 12-month role impairments on all the SDS dimensions (Table 5). Importantly, these patterns hold even after controlling for other DSM-IV/CIDI disorders. More detailed analyses showed that these impairments vary as a function of types of social fears. (Detailed results are not reported, but are available on request.) Number of fears was also significantly related to some types of role impairments even after controlling for types of fears, but with no evidence of meaningful nonlinearities that would help differentiate generalized from non-generalized subtypes. The distinction between number of performance fears and number of interactional fears was for the most part not significant in predicting role impairments.

COMORBIDITY AND SUICIDALITY

A positive association was found between number of social fears in SAD and odds of comorbidity with other DSM-IV/CIDI disorders among people in both developed and developing countries. (Detailed results are not presented, but are available on request.) No nonlinearity was found in these data that would justify making a distinction between generalized and non-generalized SAD. Suicidality among respondents with SAD, in comparison, was generally not associated with number of social fears, the exception being lifetime suicidal ideation among respondents with SAD in developing countries, where the OR with high (10–14) versus low (1–4) number of social fears was a statistically significant 2.2.

TREATMENT

We considered seven measures of lifetime treatment. No significant relationship was found between number of social fears, and any of these seven in developing countries and four of the seven in developed countries (Table 6). The three exceptions are associations with human services and CAM treatment of any emotional problem and inpatient treatment of SAD in developed countries. In all three cases, the significance was due entirely to respondents with 11+ fears being more likely to receive treatment than those with 1–10 fears.

We considered six measures of 12-month treatment, four of which were significantly related to number of social fears in developed countries and one in developing countries. In all these cases, the associations

TABLE 5. The associations of 12-month role impairments based on the Sheehan Disability Scales (SDS) with number of social fears among respondents with 12-month DSM-IV/CIDI social anxiety disorder (SAD) separately in developed and developing countries[a]

	Twelve-month SAD with …																	
	1–4 fears				5–7 fears				8–10 fears				11–14 fears				χ^2_3	
	Developed		Developing		Developed		Developing		Developed		Developing		Developed		Developing		Developed	Developing
Domain[b]	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE	Est	SE		
Home, % severe	6.0	(1.8)	7.0	(2.2)	5.0	(1.4)	8.9	(2.3)	8.1	(1.4)	7.2	(1.8)	13.1	(1.5)	18.7	(3.5)	19.6*	15.1*
Work, % severe	10.1	(2.1)	11.2	(2.9)	11.4	(1.8)	7.4	(2.1)	12.4	(1.8)	18.8	(3.9)	19.7	(1.6)	23.2	(4.3)	19.4*	10.5*
Relationships, % severe	11.8	(2.6)	12.7	(3.5)	19.9	(2.5)	18.8	(3.6)	25.9	(2.3)	28.5	(4.0)	37.9	(2.2)	35.1	(3.8)	53.7*	10.9*
Social, % severe	6.5	(1.8)	13.4	(3.7)	15.6	(2.2)	17.5	(3.2)	21.1	(2.1)	27.4	(3.8)	28.7	(2.1)	32.5	(3.7)	43.1*	13.5*
Any domain, % severe	23.0	(3.3)	21.3	(4.2)	29.6	(2.9)	28.4	(3.9)	34.4	(2.3)	43.9	(4.3)	42.6	(2.3)	45.8	(4.4)	30.3*	12.0*
Days out of role, mean	8.1	(3.7)	2.1	(0.9)	6.5	(1.5)	7.6	(3.9)	12.2	(2.3)	8.4	(2.5)	23.7	(3.2)	29.0	(7.5)	25.9*	14.2*
(n)	(188)		(149)		(337)		(195)		(493)		(193)		(676)		(235)			

*Significant association between number of social fears and impairment at the .05 level, two-sided test separately within either developed or developing countries. We also tested for differences in severity between developed and developing countries within subsamples defined by number of social fears, but none of these 24 comparisons (six indicators of impairment in each of four subsamples defined by number of social fears) was significant at the .05 level using two-sided tests.

[a]Significance tests are based on multivariate regression equations that controlled for age, sex, and all the other comorbid DSM-IV/CIDI disorders assessed in the surveys.

[b]The SDS scales focused on impairments in role functioning due to SAD in the one month during the year before interview when these impairments were most severe. Respondents were asked to use a 0–10 scale (with 0 representing no impairment, 1–3 mild impairment, 4–6 moderate impairment, 7–9 severe impairment, and 10 very severe impairment) to rate the level of impairment due to SAD in each of four role domains: household maintenance (home), work performance (work), personal relationships (relationships), and social life (social). Results reported here focus on the percent of cases that reported severe or very severe impairments in one or more of the four SDS domains. The *any domain* score represents the percent of cases that reported severe or very severe impairments. The "days out of" role measure asked respondents to estimate the number of days out of 365 in the past year when they were totally unable to work or carry out their other usual daily activities because of their SAD.

