Department of Mental Health and Alcohol Research, National Public Health Institute,
Helsinki, Finland
and
Department of Clinical Medicine
Hospital for Children and Adolescents/Child Psychiatry
Helsinki, Finland

DEPRESSIVE DISORDERS AMONG YOUNG ADULTS

Terhi Aalto-Setälä

Academic dissertation

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Kansanterveyslaitos (KTL)
Mannerheimintie 166
FIN-00300 Helsinki, Finland
puh. (09) 47441, fax (09) 4744408

Folkhälsoinstitutet
Mannerheimvägen 166
FIN-00300 Helsingfors, Finland
tel. (09) 47441, fax (09) 4744408

National Public Health Institute (NPHI)
Mannerheimintie 166
FIN-00300 Helsinki, Finland
tel. –358-9- 47441
fax -358-9- 4744408

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Supervised by

Docent Mauri Marttunen, M.D., Ph.D.
Department of Mental Health and Alcohol Research
National Public Health Institute, Helsinki

and

Professor Jouko Lönnqvist, M.D., Ph.D.
Department of Mental Health and Alcohol Research
National Public Health Institute, Helsinki

Reviewed by

Associate Professor Päivi Rantanen, M.D., Ph.D.
Department of Adolescent Psychiatry
University of Tampere

and

Docent Jukka Hintikka, M.D., Ph.D.
Department of Psychiatry
University of Kuopio

To Iiro, Laura, Erkka, Kerttu, Katri and Iiris

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TIIVISTELMÄ

Nuorilla on mielenterveyshäiriöitä kaksi kertaa enemmän kuin lapsilla ja jotakuinkin yhtä paljon kuin aikuisilla. Erityisesti mielialahäiriöt yleistyvät nuoruusvuosina. Niiden esiintyvyys on suurimmillaan myöhäisnuoruudessa ja varhaisaikuisuudessa. Masennustiloilla on huomattava kansantaloudellinen merkitys ja ne vaarantavat monin tavoin nuoruusiän suotuisaa psyykkistä kehitystä sekä siirtymävaihetta aikuisuuteen. Kansainvälisissä tutkimuksissa on osoitettu, että vain pieni osa masentuneista nuorista ja nuorista aikuisista on hoidon parissa.

Tässä tutkimuksessa on nyt ensimmäistä kertaa arvioitu mielenterveyshäiriöiden, erityisesti masennuksen esiintyvyyttä suomalaisten nuorten aikuisten ikäryhmässä sekä kartoitettu mielenterveyspalveluiden tarvetta ja käyttöä. Väitöstyö on osa Kansanterveyslaitoksen Mielenterveyden ja alkoholitutkimuksen osastolla tehtyä seurantatutkimusta, jonka perusvaihe toteutettiin kyselylomakkein kymmenessä helsinkiläisessä ja jyväskyläläisessä lukiossa. Seurantavaiheessa viisi vuotta myöhemmin 20-24-vuotiaille tutkittaville lähetettiin uusi kysely ja kyselyvastausten perusteella osa kutsuttiin psykiatriseen haastatteluun. Kyselytieto saatiin 651 nuorelta aikuiselta (92% seurantajoukosta), joista 245 haastateltiin strukturoidulla diagnostisella haastattelulla.

Jokin ajankohtainen mielenterveyden häiriö todettiin lähes neljänneksellä. Yleisimmät häiriöt olivat masennustilat, ahdistuneisuushäiriöt ja päihdehäiriöt. Merkittävä toimintakyvyn lasku todettiin noin puolessa kaikista mielenterveyshäiriöistä. Naisilla ilmeni mielenterveyshäiriöitä miehiä useammin, lukuun ottamatta alkoholin väärinkäyttöä ja persoonallisuushäiriöitä. Masennus oli yleisin häiriö: joka kymmenes nuori aikuinen oli tutkimusta edeltäneen vuoden aikana kärsinyt masennuksesta, johon liittyi merkittävä toiminnallinen haitta. Naisilla masennus oli noin kaksi kertaa yleisempää kuin miehillä. Suurimmalla osalla masentuneista voitiin todeta jokin muu samanaikainen mielenterveyden häiriö. Samanaikaissairastaminen oli yhteydessä vaikeampaan häiriöön kuin jos tutkittavalla todettiin yksinomaan masennus.

