Published in final edited form as:

Am J Psychiatry. 2015 July ; 172(7): 647–656. doi:10.1176/appi.ajp.2015.14091185.

Pediatric-Onset and Adult-Onset Separation Anxiety Disorder Across Countries in the World Mental Health Survey

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Abstract

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All other authors report no financial relationships with commercial interests.

Objective—The age-at-onset criterion for separation anxiety disorder was removed in DSM-5, making it timely to examine the epidemiology of separation anxiety disorder as a disorder with onsets spanning the life course, using cross-country data.

Method—The sample included 38,993 adults in 18 countries in the World Health Organization (WHO) World Mental Health Surveys. The WHO Composite International Diagnostic Interview was used to assess a range of DSM-IV disorders that included an expanded definition of separation anxiety disorder allowing onsets in adulthood. Analyses focused on prevalence, age at onset, comorbidity, predictors of onset and persistence, and separation anxiety-related role impairment.

Results—Lifetime separation anxiety disorder prevalence averaged 4.8% across countries (interquartile range [25th–75th percentiles]=1.4%–6.4%), with 43.1% of lifetime onsets occurring after age 18. Significant time-lagged associations were found between earlier separation anxiety disorder and subsequent onset of internalizing and externalizing DSM-IV disorders and conversely between these disorders and subsequent onset of separation anxiety disorder. Other consistently significant predictors of lifetime separation anxiety disorder included female gender, retrospectively reported childhood adversities, and lifetime traumatic events. These predictors were largely comparable for separation anxiety disorder onsets in childhood, adolescence, and adulthood and across country income groups. Twelve-month separation anxiety disorder prevalence was considerably lower than lifetime prevalence (1.0% of the total sample; interquartile range=0.2%–1.2%). Severe separation anxiety-related 12-month role impairment was significantly more common in the presence (42.4%) than absence (18.3%) of 12-month comorbidity.

Conclusions—Separation anxiety disorder is a common and highly comorbid disorder that can have onset across the lifespan. Childhood adversity and lifetime trauma are important antecedents, and adverse effects on role function make it a significant target for treatment.

Although separation anxiety disorder traditionally has been a diagnosis assigned to children and adolescents, DSM-5 removed the 18-year age-at-onset restriction on diagnosis because studies had found later onset to be common. It is timely therefore to examine key aspects of the epidemiology of separation anxiety disorder as a condition with onsets that span the life course.

The importance of adult-onset separation anxiety disorder is indicated by the fact that 20%–40% of adult patients with mood and anxiety disorders have been found to have symptoms of the disorder, and between one-third and one-half of these patients reported onsets after 18 years of age (1–3). Patients with adult separation anxiety disorder experience high levels of functional impairment and show a poor response to conventional treatments used for other anxiety subtypes (4).

There is a dearth of epidemiologic data focusing on separation anxiety disorder across the lifespan. A longitudinal study commencing in childhood recorded a 5% lifetime prevalence of separation anxiety disorder by the time the cohort reached early adulthood (5). The National Comorbidity Survey Replication in the United States found a lifetime separation anxiety disorder prevalence of 6.6% after the pediatric age-at-onset requirement was removed, with two-thirds of case subjects having onsets after 17 years of age (6), but comparable data in other samples or populations have yet to be reported.

The relationship of separation anxiety disorder with other mental disorders also remains to be clarified. A longstanding theory has posited a specific developmental relationship between childhood-onset separation anxiety disorder and adult panic disorder and/or agoraphobia (7, 8), an association supported by findings from twin and laboratory studies (9, 10). Yet a meta-analysis of community studies has indicated that separation anxiety disorder may represent a generic risk factor for a range of anxiety disorders and other forms of psychopathology in adulthood (11) rather than primarily for panic disorder and/or agoraphobia.

Consistent with the principles of attachment theory (12), a recent developmental model has suggested that separation anxiety symptoms may mediate the associations between early family adversity and trauma and subsequent onset of common adult mental disorders (13). Family dysfunction and exposure to major disasters appear to be associated with subsequent onset of separation anxiety in childhood (13–15). Overall, however, data are limited concerning associations involving early adversity, exposure to trauma, onset of separation anxiety disorder, and a range of later psychopathologic outcomes.

In the present study, we analyzed data from the cross-national World Health Organization (WHO) World Mental Health surveys (16) to assess the following key aspects of separation anxiety disorder in the general population: 1) lifetime and 12-month prevalence overall and by gender and country income grouping; 2) the proportions of case subjects experiencing childhood and adult onsets; 3) patterns of comorbidity and temporal relationships with onset and persistence of other common DSM-IV disorders; 4) associations of other predictors (sociodemographic variables, childhood adversities, lifetime traumatic events) with separation anxiety disorder onset and persistence; and 5) severity of role impairment associated with 12-month separation anxiety disorder.

METHOD

Samples

Separation anxiety disorder was assessed in 18 World Mental Health surveys: nine in high-income countries (Belgium, France, Germany, Italy, the Netherlands, Northern Ireland, Portugal, Spain, and the United States), five in upper-middle income countries (Brazil, Bulgaria, Lebanon, Mexico, and Romania), and four in low-/lower-middle income countries (Colombia, Nigeria, the People's Republic of China, and Peru). A total of 38,993 respondents were assessed. All surveys used probability sampling based on multistage area clustered household survey designs with no substitution for nonparticipants. The majority of surveys were based on nationally representative samples, the remainder on samples representative of particular urban areas (Sao Paulo in Brazil, Beijing and Shanghai in the People's Republic of China), all nonrural areas in the country (Colombia, Mexico), or major regions of the country (Nigeria). Response rates ranged from 45.9% to 90.2% and averaged 70.3%. More details on the World Mental Health Survey sampling are presented elsewhere (17).

