The National Comorbidity Survey Adolescent Supplement (NCS-A): I. Background and Measures

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Abstract

Objective—This paper presents an overview of the background and measures used in the National Comorbidity Survey Replication Adolescent Supplement (NCS-A).

Methods—The NCS-A is a national psychiatric epidemiological survey of adolescents ages 13–17.

Results—The NCS-A was designed to provide the first nationally representative estimates of the prevalence, correlates and patterns of service use for DSM-V mental disorders among US adolescents and to lay the groundwork for follow-up studies of risk-protective factors, consequences, and early expressions of adult mental disorders. The core NCS-A diagnostic interview, the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI), is a fully-structured research diagnostic interview designed for use by trained lay interviewers. A multi-construct, multi-method, multi-informant battery was also included to assess risk and protective factors and barriers to service use. Design limitations due to the NCS-A evolving as a supplement to an ongoing survey of mental disorders of US adults include restricted age range of youth, cross-sectional assessment, and lack of full parental/surrogate informant reports on youth mental disorders and correlates.

Conclusions—Despite these limitations, the NCS-A contains unparalleled information that can be used to generate national estimates of prevalence and correlates of adolescent mental disorders, risk and protective factors, patterns of service use, and barriers to receiving treatment for these disorders. The retrospective NCS-A data on the development of psychopathology can additionally complement data from longitudinal studies based on more geographically restricted samples and serve as a useful baseline for future prospective studies of the onset and progression of mental disorders in adulthood.

Keywords

Adolescent mental disorders; National Comorbidity Survey Adolescent Supplement (NCS-A); Composite International Diagnostic Interview (CIDI); mental disorders; epidemiology

OBJECTIVE

The need for population-based data on the prevalence, correlates, and patterns of service use for mental disorders among American youth has been recognized for nearly two decades by the Institute of Medicine (IOM),[1] the US Surgeon General,[2] and most recently the President's New Freedom Commission on Mental Health.[3] These reports concur that it is critical to obtain nationally representative data on the mental health of youth, both to document the magnitude of the problem and to provide background information for the development of a service system that adequately addresses the mental health care needs of this important segment of the population.

Despite the absence of nationally representative data on mental disorders in youth, a number of regional surveys have provided information on the prevalence and correlates of DSM-III-R and IV mental disorders as well as service use patterns in specific regions of the U.S. including Massachusetts,[4] New York State,[5] North Carolina,[6] Oregon,[7] Puerto Rico,[8] Texas, [9] and a multi-site study in Georgia, New Haven, New York, and Puerto Rico.[10] Advantages of regional studies include their ability to study specific subgroups of the population more intensively, and increase feasibility of evaluating participants in a central laboratory or clinical setting. Although regional differences in patterns of mental disorders could provide clues regarding the potential effect of environmental exposures, the wide variation in the demographic characteristics of the samples and the diagnostic assessment methods preclude such comparisons.

Previous summaries of the prevalence of mental disorders in population surveys of U.S. youth concluded that about one out of every four youth meet criteria for a DSM disorder,[11] while about one out of every ten youth meet the Substance Abuse and Mental Health Services Administration (SAMHSA) criteria for a Serious Emotional Disturbance (SED).[11] These surveys have also shown that most youth with mental disorders fail to receive treatment,[12–14] including the majority of youth with SED.[15]

Aside from providing extensive information on regional differences in mental disorders in the U.S., the majority of prior population studies of mental disorders in U.S. youth also included longitudinal follow-up that provided information about the order of onset of mental disorders, age-specific incidence, longitudinal predictors of onset and course, and information about the consequences of these disorders.[4–7] These prospective follow-up studies show that child and adolescent mental disorders are related to a wide array of adverse outcomes,[16, 17] highlighting the importance of obtaining more broadly representative data that can be used to advance mental health care policy planning efforts.

A Congressional mandate triggered by an Institute of Medicine report encouraged the National Institute of Mental Health (NIMH) in the late 1990s to establish a series of initiatives to produce national estimates of the prevalence and correlates of youth mental disorders. The first initiative was a multi-site study called the Use of services, Need, Outcomes, Costs in Child and Adolescent Populations study initiative (UNOCCAP). A UNOCCAP Oversight Board was created and charged with providing scientific guidance for the study. This board identified five critical gaps in knowledge as the focus of UNOCCAP efforts: the prevalence of disorders and impairments; the services used to treat these disorders and impairments; the costs of treatment and the influences of insurance benefits on use of services; pathways into and out of disorders and treatment; and the effectiveness of different services for specific youth disorders.[18] Two studies generated from this project assessed prevalence and service needs in children in four U.S. sites[17, 19] but the nationally representative survey initially planned to be carried out through the UNOCCAP initiative to address the other issues was prematurely terminated.