Nuorten aikuisten mielenterveyshäiriöt todettiin vahvasti alihoidetuiksi: Kolmannes kaikista tutkittavista, joilla todettiin jokin ajankohtainen mielenterveyden häiriö, ja joka toinen masentuneista oli ollut kyseisen häiriöjakson aikana yhteydessä mielenterveyspalveluihin. Tutkimushetkellä hoidon parissa oli heistä alle viidennes. Naisilla oli aiempia hoitokontakteja ja koettua hoidon tarvetta miehiä enemmän, mutta masennusjakson aikaisia hoitokontakteja naiset ja miehet ilmoittivat yhtä usein. Samanaikaissairastaminen lisäsi hoitopalveluihin hakeutumisen todennäköisyyttä.

Tutkimuksessa osoitettiin myös nuoruuden aikaisten masennusoireiden huomattava ennustemerkitys varhaisaikuisuuden mielenterveydelle. Niillä, joilla lukiovaiheessa ilmeni pitkäaikaisia tai toistuvia masennusoireita, todettiin nuorina aikuisina muita useammin mielenterveyshäiriöitä, erityisesti masennusta, samanaikaissairastamista, huonoa toimintakykyä sekä alkoholiongelmia.

Lisäksi väitöstyössä verrattiin kahta erilaista vakavan masennuksen tunnistamisessa käytettävää haastattelumenetelmää. Pidempi haastattelu osoittautui lyhyttä tarkemmaksi. Tulos korostaa kliinistyyppisen haastattelun merkitystä silloin kun pyritään vakavan masennuksen luotettavaan diagnosointiin.

ABBREVIATIONS

APA	American Psychiatric Association
BDI	Beck Depression Inventory
CI	Confidence Interval
CIDI	Composite International Diagnostic Interview
CIDI-SF	Composite International Diagnostic Interview, Short Form
DICA	Diagnostic Interview for Children and Adolescents
DIS	Diagnostic Interview Schedule
DISC	Diagnostic Interview Schedule for Children
DSM	Diagnostic and Statistical Manual of Mental Disorders
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, fourth edition
DSM-III-R	Diagnostic and Statistical Manual of Mental Disorders, third edition, revised
DSM-III	Diagnostic and Statistical Manual of Mental Disorders, third edition
ECA	Epidemiological Catchment Area Study
GAF	Global Assessment of Functioning
GHQ	General Health Questionnaire
GHQ-36	The 36-item version of the General Health Questionnaire
ICD	International Classification of Diseases
ICD-10	International Classification of Diseases, tenth edition
K-SADS	Kiddie-SADS; children´s version of the Schedule for Affective Disorders and Schizophrenia
LEAD	Longitudinal, Expert, All Data

M-CIDI	The Munich-Composite International Diagnostic Interview
MDD	Major depressive disorder
MDE	Major depressive episode
NAM	Nuorten Aikuisten Mielenterveys (Mental Health of Young Adults)
NCS	National Comorbidity Survey
NOS	Not otherwise specified
OR	Odds ratio
PTSD	Posttraumatic stress disorder
PSE	Present State Examination
RDC	Research Diagnostic Criteria
SADS	Schedule for Affective Disorders and Schizophrenia
SCAN	Schedules for Clinical Assessment of Neuropsychiatry
SD	Standard deviation
UKKI	The Uusikaupunki-Kemijärvi Study
WHO	World Health Organization

1 ABSTRACT

Late adolescence and early adulthood are key risk periods for onset of depression and several other mental disorders. These disorders are often comorbid and tend to associate with significant psychosocial dysfunctioning. Research data on mental disorders, their comorbidity, related impairment, psychiatric treatment need and use, as well as issues dealing with early identification of mental disorders among young people are thus of vital importance.