TABLE 6. Lifetime and 12-month treatment of emotional problems generally and social anxiety disorder (SAD) specifically as a function of number of social fears among respondents with SAD separately in developed and developing countries

	Lifetime (Part I) or 12-month (Part II) SAD with …																χ^2_3	
	1–4 fears				5–7 fears				8–10 fears				11–14 fears					
	Developed		Developing		Developed		Developing		Developed		Developing		Developed		Developing		Developed	Developing
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE		
I. Lifetime treatment																		
A. Overall treatment[a]																		
MHS	37.4	(3.2)	28.3	(4.9)	43.1	(2.9)	27.7	(3.6)	46.9	(2.1)	30.8	(3.7)	46.3	(2.0)	33.9	(4.1)	5.8	0.4
GM	39.6	(3.6)	17.6	(3.4)	41.8	(2.7)	21.1	(3.6)	43.6	(2.1)	18.3	(3.2)	50.5	(2.0)	20.2	(3.2)	5.3	0.0
HS	10.4	(2.3)	6.2	(2.0)	9.7	(1.3)	8.2	(2.0)	10.5	(1.2)	6.4	(2.0)	17.1	(1.5)	8.9	(2.5)	10.0*	0.7
CAM	11.3	(2.0)	11.2	(2.7)	14.7	(1.6)	8.2	(2.2)	19.4	(1.6)	5.3	(1.8)	23.9	(1.6)	6.9	(2.0)	13.1*	5.4
Any	61.7	(3.6)	46.4	(5.0)	63.1	(2.7)	43.1	(4.2)	65.5	(2.1)	46.1	(4.1)	69.6	(1.8)	45.3	(4.4)	1.4	1.8
B. Disorder-specific treatment[b]	31.5	(3.0)	28.1	(5.8)	33.9	(2.4)	17.5	(3.1)	35.4	(2.0)	24.9	(4.1)	37.0	(1.7)	19.7	(3.2)	2.6	3.2
Inpatient	2.3	(0.9)	0.4	(0.3)	2.7	(0.6)	1.8	(0.8)	2.6	(0.7)	0.3	(0.3)	4.2	(0.7)	1.6	(0.9)	9.2*	4.1
Outpatient																		
(*n*)	(401)		(239)		(616)		(299)		(841)		(286)		(1,096)		(323)			
II. Twelve-month treatment																		
A. Overall treatment[a]																		
MHS	15.2	(3.1)	8.6	(2.8)	16.0	(2.5)	11.7	(3.0)	22.8	(2.5)	12.4	(3.6)	23.1	(1.7)	17.8	(3.7)	8.1*	3.5
GM	22.0	(3.5)	11.8	(3.2)	21.9	(2.6)	16.1	(3.8)	26.6	(2.6)	15.2	(4.2)	30.5	(1.9)	13.2	(3.0)	8.1*	0.8
HS	4.7	(2.1)	0.8	(0.8)	3.5	(0.9)	3.2	(1.6)	5.1	(1.2)	4.5	(2.2)	9.5	(1.3)	7.3	(2.7)	9.0*	4.8
CAM	3.4	(1.4)	5.9	(2.3)	5.8	(1.1)	4.8	(2.2)	6.4	(1.5)	1.4	(0.8)	9.6	(1.3)	1.0	(0.5)	3.7	8.3*
Any	33.2	(4.2)	20.9	(4.3)	34.7	(3.2)	25.3	(4.3)	40.1	(2.8)	26.9	(4.8)	45.5	(2.3)	31.0	(4.5)	8.9*	2.6
B. Disorder-specific treatment[b]	13.1	(2.9)	5.7	(2.5)	14.5	(2.4)	4.9	(2.0)	17.7	(2.1)	14.2	(4.7)	17.5	(1.5)	13.1	(3.5)	3.2	3.8
(*n*)	(188)		(149)		(337)		(195)		(493)		(193)		(676)		(235)			

*Significant association between number of social fears and impairment at the .05 level, two-sided test.

[a]Treatment for any emotional problem, not necessarily SAD; MHS, Mental Health Specialty treatment, including outpatient treatment by a psychiatrist or other mental health professional or inpatient treatment; GM, General Medical treatment; HS, human Services treatment; CAM, Complementary-Alternative Medical treatment; Any, Any of the four above types of treatment.