In an effort to provide preliminary national data in the wake of the termination of the UNOCCAP project, NIMH added brief assessments of youth mental disorders to two large national surveys carried out by the National Center for Health Statistics beginning in the late 1990s. First, a brief dimensional scale of recent (past 6 months) symptoms of mental disorders, the Strength and Difficulties (SDQ) Questionnaire,[20] was added to the National Health Interview Survey (NHIS) in 2001. The NHIS assesses close to 50,000 families containing a total of approximately 10,000 youth (ages 4–17) each year.[21, 22] Second, selected modules from the NIMH Diagnostic Interview Schedule for Children (DISC) Version 4[23] were administered to a sample of 8,449 youth (ages 8–19) in the 1999–2004 National Health and Nutrition Examination Surveys.[24–26]

In addition to these efforts, NIMH took advantage of the opportunity to collect nationally representative data on adolescent mental health by extending the lower age range of the National Comorbidity Survey Replication (NCS-R),[27] a nationally representative survey of adult mental disorders that was fielded in 2001–3. The decision was made to limit the sample to youth ages 13–17 because pilot studies showed that the interview schedule used in the NCS-R, the WHO Composite International Diagnostic Interview (CIDI) Version 3.0,[28] had limited validity among youth younger than age 13. This NCS-R Adolescent Supplement (NCS-A) was consequently carried out in a nationally representative sample of youth in the age range of 13–17 (n= 10,148).

The NCS-A was designed to estimate the lifetime-to-date and current prevalence, age-of-onset distributions, course, and comorbidity of DSM-IV disorders in the child and adolescent years of life among adolescents in the US; to identify risk and protective factors for the onset and persistence of these disorders; to describe patterns and correlates of service use for these disorders; and to lay the groundwork for subsequent follow-up studies that can be used to identify early expressions of adult mental disorders. The remainder of this report presents an overview of the measures used in the NCS-A. Companion papers present a description of the NCS-A study design[29] and the concordance of the DSM-IV diagnoses generated in the main NCS-A interview[30] with diagnoses based on blinded clinical reappraisal interviews.[30] A separate report presents a detailed statistical analysis of NCS-A design effects and an evaluation of the effects of weight trimming on the design bias-efficiency tradeoff.[31]

METHOD

As noted above, the NCS-A used a modification of the CIDI administered to adults in the NCS-R. That version includes assessments of four broad classes of DSM-V disorders: anxiety disorders (panic disorder, generalized anxiety disorder, phobias, post-traumatic stress disorder, separation anxiety disorder), mood disorders (major depressive disorder, dysthymic disorder, bipolar disorder), behavior disorders (attention-deficit/hyperactivity disorder, conduct disorder, oppositional defiant disorder, intermittent explosive disorder), and substance disorders (alcohol and illicit drug abuse and dependence, nicotine dependence). (Table 1) We also included sections on other disorders (neurasthenia, eating disorders) and on other indicators of emotional functioning (non-specific psychological distress, suicidality) along with two sections on service use for emotional problems. One of the service sections dealt explicitly with the details of recent medication use, while the other dealt with broader services issues. In addition, the instrument included assessments of several important risk and protective factors.

A. Modifying the CIDI for use with adolescents

While the version of the CIDI used in the NCS-A is very similar to the NCS-R version, a number of important modifications were made for the NCS-A to make sure the instrument was relevant to the special experiences and language of youth. A workgroup of researchers and

clinicians with diverse expertise was convened to oversee the systematic revisions of the CIDI for use with adolescents. The workgroup was chaired by one of us (KRM) and also included collaborators from Harvard Medical School (RCK, Nancy Sampson), Yale University (SA, Lisa Dierker), and McMaster University (David Offord, Yvonne Racine, Allison Van Nie).

A standard four-step process of instrument development proposed by experts in survey methodology was used to guide the efforts of the workgroup.[32] First, diagnostic sections of the adult CIDI were reviewed to determine whether assessment for particular disorders should be included or removed. Decisions were made to eliminate assessments of Obsessive-Compulsive Disorder, Pathological Gambling, Dementia, and Psychosis based on the presumed low prevalence of these conditions among youth and in an effort to minimize respondent burden.