The World Mental Health Survey interview was administered in two parts to reduce respondent burden. All respondents completed part I, which assessed core disorders. All

respondents with a part I disorder plus a probability subsample of other part I respondents were administered part II, which assessed additional disorders and correlates. The part I data were weighted for differential probabilities of selection and to match population distributions on socio-demographic and geographic variables. The part II data were additionally weighted to adjust for differential probabilities of selection from part I into part II. Separation anxiety disorder was typically assessed in part II but in some countries was included in part I. In one-half of the surveys, the assessment of separation anxiety disorder was restricted to respondents in the age range 18–39 or 18–44, while in the other surveys, there was no such age restriction.

Measures

Overview—World Mental Health Survey interviews were conducted face-to-face by lay interviewers. Consistent translation, back-translation, and harmonization procedures were used in adapting the interview for local administration (18). Consistent interviewer training and field quality-control procedures were applied across sites (19). All respondents provided informed consent according to the requirements of local institutional review boards before being interviewed.

Diagnostic assessment—The diagnostic interview was the WHO Composite International Diagnostic Interview (CIDI) (20), a fully-structured interview that assessed lifetime and 12-month prevalence of DSM-IV mood (major depressive disorder and/or dysthymia, bipolar disorder), anxiety (panic disorder and/or agoraphobia, specific phobia, social phobia, generalized anxiety disorder, posttraumatic stress disorder [PTSD]), and externalizing (intermittent explosive disorder, alcohol and drug abuse with or without dependence) disorders. A special probing strategy shown to yield improved age-at-onset reports of individual disorders was used (21). A blinded clinical reappraisal study using the Structured Clinical Interview for DSM-IV (SCID) (22) as the gold standard found good diagnostic concordance between core CIDI and SCID diagnoses, although the module for separation anxiety disorder was not included (23). The CIDI module for separation anxiety disorder departed from DSM-IV in assessing lifetime onset of symptoms not only as of age 18 but also for onsets that occurred at ages 19 or later (6). A separation anxiety disorder diagnosis required endorsement of at least three of the eight criterion A DSM-IV symptoms, having symptoms for at least 1 month, and experiencing associated clinically significant distress or role impairment.

Sociodemographic variables—Sociodemographic variables considered here include age at interview (18–34, 35–49, 50–64, and 65 years), gender, education (student, and among nonstudents, low, low-average, average-high, and high-level of education based on country-specific distributions), and marital status.

Functional Impairment—A modified version of the Sheehan Disability Scales (24) was used to assess severity of role impairment associated with separation anxiety disorder in the previous year. Respondents were asked to quantify severity of role impairment in home management, work, social life, and personal relationships using a 0–10 self-anchoring scale with the following response categories: none (0), mild (1–3), moderate (4–6), severe (7–9),

and very severe (10). Respondents rated the Sheehan Disability Scales for the month in the previous year when separation anxiety disorder was most severe. Scores for the Sheehan Disability Scales were dichotomized into severe (range 7–10 for any domain of the scales) or not severe (scores lower than 7–10 for all domains).

Childhood family adversities—World Mental Health Survey respondents were asked retrospectively about exposure to a wide range of childhood family adversities. As reported previously (25), exploratory factor analysis of responses found one factor for experiences indicative of childhood maladaptive family functioning (parental mental illness, substance misuse, criminal behavior, domestic violence, and child physical abuse, sexual abuse, and neglect), while other childhood adversities were combined into a second scale that included parental death, parental divorce, other long separations from a parent, serious illness of a close family member, and family economic adversity.

Traumatic events—The CIDI assessed 29 lifetime traumatic events aggregated into the seven domains of accidents and natural disasters, war events, intimate and sexual violence, death of a loved one, other interpersonal violence, network events, and other traumas participants decided not to disclose (26). Dichotomous measures were created for one or more events in each of these domains.

Analysis Procedures

Cross-tabulations were used to estimate lifetime and 12-month separation anxiety disorder prevalence separately for men and women in each survey. Age-at-onset reports were analyzed using the two-part actuarial method to estimate survival curves (27). The proportion of lifetime cases with onsets after age 18 was calculated for each country and country income group. Discrete-time survival analysis with person-year as the unit of analysis and a logistic link function (28) was used to examine cross-lagged associations of temporally primary separation anxiety disorder with subsequent first onset of other disorders and reciprocal associations of other temporally primary disorders with subsequent first onset of separation anxiety disorder. Survival coefficients and standard errors were exponentiated to generate odds-ratios with 95% confidence intervals.

The same survival analysis approach was used to estimate associations of sociodemographic variables, childhood adversities, and lifetime traumatic events (28) with first onset of separation anxiety disorder and to examine variation in strength of prediction as a function of age at onset (childhood [up through age 12], adolescence [ages 13–17], early adulthood [ages 18–29] and later onsets [ages 30]). The associations of the same predictors with persistence of separation anxiety disorder, defined as 12-month prevalence among lifetime cases, were examined using person-level logistic regression analysis controlling for age at onset and time since onset. Finally, cross-tabulations were used to examine joint associations of country income level, separation anxiety disorder age at onset, and 12-month comorbidities with 12-month severe separation anxiety-related role impairments. Relative fit of additive and interactive models was evaluated using the Akaike information criterion and Bayesian information criterion (29).

Standard errors of estimates were based on the Taylor series linearization method implemented with SUDAAN software (30, 31) to adjust for the weighting and geographic clustering of World Mental Health data. Multivariate significance tests were carried out with Wald chi-square tests based on Taylor series coefficient variance-covariance matrices. Statistical significance was evaluated using 0.05-level two-sided tests.