The present thesis investigated epidemiology of mental disorders in a follow-up sample of young adults from general population, focusing particularly on depressive disorders. Subjects were 706 20-24-year-olds who five years earlier had taken part in a baseline study while being high-school students in Helsinki and Jyväskylä regions. The two-stage follow-up in 1995 comprised a postal questionnaire, with 651 subjects responding, and clinical interviews for a selected subgroup of 245 respondents. Diagnostic case ascertainment based on semistructured psychiatric SCAN interviews (Schedules for Clinical Assessment of Neuropsychiatry), with DSM-IV diagnoses set by consensus.

The prevalence of any current mental disorder was 23.8% (20.2% in males and 26.1% in females) according to DSM-IV criteria; the overall prevalence dropped to 10.3% when clinically significant impairment was required for diagnosis. Depressive disorder was the most common disorder in both sexes, followed by anxiety disorders, substance use disorders, and personality disorders. Current and 12-month prevalences of major depression were 6.9% and 12.3%; with impairment criteria the corresponding rates were 3.7% and 7.3%. Dysthymia (current and 12-month) was discovered in 3.9% of subjects (3.0% and 3.4% with impairment criteria). Major depression and dysthymia were two to more than three times more common among females.

Of subjects with any psychiatric disorder, 35% had at least two current disorders; of those with current major depression or dysthymia, 59% had another current disorder. Comorbidity was associated with more severe impairment and treatment need.

One third of subjects with any current DSM-IV disorder and half of those with a current depressive disorder had contacted mental health services at some phase during their current episode, and ongoing treatment contact was reported by less than one fifth. The effect of comorbidity was more evident than that of impairment in determining treatment seeking. Females reported previous treatment contacts and intention to seek help more often than males. Contacts during the index episode of depression were, however, about equally prevalent among both sexes.

The applicability of the CIDI-SF (the World Health Organization Composite International Diagnostic Interview Short-Form), a brief, highly structured instrument to detect major depressive episodes, was evaluated using consensus diagnoses based on SCAN as a standard. The correspondence between the two instruments was modest, but better when the comparison was with a broader category of affective disorders.

Finally, the predictive impact of self-reported depressive symptoms in adolescence on early adulthood mental health was examined. Depressive symptoms in adolescence appeared to predict early adulthood depressive disorders, comorbidity, psychosocial impairment, and problem drinking.

In conclusion, the present study found mental disorders in young Finnish adults to be common, impairing, highly comorbid, and seriously undertreated. The study provides further evidence for using impairment in psychological functioning as an additional diagnostic criteria to differentiate clinically significant disorders from less severe ones. Proper assessement of comorbidity in both clinical practice and research is emphasized. The findings also support the use of a comprehensive, clinical-like interview instrument rather than brief measures in producing reliable diagnoses of major depression. Finally, adolescent depressive symptoms deserve attention as a potential risk for early adulthood mental disorders.

2 LIST OF ORIGINAL PUBLICATIONS

This thesis is based on the following original publications, which are referred to in the text by Roman numerals I-IV.

I. Aalto-Setälä T, Marttunen M, Tuulio-Henriksson A, Poikolainen K, Lönnqvist J. One-month prevalence of depression and other DSM-IV disorders among young adults. Psychological Medicine 2001;31:791-801.

II. Aalto-Setälä T, Marttunen M, Tuulio-Henriksson A, Poikolainen K, Lönnqvist J. Psychiatric treatment seeking and psychosocial impairment among young adults with depression. Journal of Affective Disorders 2002; 70: 35-47.