Second, the language in the remaining CIDI sections was modified by the Yale and McMaster teams to enhance comprehension with adolescents using an iterative process. First, problem questions were identified based on cognitive debriefing interviews, a set of[32] qualitative and flexible interviews designed to assess the processes for answering questions, as well as comprehension of the questions and response categories.[33, 34] Second, the questions were modified based on insights obtained in the cognitive interviews. Third, the modified sections were administered to adolescents to confirm that the changes had the desired effects. Independent modification of the services sections were made by other collaborators (RCK, EJC, Philip Wang).

Third, CIDI modules were modified in content to make them more germane to the contexts and experiences of adolescents. The most common change of this type required altering references from adult contexts (e.g., work life, parenting) to adolescent contexts (e.g., school life, peer relationships). Other changes included updating drug terminology (including slang terms) in the substance use module and adding more detailed assessments of symptoms in the modules for disorders of childhood and adolescence (i.e., Attention-Deficit/Hyperactivity Disorder, Oppositional Defiant Disorder, Conduct Disorder and Separation Anxiety Disorders). Changes in content were also piloted in the adolescent cognitive interviews and were revised as necessary.

Fourth, the finalized revision of each diagnostic module was reviewed by the Harvard collaborators for meaning, logic, and comparability to the adult version. Some language changes made for adolescents were incorporated into the adult version as well to increase comparability. Each diagnostic section was then systematically piloted to test the flow and timing among adolescents, with subsequent modifications to reduce the length of the diagnostic sections. The final sections were then prepared for computer administration to the adolescents using laptop computer-assisted personal interview (CAPI) methods.

B. Adding a parent/surrogate self-report assessment

We attempted to collect information from a parent or parent-surrogate of each adolescent in order to obtain an additional perspective on the adolescent's mental health and its correlates. A parent self-report questionnaire (SAQ) was developed for this purpose. Although an interview with the parent would have been preferable because the mode of administration would be the same as that of the child, and follow-up questions to clarify responses could have been included, a self-report format was necessary because of budgetary constraints. As shown in Table 1, parent reports focused on the five adolescent disorders for which previous methodological research has most consistently shown that parental reports are important for making diagnoses: attention-deficit/hyperactivity disorder, conduct disorder, oppositional defiant disorder, major depressive episode, and dysthymic disorder.[35, 36] As in previous studies, we combined diagnostic information obtained from adolescents and parents when

making final diagnostic classifications.[37] The Strength and Difficulties Questionnaire (SDQ) [20] was also included in the SAQ in order to obtain a dimensional rating of child mental health problems as well as to provide calibration data that could be used to interpret the SDQ scores in the NHIS. The average administration time for the final SAQ in pilot studies was approximately 45 minutes.

C. Expanding the CIDI

We also expanded the CIDI in a number of ways in both the NCS-A and NCS-R. First, we lowered the CIDI diagnostic thresholds in order to include complete assessments of sub-threshold cases. Our goal here was to gather information that could help inform the refinement of diagnostic thresholds in the upcoming DSM-V and ICD (International Classification of Diseases)-11 revisions. For example, we added an assessment of binge-eating disorder among respondents who reported symptoms of eating disorder but who did not meet full criteria for either bulimia nervosa or anorexia nervosa.[38] We also added a full assessment of the other symptoms of generalized anxiety disorder among respondents who reported episodes of worry that lasted no longer than one month (the DSM-III minimum duration requirement) even though the DSM-IV minimum duration requirement is six months.[39] Similar expansions were made to most other diagnostic sections. In a related way, we added a number of questions to the CIDI to allow sub-typing distinctions to be made that have been discussed in the literature as relevant for DSM-V or ICD-11 revisions.

Second, we added a fully-structured version of a standard disorder-specific clinical severity scale to each major diagnostic section of the CIDI. This was done both to have a dimensional representation along with the categorical diagnostic classification of the disorder and to create a cross-walk between the results of our population surveys and the results of clinical studies that use these clinical severity scales. The dimensional severity scales included such scales as the Quick Inventory of Depressive Symptomatology Self-Report (QIDS-SR)[40] for major depressive episodes, the self-report version of the Young Mania Rating Scale (YMRS)[41] for mania/hypomania, and the Panic Severity Test[42] for panic disorder. The inclusion of dimensional assessments is especially important in light of concerns in the literature regarding the validity of the categorical approach to classification among children and adolescents[43] and the suggestion that a dimensional approach can enhance our understanding of the major components of childhood disorders, including disturbances in normal dimensions of emotions, behavior and cognition.[44–55]