RESULTS

Prevalence

Lifetime prevalence of the expanded CIDI definition of DSM-IV separation anxiety disorder that allowed adult onsets was 4.8% in the total sample but with a much wider interquartile range (25th–75th percentiles: 1.4–6.4) and range (0.2%–9.8%) across countries than previously found for most other DSM-IV/CIDI disorders (32) (Table 1). Lifetime prevalence was higher among women than men in 15 of the 18 countries and significantly so in the total sample (5.6% compared with 4.0%; $\chi^2=4.0$, $df=1$, $p<0.05$). Twelve-month prevalence was considerably lower than lifetime prevalence (1.0% in the total sample; interquartile range: 0.2%–1.2%; range: 0.0%–2.7%), higher among women than men in 14 of 18 countries and significantly higher among women than men in the total sample (1.3% compared with 0.8%; $\chi^2=12.0$, $df=1$, $p<0.001$).

Age at Onset

The age-at-onset distribution of separation anxiety disorder was quite similar across the three country income groups (Figure 1). Median age at onset was in the late teens in high- and upper-middle income countries and in the mid-20s in low-/lower-middle income countries. The interquartile range of the age-at-onset distribution was wider (15–35 years of age in low-/lower-middle income countries; 9–35 in high- and upper-middle income countries) than previously found for most other DSM-IV/CIDI disorders (32). A total of 43.1% of respondents with lifetime separation anxiety disorder had onsets in adulthood (ages 18+). The proportion of lifetime cases with adult onsets was significantly higher in low-/lower-middle income countries (53.8%) than in upper-middle income countries (39.1%; $\chi^2=98.0$, $df=1$, $p<0.001$) or high- income countries (41.6%; $\chi^2=52.8$, $df=1$, $p<0.001$). Although there were only two low/low-middle income countries with sizable numbers of lifetime separation anxiety disorder cases ($N=359$ in Colombia; $N=154$ in Peru), the proportion of these cases with adult onsets was comparable in the two surveys (55.7% compared with 51.8%; $\chi^2=1.5$, $df=1$, $p=0.22$).

Persistence

Comparison of individual-level age at onset and recency reports showed that the majority of people with lifetime separation anxiety disorder remitted within a decade of onset (Figure 2). However, the recovery curves became much less steep after approximately 10 years. As with age at onset, the distribution of time to remission was quite consistent across country income groups. This relatively rapid remission of separation anxiety disorder is consistent with the low 12-month/lifetime prevalence ratio shown in Table 2.

Comorbidity

Lifetime separation anxiety disorder was significantly comorbid with 13 of the other 14 DSM-IV/CIDI disorders assessed in the World Mental Health surveys, the exception being substance dependence with abuse. Survival analysis pooled across countries showed that these associations were a result of 1) significant associations between temporally primary separation anxiety disorder and subsequent first onset of 10 other disorders (odds ratios in the range of 1.3–2.8) coupled with 2) significant associations of nine other disorders with subsequent first onset of separation anxiety disorder (odds ratios in the range of 1.3–2.1) (Table 2). The vast majority of cross-lagged odds ratio pairs between separation anxiety disorder and other disorders were reciprocal in significance and comparable in magnitude. The major exceptions were that temporally primary separation anxiety disorder was a significantly stronger predictor of subsequent attention deficit hyperactivity disorder (ADHD) (odds ratio=2.8) than ADHD was of subsequent separation anxiety disorder (odds ratio=1.1) and that there were no significant associations between temporally primary PTSD, generalized anxiety disorder, or agoraphobia and subsequent-onset separation anxiety disorder in contrast to the reciprocal relationships. Disaggregation by country income group (results available upon request from Silove) showed considerable consistency in these patterns, with the vast majority of significant odds ratios in the total sample also significant in at least two of the three country income groups.

The associations of other temporally primary disorders with subsequent separation anxiety disorder persistence (i.e., 12-month prevalence among lifetime cases controlling for age at onset and time since onset) were not significant. The same was generally true for the associations of temporally primary separation anxiety disorder with subsequent persistence of other disorders, with the exceptions being that temporally primary separation anxiety disorder was a predictor of persistence of agoraphobia (odds ratio=2.6), and to a lesser extent, PTSD. As with the analyses of first onset, disaggregation by country income group (results available upon request from Silove) showed consistency in the nonsignificance of these reciprocal associations between lifetime comorbidity and persistence.

Other Predictors of Separation Anxiety Disorder Onset and Persistence

Controlling for lifetime comorbid DSM-IV/CIDI disorders, age, and country, survival analysis showed that lifetime separation anxiety disorder was significantly associated with being female (odds ratio=1.1–1.4), having low through high-average (compared with high) education (odds ratio=1.5–1.7), maladaptive family functioning childhood adversities (odds ratio=1.7–2.8), other childhood adversities (odds ratio=1.2–1.8), and a variety of lifetime traumatic events (odds ratio=1.3–1.6) (Table 3). It is noteworthy that the associations involving maladaptive family functioning childhood adversities and other lifetime traumatic events predicted not only pediatric-onset but also adult-onset separation anxiety disorder, while other childhood adversities predicted only childhood-onset separation anxiety disorder.