III. Aalto-Setälä T, Haarasilta L, Marttunen M, Tuulio-Henriksson A, Poikolainen K, Aro H, Lönnqvist J. Major depressive episode (MDE) among young adults: CIDI-SF versus SCAN consensus diagnoses. Psychological Medicine 2002; 32:1309-1314.

IV. Aalto-Setälä T, Marttunen M, Tuulio-Henriksson A, Poikolainen K, Lönnqvist J Depressive symptoms in adolescence as predictors of early adulthood depressive disorders and maladjustment. American Journal of Psychiatry 2002; 159:1235-1237.

3 INTRODUCTION

Epidemiology studies the occurrence of illnesses in the general population, need for treatment, and functional incapability caused by these illnesses, as well as factors that influence or associate with disease occurrence. Data on the occurrence of disorders and associated treatment needs (descriptive epidemiology) are an essential component in developing public policy for the provision of mental health and other services, including effective targeting of already existing treatment resources. On the other hand, research data on possible backgroud factors of disorders (analytical epidemiology) provide information on the etiology, pathogenesis and risk factors of disorders (Lehtinen and Joukamaa, 1994).

No other disorders are as common and impairing, have such an early onset, and affect such a large proportion of the whole life course as mental disorders. Young people in their transition to adulthood particularly suffer from mental disorders, since late adolescence and early adulthood are the stages of life devoted to making major choices in multiple life spheres.

Depression is one of the most common mental disorders among adolescents and adults. To date, epidemiological research on depression in youth is vivid but was long hampered by two major misconceptions: that adult-like depressions among young people are rare or even non-existent, and that such mood disturbance is a normal and self-limiting developmental feature (Offer et al., 1992; Harrington, 2001; Kessler et al., 2001). Existing research data make it clear that this is not the case. Indeed, depression seems to be relatively common among adolescents, is particularly prevalent in late adolescent and early adulthood years, shows an increasing trend especially in younger birth cohorts, often persists into adulthood and causes a range of adverse psychiatric and psychosocial consequences including personal, social, and financial costs (Harrington et al., 1990; Newman et al., 1996; Kessler and Walters, 1998). There is also a clear association between depression in youth and suicide (Marttunen et al., 1991, Rao et al., 1993; Harrington et al., 1994; Harrington, 2001). Yet, depression and other mental disorders seem to be seriously underdetected and

undertreated among young people, only approximately one third of those disturbed reporting treatment contacts (Newman et al., 1996; Wittchen et al., 1998; Kessler et al., 1999). Prevalence data on depression and other mental disorders, treatment need and use due to these disorders, and their distinctions among young adults are thus of vital concern, as are identification of factors that associate with increased risk of these disorders, and evaluation of instruments to aid early detection of possible psychopathology.

The study project Nuorten Aikuisten Mielenterveys (NAM) (Mental health of young people) was started up at the National Public Health Institute in 1994 to study various aspects of Finnish young adults´ mental well-being, substance use, and current life situation. The NAM follow-up study sample comprised 20-24-year-old former high-school students from Helsinki and Jyväskylä regions, investigated earlier in 1990 by a questionnaire. Until now, reports of the NAM-study have dealt with substance use, mental distress, somatic symptoms, and psychological maturation (Tuulio-Henriksson et al., 1997; Pitkänen, 1999; Poikolainen et al., 2000; Tuulio-Henriksson et al., 2000; Poikolainen et al., 2001a; Poikolainen et al., 2001b; Aalto-Setälä et al., 2002*)*. A comprehensive study report on the design and methods of the NAM-study has been published (Poikolainen et al., 1997). Reports on the baseline study phase have considered diverse psychological issues in adolescents (Poikolainen et al., 1994; Poikolainen et al 1995a, Poikolainen et al., 1995b; Poikolainen et al., 1998; Anttila et al., 2000; Poikolainen et al., 2000b).