Third, we enhanced the standard CIDI assessment of disorder-specific role impairment by including in each diagnostic section an expanded version of the Sheehan Disability Scales.[56] As part of this expansion, we added an assessment of the prevalence and impairments associated with a number of commonly occurring chronic physical disorders in order to make it possible to study the relative impairments of mental and physical disorders as well as to study patterns and consequences of mental-physical comorbidity.[57]

RESULTS

The NCS-A provides an opportunity to obtain nationally representative data on a broad range of risk and protective factors for adolescent mental disorders. A multi-construct, multi-informant (adolescent, parent), multi-method (interview, questionnaire, biological samples) battery was developed for this purpose. The research teams from Harvard, Yale, and McMaster worked collaboratively to develop this battery using a four-step process that included: review of the literature on risk and protective factors; selection of existing measures and assignment of the informant (i.e. adolescent, parent) needed for the assessment; preliminary development, pilot testing, and field testing of the modules; and final modifications prior to production interviewing.

A central list of constructs was developed to organize our work in developing a risk-protection factor battery. The primary goal in selecting the constructs from this list was to develop a broad-based inventory that could be assessed feasibly in a large face-to-face national survey that featured self-report and parent-informant reports as the main sources of data. A comprehensive literature review was conducted to develop the central list. Advice was also sought from numerous experts in child and adolescent developmental psychopathology to refine the central list and to select the subset of constructs to be used in the survey. Constructs were considered if they had either been identified in previous clinical or community studies or hypothesized to be important predictors of child-adolescent mental disorders.

The constructs we considered were divided into three levels: *individual* level (e.g., socio-demographics, developmental factors, cognitive and academic abilities-achievements, physical health, stressful life events), *family* level (e.g., family structure, stability and adaptability, parenting behavior, parental psychopathology, family stress), and *environmental/ contextual* level (e.g., school and neighborhood characteristics). In selecting the final subset of these constructs, priority was placed on constructs identified in prospective research that appeared to have causal influences on the development of psychopathology in adolescents.[5, 16, 58–62] Evidence for the specificity of the constructs was also considered,[63] with lower priority given to constructs that were not reliably assessed in an interview or questionnaire format. When multiple scales for a given construct were available, priority was given to scales that were widely used and accepted in the field, had sound psychometric properties, and were available in abbreviated form.

The specific measures used to operationalize each construct were selected from reviews of the epidemiological, clinical, and developmental literatures and evaluations of existing instruments from epidemiological studies. The methodological work carried out in preparation for the UNOCCAP study was of great value in this regard, as was the methodological work in a number of other studies, including the Methods for the Epidemiology of Child and Adolescent Mental Disorders (MECA) study,[10, 64] the National Longitudinal Study of Adolescent Health, [65] the National Health Interview Survey,[66] the National Health and Nutrition Examination Survey (NHANES),[24, 67] the Ontario Child Heath Study and Follow-up Study,[68] the National Longitudinal Survey of Children and Youth (NLSY),[69] the Great Smoky Mountain Study,[6] and the Yale High Risk Study of Comorbidity of Anxiety and Substance Use Disorders.[70] We also consulted with numerous experts on the selection of measures. The battery of risk and protective factors was evaluated in cognitive interviews that assessed the ability of respondents to comprehend the questions and response categories. Questions that were unclear in the cognitive interviews were modified and re-tested in subsequent pilot interviews. Table 2 presents a summary of the measures that were included for the three levels of assessment by source of information. A brief overview of some of the main measures is presented in the remainder of this section.

A. Individual-level constructs

The NCS-A assesses all the well-established socio-demographic correlates of mental disorders (e.g., age, sex, race-ethnicity, parental socio-economic status, religious affiliation). A number of these measures are markers of environmental adversity that have been associated with child, adolescent, and adult disorders.[9, 71, 72] More explicit information is also collected on lifetime exposure to traumatic stressful events, ongoing childhood adversities, and past-year life events and difficulties based on evidence that such stressors are significantly associated with child-adolescent mental disorders.[73, 74] Along with these more general stress measures, extensive questions are included on chronic physical conditions, accidents, and injuries based on evidence of strong associations between mental and physical disorders.[75–77] A wide range of

health behaviors are also assessed, including smoking, sleep patterns and problems, diet, and exercise.