Disaggregation by country income group (detailed results available upon request from Silove) showed considerable consistency in these patterns, with the vast majority of significant odds ratios in the total sample also significant in at least two of the three country

income groups. As with the analysis of comorbidity, the predictors considered here were not significantly related to separation anxiety disorder persistence either in the total sample or in country income groups (detailed results available upon request from Silove). For example, the associations of maladaptive family functioning childhood adversities with separation anxiety disorder persistence were nonsignificant both in the total sample ($\chi^2=2.5$, $df=5$, $p=0.78$) and in each of the three country income groups ($\chi^2=2.9-10.2$, $df=5$, $p=0.07-0.72$). In addition, we found that age at onset (defined in categories of childhood <13 years old, adolescence 13–17 years old, young adulthood 18–29 years old, and later adulthood 30 years old) was not significantly related to persistence either in the total sample ($\chi^2=4.3$, $df=3$, $p=0.23$) or in any of the three country income groups ($\chi^2=3.0-5.4$, $df=3$, $p=0.15-0.39$).

Role Impairment of 12-Month Separation Anxiety Disorder

More than one-third (35.3%) of respondents with 12-month separation anxiety disorder reported severe separation anxiety-related role impairment in the year before interview (Table 4). The rate of severe role impairment was considerably lower in low-/lower-middle income countries (17.6%) than upper-middle or high-income countries (38.2%–41.4%; $\chi^2=12.6-18.1$, $df=1$, $p<0.001$) and considerably higher in the presence than absence of 12-month comorbid DSM-IV/CIDI disorders (42.4% compared with 18.3%; $\chi^2=21.6$, $df=1$, $p<0.001$). Separation anxiety-related role impairment did not differ markedly as a function of separation anxiety disorder age at onset ($\chi^2=2.9$, $df=3$, $p=0.40$). A model that assumed additive effects of country income level, comorbidity, and age at onset predicted severe separation anxiety-related role impairment with no evidence of significant interaction between the factors.

DISCUSSION

The findings concerning the prevalence of separation anxiety disorder across countries are summarized in Figure 3. The 4.8% overall lifetime prevalence estimate found in this study suggests that separation anxiety disorder is a relatively common lifetime disorder, although with a much wider range of prevalence across countries (0.2%–9.8%; interquartile range: 1.4–6.4) than found for most other DSM-IV/CIDI disorders assessed in the World Mental Health Surveys (32). Temporally prior separation anxiety disorder was found to be associated with significantly elevated odds of subsequent first onset of a wide range of other disorders, including not only internalizing disorders (major depression, bipolar disorder, specific and social phobias, panic disorder, and/or generalized anxiety disorder) but also externalizing disorders (ADHD, oppositional defiant disorder, and conduct disorder). This finding is consistent with a recent meta-analysis concluding that separation anxiety disorder represents a generic risk factor for a range of common mental disorders (11). Importantly, therefore, our data do not support the hypothesis of an exclusive link between separation anxiety disorder and panic disorder and/or agoraphobia (7, 8), although the existence of a significant association between temporally primary separation anxiety disorder and subsequent persistence of agoraphobia has potential prognostic importance in relation to the latter disorder.

We also found reciprocal associations of a similarly wide range of temporally primary disorders with the subsequent onset of separation anxiety disorder, a result that is broadly consistent with the suggestion that these comorbidities are due to common causes more than to direct effects of particular early-onset disorders on particular later-onset disorders (33). Indeed, an earlier World Mental Health Survey analysis found that separation anxiety disorder had a high factor loading on the internalizing factor of a two-dimensional model and that controls for summary internalizing-externalizing dimensions accounted for the significant cross-lagged associations of separation anxiety disorder with most comorbid disorders (34). Questions therefore remain whether separation anxiety disorder has any specificity as a risk factor for onset of particular secondary disorders either in childhood or adulthood (13).

Maladaptive family functioning childhood adversities and exposure to traumatic life events were found to be associated with separation anxiety disorder onset but not persistence, both in the total sample and, separately, in low-/lower-middle, upper-middle, and high-income countries. Importantly, these associations were found for separation anxiety disorder onsets across the entire life course. It is possible that more in-depth future analyses will find significant specifications in the associations of particular types of childhood adversities or traumatic events at specific life course stages with subsequent separation anxiety disorder onset. Nevertheless, in such analyses, it will be important to account for more general associations that may exist involving a wide range of childhood adversities and traumatic events as a backdrop against which more specific specifications are considered. The mechanisms responsible for the ongoing liability to separation anxiety disorder and other mental disorders arising from early adversity and trauma, including the possible neurobiological mediators of these effects, are the focus of ongoing inquiry (35, 36).

Our findings suggest that separation anxiety disorder is more likely to be seriously impairing in higher-income than low-/lower-middle income countries. The explanation of this specification is unclear, although it is possible that a culture of individuality and independence in higher-income countries results in low personal and social tolerance of separation anxiety, whereas a collectivist culture in low-/lower-middle income countries accepts a degree of separation anxiety as normative or even adaptive. A related unanswered question is why the range of prevalence across countries is so large.

Limitations of the study include variation in response rates across countries, use of a fully-structured diagnostic interview that did not allow clinical probing to confirm diagnoses, and a cross-sectional design in which lifetime prevalence, childhood adversities, and lifetime traumatic events were assessed retrospectively. Although we used the DSM-IV 1-month duration requirement rather than the DSM-5 6-month recommended (although not mandated) duration criterion for adults in defining separation anxiety disorder, overestimation of prevalence in relation to the latter diagnostic system is likely to be slight given that the median persistence of disorder was 4–8 years. Recall bias is a more serious concern, since this might have led to an underestimation of lifetime prevalence among remitted cases and an overestimation of persistence, even though the World Mental Health Surveys used special probing strategies designed to improve recall accuracy (21) and in some countries limited duration of recall by assessing separation anxiety disorder only

among respondents younger than ages 40–45. If biases exist, however, this means that separation anxiety disorder is an even more prevalent lifetime disorder with an even lower persistence than suggested by the present results. Retrospectively reported age at onset was unrelated to 12-month persistence among lifetime cases, suggesting that there was no tendency for respondents to overstate onset of separation anxiety disorder in adulthood. The high prevalence of adult-onset cases therefore supports the decision to remove the separation anxiety disorder age-at-onset restriction in DSM-5. An issue worthy of further investigation is that the ratio of 12-month/lifetime separation anxiety disorder prevalence is much lower than that of most other World Mental Health disorders (1.0% 12-month prevalence; range: 0.0%–2.7%; interquartile range: 0.2%–1.2%).