[b]Outpatient treatment includes treatment in any sector (i.e. MHS, GM, HS, and/or CAM). Inpatient and outpatient treatment were combined in the 12-month data because of the low proportions of cases who received 12-month inpatient treatment. Disorder-specific treatment was not assessed in South Africa, resulting in a reduction in sample sizes for developing countries as following; For lifetime treatment: 1–4 fears (*n* = 217), 5–7 (*n* = 259), 8–10 (*n* = 258), 11–14 (*n* = 297). For 12-month fears, 1–4 (*n* = 131), 5–7 (*n* = 167), 8–10 (*n* = 171), 11–14 (*n* = 216).

involve treatment of any emotional problem rather than treatment specifically focused on SAD: mental health specialty, general medical, human services, and any outpatient treatment in developed countries and CAM treatment in developing countries. The associations involving specialty and general medical treatment were due to higher treatment among respondents with 8+ than 1–7 social fears, and the association involving human services treatment was due to higher treatment among respondents with 11+ than 1–10 fears. The association involving CAM in developing countries was due to lower treatment among respondents with 8+ than 1–7 social fears. These inconsistent patterns provide no principled basis for distinguishing between generalized and non-generalized SAD.

DISCUSSION

Several significant limitations should be emphasized. First, although clinical reappraisal interviews found CIDI diagnoses to be conservative relative to SCID diagnoses,[31] clinical validation of the CIDI was undertaken only in a few developed countries. Second, respondents were administered the full CIDI assessment of SAD only if they reported at least one social fear that was either excessive or associated with substantial avoidance or distress. This screening approach might have resulted in excluding some of the milder cases of SAD, leading to a truncation of the SAD severity distribution. Third, we did not include assessments of social fears that might be more common in specific countries, such as fear of eye contact in Japan, presumably resulting in more under-estimation of prevalence in some countries than others. Fourth, information about AOO, lifetime symptoms, and lifetime treatment were based on retrospective reports that might have been biased. A number of strategies were used to reduce recall errors in the WMH surveys,[27] but these are unlikely to have removed recall bias completely.

Despite these limitations, the WMH data expand on earlier epidemiological surveys of social phobia in a number of important ways, including the broad geographic coverage, the more comprehensive assessment of impairments associated with SAD than previous surveys, and the assessment of both performance and interactional fears. Regarding this last feature, we failed to find factor analysis evidence for a single distinct factor associated with performance fears, but rather found that the distinction between speaking fears and other social fears was more salient than the distinction between overall performance fears and interactional fears.

Consistent with the earlier literature, we found that SAD is a commonly occurring and significantly impairing condition that typically has an early age-of-onset and is often associated with substantial comorbidity (including suicidality). We also found that the considerably lower prevalence of SAD in developing than developed countries is due much more to lower conditional probability of SAD given social fears than to lower prevalence of social fears. This finding warrants detailed analysis that goes beyond the scope of this report.

The main focus of this report was on finding a principled basis for distinguishing generalized from non-generalized SAD by documenting nonlinearities in the relationship between number of social fears and various correlates. No such evidence was found despite a clear dose–response pattern being found between number of social fears and AOO, persistence, impairments, and comorbidity. This failure is consistent with the results of several other epidemiological surveys in developed countries.[2,17,19] We also investigated the implications of distinguishing between performance and interactional social fears and found that this distinction, like that between generalized and non-generalized SAD, was generally not significant.

Failure to document nonlinearities of the sort we searched for does not argue definitively against the value of distinguishing between generalized and non-generalized SAD. This distinction might be important in other ways, such as in predicting treatment response, although the existing treatment literature provides some limited evidence that similar interventions are effective for both generalized and non-generalized SAD.[21] It can also sometimes be useful in making a categorical distinction on a dimensional scale merely to define a level of severity that indicates special concern, as in the distinction between a hurricane and a tropical storm (which is made purely on the basis of wind speed). The concept of generalized SAD might consequently be considered useful insofar as cases with a larger number of fears are likely to be more severe, making it useful to include such cases in genetic studies or in pharmacotherapy trials.[12,40,41] It is important to recognize, though, that subtyping on the basis of a composite measure, which includes information about types of social fears in addition to information about number of social fears, would do an even better job of distinguishing more and less severe cases. And, of course, it would also be possible to assess severity directly if there was an interest in distinguishing between more and less severe cases, calling into question the value of distinguishing generalized and non-generalized SAD. As the gradients in persistence, severity, and comorbidity associated with increasing numbers of social fears are relatively continuous, a dimensional approach to the consideration of number of social fears more closely reflects clinical reality than a categorical approach.

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