Dimensional measures of psychological traits that have been shown to be associated with specific mental disorders in prospective research are also included in the NCS-A battery. These measures include: sensation seeking, neuroticism, aggression-hostility, sociability, self esteem, behavioral inhibition and emotionality as assessed in a number of standard scales of personality, temperament, and worldviews.[78–82] The core personality questions are included both as self-reports in the adolescent survey and as informant reports in the parent survey in order to provide two independent assessments.

The battery also assesses a range of individual competencies that may protect against the development of psychopathology. Included here are measures of cognitive, academic, and social competence, as well as measures of coping, talents, and activities. In addition, the matrices scale of the Kaufman Brief Intelligence Test (KBIT),[83] a nonverbal measure of fluid thinking and problem-solving ability, is included as an index of cognitive function. This scale, which takes approximately 10–15 minutes to complete, is the only KBIT scale included in the NCS-A because of time constraints. It was chosen because it is not as highly correlated with language skills and schooling experiences as other scales of cognitive functioning[84] and because, unlike most other brief intelligence tests, it can be administered with good reliability and validity by a lay interviewer who has no formal experience in intelligence testing.

An extensive series of questions about prenatal, perinatal, and early childhood development was selected for use in the NCS-A from the larger batteries developed for the National Collaborative Perinatal Project[85] and the Nurses Health Study.[86] Included here are questions asked of the parent (typically the biological mother) about pregnancy factors and complications, developmental milestones across infancy and early childhood, and adolescent development. This information will enable us to investigate links between early development and subsequent mental disorders. Questions about pubertal development are also included in the NCS-A with the Tanner stage illustrations from the Adolescent Development and Behavior project[87] administered to our adolescent respondents in addition to retrospective reports about the age when they first entered each Tanner stage up to their current stage.

Separate saliva samples were collected at the beginning and end of each NCS-A adolescent interview to assess stress hormones, including concentration of cortisol, DHEA-S (dehydroepiandrosterone) sulfate and subacute hypothalamic-pituitary-adrenal (HPA) axis and autonomic nervous system activation. With the large sample and complexity in scheduling interviews it was not feasible to collect the saliva sample at a specific time or times of day. However, collection of saliva samples is still valuable because this study provided a unique opportunity to collect these measures in such a large and well-characterized sample. We considered the interview a mild stressor so we could test hypotheses from prior studies regarding associations of pre- and post-interview levels and before-after changes in neuroendocrine activation during stress with a number of mental disorders.[88–90] Saliva measures of reproductive hormones can also be assessed to expand our understanding of the role of sex hormones on sex and age differences in the development of psychopathology in the age range of the sample.[91, 92]

We did not collect DNA in the adolescent sample because we had not established consent procedures for DNA collection in the adult sample. However, we intend to collect saliva samples for DNA in the first follow-up survey of the cohort when the youngest respondents reach adulthood and can provide informed consent for genetic studies.

B. Family-level constructs

The NCS-A includes extensive questions about family factors that have been linked to child-adolescent psychopathology in previous research.[72, 93] One set of these measures assesses aspects of family structure (e.g., parental, death, divorce, single parenthood), birth order, and sibship size that have been related to child development and psychopathology in previous research.[4, 94, 95] Because of the well-established links between parental and child psychopathology,[96–98] additional questions are included in both the adolescent and parent surveys about parental history of psychopathology using items from the Family History Research Diagnostic Criteria Interview[99] and its extensions.[100]

A large body of research exists regarding the associations of various parenting styles (e.g., parental monitoring, neglect, harsh discipline, intrusiveness) with specific mental disorders among children and adolescents.[101, 102] The NCS-A consequently includes questions about parenting styles. The Parental Bonding Instrument[103] is used for this purpose. Based on uncertainties about the differential effects of parenting styles of fathers and mothers, these assessments are carried out separately for fathers and mothers. As the associations of parenting styles with child outcomes are part of a more complex web of family relationships and stresses, [63] though, the adolescent and parent surveys also assess parent and sib relationships with the adolescents along with a number of dimensions of parent-child and familial functioning (e.g., communication, protection, relationship quality).

C. Environmental constructs

In addition to the more immediate family factors assessed, the NCS-A battery includes assessments of the three other environmental domains of risk and protection most relevant to adolescents: peers, schools, and neighborhoods. Peer factors are known to be strongly related to the psychological outcomes of youth as potential risk, protective, and mediating factors in the development of psychopathology.[104, 105] Schools and neighborhoods are the primary environmental contexts in which adolescents develop.[106] Schools have been a focus of study as both complex contexts in which disorders develop and as service provision settings. The neighborhoods in which adolescents live have also been studied in relation to health and mental health outcomes.[107, 108] Most notably, the Project on Human Development in Chicago Neighborhoods found substantial variation in internalizing disorders across different neighborhoods,[109] affirming the potential importance of contextual factors.