Our findings have important implications for clinical practice. The results challenge the long-established view that separation anxiety disorder should be reserved for diagnosis among children and adolescents by indicating that adult onset is prevalent across countries and that adult-onset separation anxiety disorder is equally persistent and impairing as the pediatric-onset form of this disorder. Clinicians should be alerted to the need to consider separation anxiety disorder in the differential diagnosis of patients of all ages presenting not only with anxiety but with a wide variety of internalizing and externalizing disorders. As yet, existing psychological and pharmacological treatments used for the other anxiety disorders have proven to be ineffective for adult separation anxiety disorder (4, 37). There is consequently an urgent need to devise and test novel treatments for this disorder, particularly as it manifests in adulthood.

Acknowledgments

The World Health Organization (WHO) World Mental Health Survey Initiative is supported by NIMH (R01 MH070884, R13 MH066849, and R01 MH069864), the National Institute on Drug Abuse (R01 DA016558), the John D. and Catherine T. MacArthur Foundation, the Pfizer Foundation, the Fogarty International Center (FIRCA R03-TW006481), the Pan American Health Organization, Eli Lilly, Ortho-McNeil Pharmaceutical, GlaxoSmithKline, and Bristol-Myers Squibb. None of these funders had any role in the design, analysis, interpretation of results, or preparation of this article. (A complete list of World Mental Health publications is available online [<http://www.hcp.med.harvard.edu/wmh/>].) The 2007 Australian National Survey of Mental Health and Wellbeing was funded by the Australian Government Department of Health and Ageing. The São Paulo Megacity Mental Health Survey is supported by the State of São Paulo Research Foundation Thematic Project (grant 03/00204-3). The Bulgarian Epidemiological Study of common mental disorders is supported by the Ministry of Health and the National Center for Public Health Protection. The Colombian National Study of Mental Health is supported by the Ministry of Social Protection. The ESEMeD project is funded by the European Commission (contracts QL65-1999-01042, SANCO 2004123, and EABC 20081308), the Piedmont Region (Italy), Fondo de Investigación Sanitaria, Instituto de Salud Carlos III, Spain (FIS 00/0028), Ministerio de Ciencia y Tecnología, Spain (SAF 2000-158-CE), Departament de Salut, Generalitat de Catalunya, Spain, Instituto de Salud Carlos III (CIBER CB06/02/0046, RETICS RD06/0011 REM-TAP), and other local agencies and by an unrestricted educational grant from GlaxoSmithKline. The Lebanese National Mental Health Survey (L.E.B.A.N.O.N.) is supported by the Lebanese Ministry of Public Health, WHO (Lebanon), National Institutes of Health/Fogarty International Center (R03 TW006481-01), Sheikh Hamdan Bin Rashid Al Maktoum Award for Medical Sciences, anonymous private donations to IDRAAC, Lebanon, and research grants from AstraZeneca, Eli Lilly, GlaxoSmithKline, Lundbeck, Novartis, Roche, and Servier. The Nigerian Survey of Mental Health and Wellbeing is supported by WHO (Geneva), WHO (Nigeria), and the Federal Ministry of Health, Abuja, Nigeria. The Northern Ireland Study of Mental Health was funded by the Health and Social Care Research and Development Division of the Public Health Agency. The Chinese World Mental Health Survey Initiative is supported by the Pfizer Foundation. The Portuguese Mental Health Study was carried out by the Department of Mental Health, Faculty of Medical Sciences, NOVA University of Lisbon, with collaboration of the Portuguese Catholic University, and was funded by the Champalimaud Foundation, the Gulbenkian Foundation, the Foundation for Science and Technology and Ministry of Health. The Romania World Mental Health study projects “Policies in Mental Health Area” and “National Study regarding Mental Health and Services Use” were carried out by the National School of Public Health and Health Services Management (former National Institute for Research and Development in

Health, present National School of Public Health Management and Professional Development, Bucharest), with technical support from Metro Media Transylvania, the National Institute of Statistics-National Centre for Training in Statistics, SC, Cheyenne Services SRL, Statistics Netherlands and were funded by the Ministry of Public Health (former Ministry of Health), with supplemental support from Eli Lilly Romania SRL. The U.S. National Comorbidity Survey Replication is supported by NIMH (U01-MH60220), with supplemental support from the National Institute of Drug Abuse, the Substance Abuse and Mental Health Services Administration, the Robert Wood Johnson Foundation (grant 044708), and the John W. Alden Trust. The de-identified survey data are stored and were analyzed on secure servers at the World Mental Health Data Analysis Coordination Center at Harvard Medical School, Boston.

The authors thank Herbert Matschinger for contributions to the World Mental Health Surveys.

Dr. Silove receives royalties from Little, Brown Book Group and Oxford University Press; and he has served as a consultant for Counterpart International. Dr. Demyttenaere serves on the speaker's bureaus and/or advisory panels of AstraZeneca, Eli Lilly, Johnson and Johnson, Lundbeck, Neurex, Servier, Shire, and Takeda and has also received research grants from Eli Lilly and Fonds voor Wetenschappelijk onderzoek Vlaanderen. Dr. Fiestas is an employee of the Peruvian National Institutes of Health. Dr. Kessler has served as a consultant for Hoffmann-La Roche and Johnson and Johnson Wellness and Prevention; he has also served on advisory boards for Johnson and Johnson Services Lake Nona Life Project, the Mensante Corporation, and U.S. Preventive Medicine; and he is a shareholder with DataStat.