4 REVIEW OF THE LITERATURE

4.1 From adolescence to adulthood

Adolescence begins at puberty around age 12 and usually finishes around age 21 when a gradual shift to adulthood takes place (Marttunen and Rantanen, 2001). It is a time of rapid physiological and psychological changes, cognitive maturation, and of intensive readjustment to the family, school, work and social life and of preparation of adult roles.

Adolescence has been viewed as a continuous adjustment process to puberty (Blos, 1979). The process of separation from family influences the development of an identity in a profound way and recapitulates the separation-individuation phase of early childhood; Blos (1979) has indeed described adolescence as ”the second individuation process”. Laufer (1975) has characterized adolescence as a time when uncertainties, new feelings and anxieties, and new perception of self and others are experienced as part of the pressure to move towards adulthood and as part of giving up the safety and dependency of childhood. According to Erikson (1968), the major psychosocial task of adolescence is the formation of an identity, which takes place along a sequelae of developmental tasks that have to be solved one by one, unaccomplished tasks persisting as problems in subsequent developmental stages. The primary task to be solved in adolescence is that of identity versus confusion: the sustained separation from social, residential, economic, and ideological dependence on one´s family of origin. In early adulthood the primary developmental task is that of intimacy versus isolation, serving as the gateway to adult development (Erikson, 1968).

Three overlapping biopsychosocial phases have been distinguished within adolescence: early, middle and late adolescence (Marttunen and Rantanen, 2001). In addition to the physical changes of puberty, growth spurt and development of secondary sex characteristics, early adolescence is characterized by greater social separation from parents and family, and greater affinity with peers. Distinctive for

middle adolescence are consolidation of sense of self, increased sexual experimentation, and decreased sense of threat from adults. Late adolescence is the time of taking adult-like responsibilities and perspectives which require decisions about educational and occupational goals, leaving home, and romatic relationships and commitments. Adolescent development is a continuous process from one stage to another, and individual changes at each stage may be substantial.

Adolescence was long considered as a time of storm and stress until research began to indicate that emotional chaos is not a developmental necessity for a successful transition from childhood to adulthood (Skodol et al., 1997). Offer (1969) found that majority of adolescents display relatively little turmoil, and that despite their increasing attachment to peers, adolescents are still most powerfully attached to their parents. Based on the Isle of Wight study data, Rutter et al. (1976) reported that although adolescents often feel more misery than is noticed by parents and other adults, the degree of turmoil and its psychiatric importance had been exaggerated in earlier research. These findings opened the way to a more empirically driven view of adolescent development. From a clinical viewpoint, the concept of adolescence as a period demanding completion of many phase-specific developmental tasks is valuable because the sequental nature of these tasks forms a useful frame of reference in assessment and treatment of adolescent psychopathology.

Research has documented the prevalence of mental disorders in general and depression in particular to culminate in late adolescence and early adulthood (Newman et al., 1996; Kessler and Walters, 1998). Compared to adult populations, disorders occurring during the transition are mostly at their initial stage. Therefore, research on mental disorders during the transition to adulthood provides data not only for public health purposes, but also offers a unique possibility to study mental disorders at an early stage, before more serious complications are present.

4.2 Definition of a mental disorder

Mental disorders have been defined by a variety of criteria; there is no universally accepted definition of the concept of "mental disorder". The DSM-IV (APA, 1994) attains a descriptive and etiologically atheoretical viewpoint in defining mental disorder: "Each of the mental disorders is conceptualized as a clinically significant behavioural or psychological syndrome or pattern that occurs in a person and that is associated with present distress (e.g., a painful syndrome) or disability (i.e., impairment in one or more important areas of functioning) or with a significantly increased risk of suffering death, pain, disability, or an important loss of freedom. In addition, this syndrome or pattern must not be merely an expectable response to a particular event, e.g., the death of a loved one. Whatever its original cause, it must currently be considered a manifestation of a behavioural, psychological, or biological dysfunction in the person. Neither deviant behaviour (e.g., political, religious, or sexual) nor conflicts that are primarily between the individual and society are mental disorders unless the deviance or conflict is a symptom of a dysfunction in the individual, as described above" (APA, 1994).