The NCS-A measures of peer factors include assessments of the extent to which each adolescent is embedded in a peer network, duration of network membership, size and density of the network, the age and sex composition of the network, the behavior patterns (e.g., substance use, delinquency, sexual behaviors, risk-taking behaviors) and normative expectations (e.g., plans for attending college) of network members, and the extent to which the adolescent has access to various types of social support from network members along with various types of negative network interactions (e.g., demands, conflicts). Parallel questions are asked about relationships with romantic partners. As we have a special interest in the associations of early physical maturity in conjunction with participation in social networks of older youth with subsequent externalizing disorders, a number of questions are included in this section of the instrument about timing and duration of network membership.

NCS-A respondents were sampled from a nationally representative sample of 320 schools. Information about school context was obtained in two ways.[31] First, aggregated small area Census data for the catchment area of each school were collected to provide information on the socio-demographic composition of the population served by the school. Second, we administered separate surveys to the Principal and the Mental Health Coordinator in each participating school to collect information about school structures and processes that could be

used to study the determinants of between-school variation in the probability that an adolescent with a mental disorder was detected and treated. Principals were asked questions about school resources, curriculum, policies, and services for adolescents with emotional and behavioral problems. Mental Health Coordinators were identified by the Principal and asked additional questions about off-site resources and outreach to parents. In case where the school did not have a Mental Health Coordinator, the data in the Mental Health Coordinator SAQ was provided by a school nurse or guidance counselor or the Principal. These school-level surveys were considered important in light of previous evidence that a substantial proportion of the treatment of youth with mental disorders in the US occurs either at school or at the behest of school officials[106] and evidence that substantial between-school variation exists in the probability that youth with mental disorders are detected and treated.[110]

Neighborhood effects have only seldom been studied in previous research of youth mental disorders. The scant research in this area has generally, although not always,[109] failed to find powerful neighborhood-level effects after controlling for individual and family factors.[111,][112] However, there is reason to believe that this failure might have been due to these studies focusing on aggregate assessments of small area Census data rather than on more nuanced dimensions of neighborhood context. Specific characteristics of communities, particularly "social capital,"[113] or the extent to which adolescents living in a given community are connected to family, friends, neighbors, and civic institutions and have relationships characterized by trust, mutual aid, and norms of reciprocity, have been shown to be powerful determinants of adolescent health and well-being.[114] We have assessed many of these characteristics of communities in the NCS-A, and plan to combine these measures with other aggregated data bases that include community-level indicators of civic involvement that can be used to characterize community social capital (e.g., number of churches and average weekly attendance in every community in America, number of boy scouts in each community in America, etc.).

D. Interview length

Because of the large amount of material we needed to include in the assessment, the adolescent interview in the NCS-A was quite long, with an average length of two and a half hours (range 69 minutes to 347 minutes). The long duration can be attributed to inclusion of extensive information that supplemented the actual diagnostic sections There was considerable variability in response times, though, with adolescents in the household sample taking, on average, slightly longer than those in the school sample. This variation was due to interview length depending on the number of disorder sections completed by the adolescent, as these sections have a stem-branch structure. This structure has been found to create problems in the past, as respondents who endorse multiple disordersrather quickly catch on to the fact that endorsement of a diagnostic stem question will result in more questions, leading some respondents to deny stem questions in what appears to be a conscious effort to shorten the interview.[115] In order to address this problem, the CIDI 3.0 begins with a screening section in which respondents are asked the diagnostic stem questions for all the lifetime disorders assessed in the survey. The responses to these screener items determine which supplementary sections are subsequently administered. Respondents who did not endorse any screening items for disorders took an average of a little under two hours to complete the survey, while individuals with several complex disorders spent an average of nearly three hours on the interview. The average duration of the NCS-A CIDI is comparable to that of the K-SADS,[116] which has an average length of 180 minutes for the diagnostic sections, but considerably longer than that of the highly structured Diagnostic Interview Schedule for Children and Adolescents (DISC)[17] which takes an average of 70 minutes in the community and up to 120 minutes in clinical samples.