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FIGURE 1.

Age at Onset for Respondents With Separation Anxiety Disorder by Country Income

FIGURE 2.
Speed of Recovery From Separation Anxiety Disorder by Country Income

FIGURE 3.

Lifetime and 12-Month Prevalence of Separation Anxiety Disorder

^a Significant difference between males and females for lifetime prevalence ($\chi^2=32.0$, $p<0.001$) and 12-month prevalence ($\chi^2=8.8$, $p=0.003$).

TABLE 1
Lifetime and 12-Month Prevalence of Separation Anxiety Disorder Stratified by Gender and Country Income

Country and Country Income	Lifetime Prevalence						12-Month Prevalence						Sample Size (N)	
	Total		Male		Female		Total		Male		Female			
	%	SE	%	SE	%	SE	%	SE	%	SE	%	SE	Male	Female
All countries	4.8	0.1	4.0	0.2	5.6*	0.2	1.0	0.1	0.8	0.1	1.3*	0.1	16,869	22,124
Low-/lower-middle income	5.5	0.4	4.5	0.4	6.4*	0.5	1.3	0.2	0.9	0.2	1.7	0.4	2,622	3,472
Colombia	9.8	0.8	8.1	1.1	11.3*	1.2	2.7	0.5	1.9	0.5	3.3	0.9	885	1,496
Nigeria	0.2	0.1	0.2	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	614	675
People's Republic of China-Beijing/Shanghai	1.3	0.5	0.7	0.4	2.1	1.0	0.2	0.1	0.0	0.0	0.4	0.2	326	297
Peru	6.1	0.7	5.6	0.8	6.6	0.9	1.2	0.2	0.9	0.2	1.4	0.3	797	1,004
Upper-middle income	4.7	0.2	4.0	0.3	5.3*	0.3	1.2	0.1	1.0	0.2	1.4	0.2	5,334	7,271
Brazil	7.7	0.4	6.7	0.6	8.6*	0.6	2.0	0.3	1.7	0.4	2.3	0.3	2,187	2,850
Bulgaria	1.4	0.4	1.5	0.8	1.2	0.3	0.4	0.3	0.6	0.5	0.2	0.1	951	1,282
Lebanon	6.9	1.3	4.9	1.5	9.0	1.8	1.9	0.5	1.1	0.5	2.7	0.8	251	365
Mexico	4.5	0.4	3.7	0.8	5.2	0.5	0.9	0.2	0.7	0.2	1.1	0.2	853	1,509
Romania	0.9	0.3	0.9	0.4	0.9	0.3	0.3	0.1	0.2	0.1	0.3	0.2	1,092	1,265
High-income	4.7	0.2	3.7	0.2	5.6*	0.3	0.9	0.1	0.7	0.1	1.0	0.1	8,913	11,381
Belgium	1.4	0.3	0.7	0.3	2.1*	0.4	0.1	0.1	0.0	0.0	0.3	0.2	599	591
France	3.5	0.5	3.1	0.7	3.9	1.0	0.9	0.3	0.4	0.2	1.4	0.7	692	772
Germany	2.0	0.4	1.5	0.4	2.6	0.6	0.4	0.2	0.5	0.3	0.4	0.3	806	912
Italy	1.5	0.4	0.6	0.3	2.3*	0.5	0.0	0.0	0.0	0.0	0.1	0.1	1,171	1,209
The Netherlands	3.0	0.6	2.0	0.8	4.0	1.1	0.6	0.3	0.5	0.3	0.7	0.6	472	637
Northern Ireland	5.1	0.5	5.1	0.8	5.2	0.6	0.4	0.1	0.5	0.2	0.4	0.1	822	1,164
Portugal	6.4	0.8	5.7	1.5	7.2	0.7	1.2	0.3	0.8	0.4	1.5	0.4	759	1,301
Spain	1.2	0.3	1.1	0.4	1.4	0.4	0.3	0.1	0.1	0.1	0.4	0.2	1,210	1,485
United States	9.2	0.4	7.4	0.5	10.8*	0.6	1.9	0.2	1.7	0.3	2.1	0.2	2,382	3,310

* p < 0.05 (two-sided test).

TABLE 2

Time-Lagged Associations (Odds Ratios) of Temporally Primary Composite International Diagnostic Interview (CIDI) Separation Anxiety Disorder With the Subsequent Onset and Persistence of Other DSM-IV/CIDI Disorders and of Temporally Primary Other Disorders With the Subsequent Onset and Persistence of Separation Anxiety Disorder