In the DSM-IV, there is no assumption that each category of mental disorder would be a completely discrete entity with clear boundaries dividing it from other mental disorders or from no mental disorder, or that individuals sharing the same mental disorder would be alike. When applying a categorical approach to define a mental disorder, individuals diagnosed with a same disorder are likely to be heterogeneous even in regard to the defining features of the diagnosis. Such a common language is, however, vital for the purposes of studying, communicating about, and treating persons distressed by these dysfunctions. Finally, it is emphasized that classification of mental disorders classifies disorders that people have, not people (APA, 1994).

4.3 Definition of depression

Depression can be seen as a state of mood relating to e.g. loss events or disappointments, as such common to everybody. It may also manifest itself as a

special symptom in different mental or somatic disorders, as part of a syndrome measured by depression rating scales, or as a clinical diagnosis operationalized by diagnostic classification systems (Lehtinen and Joukamaa, 1994). As is the practice of contemporary psychiatric epidemiological research, depression as follows is conceptualized according to the DSM-IV diagnostic classification (APA, 1994).

4.3.1 Major depressive disorder

According to the DSM-IV (APA, 1994) classification, the essential feature of major depressive disorder is the clinical course characterized by one or more major depressive episodes without a history of manic, mixed, or hypomanic episodes. The diagnosis of major depressive episode requires a two-week period of either depressed or irritable mood or loss of interest or pleasure, and at least four other symptoms, which may include significant weight loss or gain, appetite disturbance, insomnia or hypersomnia, psychomotor agitation or retardation, fatigue or loss of energy, feelings of worthlessness, inappropriate guilt, impaired concentration, recurrent suicidal ideas, or suicidal attempt. By definition, the episodes must not be accounted for by schizoaffective disorder and are not superimposed on schizophrenia, schizophreniform disorder, delusional disorder, or psychotic disorder not otherwise specified. The episode of major depression may present as single (used only for first episodes) or recurrent. An episode is considered to have ended when the full criteria for the major depressive episode have not been met for at least two consecutive months (APA, 1994).

4.3.2 Dysthymia

Dysthymic disorder is a chronic disturbance of mood that occurs for most of the day more days than not for at least two years. In children and adolescents, the mood may be irritable rather than depressed, and the required minimum duration is one year. During periods of depressed mood, at least two of the following additional symptoms are present: poor appetite or overeating, insomnia or hypersomnia, low energy or fatigue, low self-esteem, poor concentration or difficulty making decisions, and

feelings of hopelessness. During the two-year period (one year for children and adolescents), any symptom-free intervals last no longer than two months. The diagnosis of a dysthymic disorder can only be made if the initial two-year period of dysthymic symptoms (one year in children and adolescents) is free of major depressive episodes. If a person has had dysthymia for two years and then has an episode of major depression in addition to the underlying dysthymic disorder, “double depression” is diagnosed. Once the person returns to a dysthymic baseline and no longer meets criteria for a major depressive episode, only dysthymic disorder is diagnosed (APA, 1994).

4.3.3 Depressive disorder NOS

The “depressive disorder not otherwise specified” category includes disorders with depressive features that do not meet the criteria for major depressive disorder, dysthymic disorder, adjustment disorder with depressed mood, or adjustment disorder with mixed anxiety and depressed mood. This category comprises e.g. depressive conditions characterized by episodes of at least 2 weeks of depressive symptoms but with fewer than the five symptoms required for major depressive disorder (APA, 1994).

4.3.4 Adjustment disorder with depressed mood

The essential feature of an adjustment disorder is a psychological response to an identifiable stressor or stressors that results in the development of clinically significant emotional or behavioural symptoms. The symptoms must develop within three months after the onset of the stressor(s). The clinical significance of the reaction is indicated either by marked distress that is in excess of what would be expected given the nature of the stressor or by significant impairment in social or occupational (academic) functioning. This category is not used if the disturbance meets the criteria for another specific Axis I disorder or is merely an exacerbation of a preexisting Axis I or II disorder, or when the symptoms represent bereavement. By definition, the

adjustment disorder must usually resolve within 6 months of the termination of the stressor or its consequences (APA, 1994).