To address the problem of respondent burden in what we knew during the design phase would be a long interview, we carefully evaluated each skip instruction to make sure we were skipping respondents out of sections as soon as we had the information needed to evaluate the issues under consideration. This was especially important in the diagnostic sections, where it was possible to skip respondents once it became clear that they either met criteria or failed to meet any symptom required for a diagnosis. However, given our interest in sub-threshold diagnoses in adolescents, we balanced the desire to use skips with our interest in obtaining sub-threshold information. During the data collection phase, administration of especially long interviews was broken up into multiple interview sessions.

CONCLUSIONS

This paper has presented an overview of the goals and measures of the NCS-A. Several methodological compromises were made in carrying out the NCS-A as a result of the fact that the study was developed as a post hoc supplement to the previously funded NCS-R with a tight fixed budget and a mandate to interview at least 10,000 respondents. First, we were unable to include children under age 12 in the sample. This means that nationally representative data on the prevalence and correlates of mental disorders among children are still not available. Second, the cross-sectional nature of the survey precluded our ability to document temporal priorities in the associations of mental disorders with putative risk and protective factors. Several prior regional epidemiologic surveys in the US have demonstrated that it can be very useful to have longitudinal data of this sort.[117], [118] Third, surrogate information was obtained only from one parent using a self-administered questionnaire rather than a direct interview. We would have preferred to collect data from both parents and to do this in interviews rather than self-administered questionnaires because an interview format would have provided the opportunity to qualify parents' responses to the questions. We would also have liked to obtain data from teachers who could have provided information on the functional impairment in the school context. These extensions were not possible, though, with the project budget.

Despite these limitations, the NCS-A contains a great deal of valuable information that can be used to produce nationally representative estimates of the prevalence and correlates of adolescent mental disorders, risk and protective factors for these disorders, patterns of service use for these disorders, and barriers to receiving treatment. The inclusion of dimensional severity scales within the diagnostic sections of the NCS-A interview provides an important link to clinical samples that has not been available in prior population-based studies of adolescents. In addition, the assessment of sub-threshold manifestations of many of the disorders included in the NCS-A provides valuable information on the spectrum of expression of these conditions, an especially timely contribution with the growing consensus for the need to assess the underlying dimensionality of the manifestations of mental disorders. In addition, the NCS-A can expand the investigation of the striking disparity between need for treatment and receipt of treatment that has been documented in smaller local and regional studies.[119], [120] The health disparities found for other illnesses can also be investigated as they apply to adolescent mental disorders, so that national health care policies can focus on this serious problem.

Because of the multi-faceted assessment of disorders in addition to the inclusion of a wide-ranging battery of risk and protective factors, we expect that the cross-sectional NCS-A can also make important contributions to our understanding of appropriate diagnostic thresholds, the separate and joint effects of risk and protective factors, and the determinants of help-seeking for these disorders. The data on the development of psychopathology based on the retrospective measures in the NCS-A can also complement existing longitudinal studies based on more limited samples and serve as a useful baseline for future prospective assessments of the

progression of adolescent disorders into early adulthood and of the child-adolescent predictors of first onsets of mental disorders in early adulthood.

Acknowledgments

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Table 1

Diagnostic information about adolescents in the National Comorbidity Survey-Adolescent Extension by informant

Measure	Adolescent Interview Sections	Parent Questionnaire[1]
I. Mood disorders	Major depressive episode	+
	Dysthymic disorder	+
	Mania-hypomania	
	Irritable depression	
II. Anxiety disorders	Separation anxiety disorder	+
	Specific phobia	
	Social phobia	
	Agoraphobia	
	Panic disorder	
	Generalized anxiety disorder	
	Post-traumatic stress disorder	
III. Disruptive behavior disorders	Attention-deficit/hyperactivity disorder	+
	Conduct disorder	+
	Intermittent explosive disorder	
	Oppositional defiant disorder	+
IV. Substance use disorders	Alcohol abuse-dependence	
	Illicit drug abuse-dependence	
	Nicotine dependence	
V. Other disorders	Eating disorders	
	Neurasthenia	
VI. Emotional functioning	Suicidality	
	30-Day Symptoms	6-month symptoms
VII. Services	Pharmacoepidemiology Services	Medications Services

[1] + indicates that the diagnosis was included in parent self-administered questionnaire