Disorder	Temporally Primary Separation Anxiety Disorder Predicting Subsequent Onset and Persistence of Other Disorders			Temporally Primary Other Disorders Predicting Subsequent Onset and Persistence of Separation Anxiety Disorder		
	Onset ^d	Persistence ^b		Onset ^c	Persistence ^d	
	Odds Ratio	95% CI	Odds Ratio	95% CI	Odds Ratio	95% CI
Internalizing						
Major depressive disorder	1.4 [*]	1.3–1.6	1.3 [*]	1.1–1.7	1.7 [*]	1.4–2.0
Bipolar disorder	1.8 [*]	1.4–2.3	1.3	0.8–2.2	1.9 [*]	1.4–2.4
Panic disorder without agoraphobia	1.3 [*]	1.0–1.7	1.0	0.6–1.8	1.8 [*]	1.4–2.2
Generalized anxiety disorder	1.5 [*]	1.2–1.9	1.4	1.0–1.9	1.1	0.8–1.6
Posttraumatic stress disorder	1.6 [*]	1.3–2.1	1.8 [*]	1.2–2.6	0.9	0.7–1.2
Social phobia	1.6 [*]	1.2–2.0	1.2	0.8–1.7	1.4 [*]	1.2–1.7
Specific phobia	1.7 [*]	1.2–2.2	1.3	0.7–2.5	2.1 [*]	1.8–2.4
Agoraphobia with or without panic	1.2	0.9–1.6	2.6 [*]	1.4–4.7	1.3	0.9–1.8
Externalizing						
Attention deficit hyperactivity disorder	2.8 [*]	1.6–4.6	0.8	0.4–1.9	1.1	0.8–1.5
Oppositional defiant disorder	1.6 [*]	1.1–2.6	1.0	0.4–2.3	1.7 [*]	1.3–2.2
Conduct disorder	1.4 [*]	1.0–1.8	0.7	0.3–1.4	1.4 [*]	1.1–1.9
Intermittent explosive disorder	1.3	1.0–1.7	0.7	0.5–1.2	1.3 [*]	1.0–1.7
Substance abuse with or without dependence	1.0	0.8–1.2	1.3	0.9–1.8	1.4 [*]	1.0–1.9
Substance dependence with abuse	1.0	0.8–1.4	1.3	0.8–2.1	1.0	0.7–1.4

^aDiscrete time survival analysis controlling for demographic variables, prior traumas, and childhood adversities as of age at onset of separation anxiety disorder, country, and person-year.

^bThe data indicate a discrete time survival analysis predicting the prevalence of the disorder controlling for demographic variables, prior lifetime disorders, prior traumas, and childhood adversities as of age at onset of the disorder, country, and person-year.

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logistic regression analysis predicting 12-month prevalence of separation anxiety disorder among lifetime cases controlling for age at onset and time since onset of separation anxiety disorder, prior lifetime disorders as of the age at onset of separation anxiety disorder, prior lifetime trauma as of the age at onset of separation anxiety disorder, and prior childhood adversities and country.

The data indicate a logistic regression analysis predicting 12-month prevalence of the disorder among lifetime cases controlling for age at onset and time since onset of the disorder, prior lifetime disorders as of the age at onset of the disorder, prior lifetime trauma as of the age at onset of the disorder, prior childhood adversities, and country.

$p < 0.05$ (two-sided test).

*

Predictors of Lifetime DSM-5/Composite International Diagnostic Interview (CIDI) Separation Anxiety Disorder in the Total Sample and by Life Course Stage^a

TABLE 3

Variable	Total Sample			Childhood (Age 13)			Adolescence (Ages 13–17)			Early Adulthood (Ages 18–29)			Later Adulthood (Ages 30)		
	Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI	
Sex															
Female	1.3*	1.2–1.5	1.4*	1.1–1.7	1.1	0.8–1.5	1.4*	1.1–1.9	1.1	0.7–1.7					
Male (reference)	1.0	–	1.0	–	1.0	–	1.0	–	1.0	–	1.0	–			
Education^b															
Student	1.2	1.0–1.6	–	–	–	–	1.0	0.6–1.5							
Low	1.5*	1.2–2.0	–	–	–	–	1.4	1.0–2.2	2.0*	1.3–3.2					
Low-average	1.6*	1.2–2.0	–	–	–	–	1.4	1.0–2.0	2.0*	1.2–3.3					
High-average	1.7*						1.4	1.0–1.9	1.8*	1.2–2.7					
High (reference)	1.0	–	1.0	–	1.0	–	1.0	–	1.0	–					
Marital Status^c															
Never married	1.1	0.9–1.4	–	–	–	–	0.9	0.7–1.1	1.2	0.8–1.8					
Previously married	1.3	0.9–1.8	–	–	–	–	1.6*	1.1–2.3	1.7*	1.1–2.5					
Currently married (reference)	1.0	–	1.0	–	1.0	–	1.0	–	1.0	–					
Number of maladaptive family functioning childhood adversities^{d, e}															
1	1.7*	1.4–2.0	1.7*	1.3–2.2	1.2	0.8–1.8	1.6*	1.2–2.1	2.1*	1.2–3.7					
2	2.0*	1.6–2.4	2.3*	1.7–3.1	1.4	0.8–2.4	1.7*	1.2–2.3	2.0*	1.1–3.4					
3	2.3*	1.8–2.8	2.6*	1.8–3.7	2.1*	1.3–3.4	1.7*	1.2–2.5	2.0*	1.1–3.4					
4	2.8*	2.0–4.0	3.0*	1.9–5.0	1.7	0.8–3.6	3.3*	1.6–6.8	1.9*	1.0–3.8					
5	2.8*	2.1–3.6	3.7*	2.3–6.0	1.0	0.4–2.5	2.5*	1.3–4.6	3.7*	1.5–9.1					
None (reference)	1.0	–	1.0	–	1.0	–	1.0	–	1.0	–					
Number of other childhood adversities^f															
1	1.3*	1.1–1.5	1.5*	1.2–1.9	1.3	0.9–1.9	1.0	0.8–1.3	1.1	0.7–1.5					