Table 2

Risk factors and Correlates in National Comorbidity Survey-Adolescent Extension

Construct	Sub-constructs/Items	Informant
INDIVIDUALFACTORS		
Demographics		
Age	Date of birth; Age	1
Socioeconomic status	SES; Employment; Education level; Finances	1,2
Economic deprivation	Finances; Family government assistance; Homelessness	1,2
Environmental adversity	Rural, urban, suburban; Family changes; Mobility	1,2
Race/ethnicity/religion		1
Immigration history	History; Citizenship; Language	1,2
Health and Behavior Symptoms		
Behavior problems and symptoms	Emotional symptoms; Conduct problems; Hyperactivity/Inattention; Peer relationship problems; 30-day symptoms; Chronicity; Distress; Impairment	1,2
General functioning		3
Health	General health; Chronic health conditions (ever, past 12 months, onset, treatment); Accidents	1,2
Current health behaviors	Smoking; Sleep patterns (time to bed, #hours sleep); Diet; Exercise	1
Sleep problems	Insomnia; Daytime sleepiness; Other	1
Obstetric/Gynecologic History	Sexual intercourse; Pregnancy; Childbirth; Miscarriage; Abortion; Oral contraceptives; Sexual orientation; Premenstrual syndrome	1
Sexual behavior	Ever; Age; #Partners (past 12 mos); Condom use	1
Developmental Background		
Pre-, Peri-, and early child developmental history	Pregnancy/delivery complications; Birth weight; Maternal substance use during pregnancy; Early illness, health problem, injury, medical procedures; Handedness; Learning disability; Developmental disorder	1,2
Pubertal development	Age first menstruation; Timing of development; Tanner stages of morphological development	1
Individual Characteristics		
Personality/Temperament Traits	Impulsive sensation seeking; Neuroticism-Anxiety; Aggression-hostility; Activity; sociability; Fatalistic worldview; Social desirability; Self-esteem; Locus of control; Emotionality/regulation; Behavioral inhibition	1,2,3
Personality Disorders	Screen	1,2
Coping strategies		1
Cognitive/Academic competence	Nonverbal intelligence; Subjective and Observed intelligence; School performance; Special education classes/school services	1,2,3
Social Competence	Talents/abilities; Involvement in extracurricular activity; Peer relations	1,2
Attractiveness	Facial; Total appearance	1,3
Adult responsibilities	Ever; Kind; Age	1
Ethnic/racial Identification	Ideas and feelings; Time; Friends; Marriage	1
Religiosity	Attendance; Importance	1
Environmental Factors		
Life Events		1,3
Household conditions	Access; Cleanliness; Decorations; Books; Defects; Crowding; Smoking; Guns/weapons	1
Presence of caring adult		1
Media exposure	TV; Music; Computer/internet	1

Construct	Sub-constructs/Items	Informant
Time spent	TV; Music; Telephone; Computer/internet; Reading; Homework; Working; Chores	1,2
Arrests/Incarceration	Ever, Age, # Times, Property, Violent/other crimes	1
FAMILIAL FACTORS		
Household composition	Members; Ages; Sex; Relationship to Adolescent; Head of Household	1,3
Family pedigree	Biological parents; Man/woman who raised Respondent; Biological, half, and step/foster siblings; Biological offspring	1
Parent psychiatric and health history	Depression; GAD; Panic; SUD; ASPD; Suicide; Impairment; Smoking; Cause of death; Chronic health problems; Service use	1,2
Sibling emotion and behavior problems	Substance use; Depression; Anxiety; Behavior problems	1
Marital history	Status; History; Marriage-like relationship	1
Parental marital relationship	Marital history; Relationship quality; Conflict/violence	1,2
Parent-adolescent relations	Emotional closeness; Protection; Parenting styles; Communication; Conflict; Neglect; Abuse/violence; Parental monitoring/supervision	1,2
Relationship with own child	Quality; Abuse/Violence	1
Sibling relations	Closeness; Conflict/violence	1,2
Family functioning	Adaptability; Cohesion; Religiosity	1,2
Other parent factors	Personality; Social support; Activities/skills; Competencies	2
PEER, SCHOOL, NEIGHBORHOOD FACTORS		
Peer relations	N of close friends; Frequency of contact; Popularity; Shyness; Leadership; Influence; Support	1,2
Romantic partner relations	Dating; History; Quality; Conflict/violence	1
Peer/Romantic partner emotion & behavior problems	Depression and anxiety; Substance use; Delinquency	1,2
School involvement	Grades; Activities	1
School environment	Type of school; School changes	1,2
Neighborhood bonding and safety		1,2

Key: 1 = Adolescent; 2=Parent; 3=Interviewer