Variable	Total Sample			Childhood (Age 13)			Adolescence (Ages 13–17)			Early Adulthood (Ages 18–29)			Later Adulthood (Ages 30)		
	Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI		Odds Ratio	95% CI	
2	1.2	1.0–1.5	1.7*		1.2–2.3		1.2	0.7–2.1		0.8	0.6–1.2		1.0	0.6–1.7	
3	1.8*	1.3–2.4	2.8*		1.6–4.9		1.4	0.6–3.6		1.3	0.7–2.3		0.5	0.2–1.5	
None (Reference)	1.0	–	1.0	–	–	–	1.0	–	–	1.0	–	–	1.0	–	–
Lifetime trauma^g															
War	1.1	0.9–1.3	1.6*		1.0–2.5		1.4	0.7–2.5		0.9	0.6–1.3		1.0	0.6–1.5	
Violence	1.1	0.9–1.2	2.0*		1.2–3.3		0.8	0.5–1.2		1.2	0.9–1.5		0.8	0.5–1.1	
Sexual violence	1.6*	1.3–1.9	2.8		0.6–12.3		3.0*	1.5–5.8		1.6*	1.2–2.1		1.5*	1.0–2.1	
Accident	1.4*	1.1–1.6	1.1		0.7–1.7		1.8*	1.2–2.6		1.3*	1.0–1.7		1.5*	1.0–2.3	
Family death	1.4*	1.2–1.6	1.7*		1.1–2.5		1.3	0.8–2.0		1.3*	1.0–1.6		1.6*	1.2–2.3	
Network events	1.3*	1.1–1.6	1.6		0.9–2.9		1.5*	1.0–2.2		1.3*	1.0–1.7		1.1	0.8–1.5	
Other	1.5*	1.2–1.9	1.9*		1.1–3.3		1.7*	1.0–3.00		1.2	0.8–1.8		2.0*	1.3–3.3	

^aDiscrete time-survival analysis controlling for person-year, country, age at interview, and prior lifetime DSM-IV/CIDI disorders as of separation anxiety disorder age at onset. The total sample model was estimated in all person-years, while the models for the various life course stages were restricted to person-years in the ranges indicated. The measures of education, marital status, and lifetime traumas were dated and were treated as time-varying covariates (i.e., coded as being present only as of the respondent's age when they occurred).

^bThe chi-square test (df=3) statistics for the total sample, early adulthood, and later adulthood are 20.22, 4.01, and 12.60, respectively, with the results for the total sample and later adulthood reaching statistical significance.

^cThe chi-square test (df=2) statistics for the total sample, early adulthood, and later adulthood are 3.13, 10.06, and 5.70, respectively, with the results for early adulthood reaching statistical significance.

^dMeasured using the Maladaptive Family Functioning Scale, which records items for parental mental illness, substance misuse, criminal behavior, domestic violence, physical and sexual abuse, and neglect.

^eThe chi-square test (df=5) statistics for the total sample, childhood, adolescence, early adulthood, and later adulthood are 98.30, 48.08, 10.62, 18.63, and 13.20, respectively, with the results for all age groups except adolescence reaching statistical significance.

^fThe chi-square test (df=3) statistics for the total sample, childhood, adolescence, early adulthood, and later adulthood are 20.23, 23.42, 2.59, 1.89, and 2.01, respectively, with the results for the total sample and childhood reaching statistical significance.

^gThe chi-square test (df=7) statistics for the total sample, childhood, adolescence, early adulthood, and later adulthood are 117.47, 35.25, 44.40, 35.65, and 42.56, respectively, with the results for all age groups reaching statistical significance.

* p<0.05 (two-sided test).

TABLE 4

Prevalence of Severe Role Impairment Among Respondents With 12-Month DSM–5/Composite International Diagnostic Interview (CIDI) Separation Anxiety Disorder as a Joint Function of Country Income, Separation Anxiety Disorder Age at Onset, and 12-Month Comorbidity With the DSM-IV/CIDI Disorders Assessed in the World Mental Health Surveys^a

Country Income and Age at Onset	Total		With Comorbidity		Without Comorbidity	
	%	SE	%	SE	%	SE
Total sample						
4–12 years old	33.9	5.2	37.3	5.9	8.5	8.2
13–17 years old	42.2	7.5	46.5	8.5	23.7	10.8
18–29 years old	35.7	4.3	45.3	5.3	16.7	5.3
30 years old	31.7	5.8	40.4	7.3	21.2	8.9
Total	35.3	2.5	42.4	2.9	18.3	4.3
Low-/lower-middle income countries						
4–12 years old	24.0	12.2	24.7	12.7	0.0	0.0
13–17 years old	14.5	7.9	13.0	8.7	19.4	18.8
18–29 years old	19.8	5.8	32.2	8.5	8.5	5.7
30 years old	9.0	5.4	19.5	10.5	0.0	0.0
Total	17.6	4.1	25.3	6.0	6.9	3.8
Upper-middle income countries						
4–12 years old	38.4	10.6	38.5	11.3	36.8	26.3
13–17 years old	30.6	10.7	27.8	13.1	39.3	17.0
18–29 years old	44.6	8.0	47.9	10.5	35.0	12.2
30 years old	35.4	9.1	46.8	10.5	26.0	13.9
Total	38.2	4.1	41.6	4.4	30.6	8.9
High-income countries						
4–12 years old	33.6	6.1	40.5	7.0	0.0	0.0
13–17 years old	62.3	10.5	71.1	9.2	0.0	0.0
18–29 years old	39.8	6.4	49.1	7.6	14.7	7.7
30 years old	38.1	10.4	41.6	12.5	28.9	16.9
Total	41.4	3.8	49.3	4.3	14.2	5.7

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Logistic regression models assuming additive associations of country income level, age at onset, and 12-month comorbidity with severe role impairment fit the data better (Akaike information criterion=434.1; Bayesian information criterion=468.1) than models that also included all two-way interactions (Akaike information criterion=438.0; Bayesian information criterion=531.6) or all two-way and three-way interactions (Akaike information criterion=458.1; Bayesian information criterion=561.3).