Diagnosis of “adjustment disorder with depressed mood” is used when the predominant manifestations are symptoms such as depressed mood, tearfulness, or feelings of hopelessness. The diagnosis of “adjustment disorder with mixed anxiety and depressed mood” refers to a condition where the predominant manifestation is a combination of depression and anxiety (APA, 1994).

4.4 Diagnostic evaluation of mental disorders in epidemiological studies

The contemporary psychiatric epidemiology relies on use of standardized diagnostic instruments together with operationalized diagnostic criteria. Both were developed in parallell in the US and UK. The first operational criteria were incorporated in the Research Diagnostic Criteria (RDC) (Spitzer et al., 1978), and the first instrument to rely on these criteria was the Schedule for Affective Disorders and Schizophrenia (SADS) (Endicott and Spitzer, 1978).

The RDC were superceded by the International Classification of Diseases (ICD) and developed by the World Health Organization (WHO), while the Diagnostic and Statistical Manual of Mental Disorders (DSM) was developed by the American Psychiatric Association (APA). The most recent versions of each system are the ICD-10 (WHO, 1992) and the DSM-IV (APA, 1994). A common feature in both systems is that symptoms and behavioural signs are used to classify subtypes of disorders and functional impairment. While DSM-IV provides only one set of diagnostic criteria for clinical and research purposes, ICD-10 has separated clinical and research criteria. Furthermore, in contrast to the ICD-10, the DSM-IV is a multiaxial system with separate axes for personality diagnoses (Axis II), somatic disorders (Axis III), psychosocial stressors (Axis IV) and psychosocial functioning (Axis V). Finally, ICD-10 and DSM-IV have somewhat different approaches to comorbidity: for example, in the ICD-10, the diagnosis of mixed anxiety and depressive disorder,

classified as an anxiety disorder, is made when both anxiety and depressive symptoms are prominent but not to the extent to fulfil criteria for a specific mood or anxiety disorder. In the DSM-IV, these subjects would be likely to be diagnosed to suffer from two separate disorders.

There are two main traditions of interview approach. The other tradition relies on interviewer-based interviews which provide only general guidelines for conducting the interview. This approach has being used in the Present State Examination (PSE) (Wing et al., 1974) which was further developed as the SCAN interview (Schedules for Clinical Assessment of Neuropsychiatry) (WHO, 1994). Such interviews seek to obtain detailed descriptions of behaviour, which are then coded by the interviewer using pre-specified diagnostic criteria. As the structure of these interviews resides more in the concepts than in the questions, they are aimed to interviewers experienced in clinical psychiatry.

By contrast, highly structured interviews minimize the role of clinical inference in the assessment process by using predetermined standardized questions that usually require only a “yes/no” response. The exact order, wording and coding of each item is specified. Such interviews can be regarded as respondent-based to the extent that the decision as to whether or not the criterion is met is essentially left to the interviewee. These interviews are cost-effective as they may be conducted by lay interviewers, but are thereby exposed to miss data beyond the range of the standard enquiry. Examples of the latter type are the Diagnostic Interview Schedule (DIS) (Robins et al., 1981), and its descendant, the Composite International Diagnostic Interview (CIDI) (WHO, 1990).

Both approaches have their benefits and disadvantages; no single instrument has emerged as superior to all purposes. The balance between sensitivity and specificity of an interview is often the major determinant of the choice of the diagnostic instrument. In general, structured interviews focus on sensitivity and apply lower diagnostic thresholds while semistructured interviews focus on specificity and use higher diagnostic thresholds. Ideally, an interview would have both high sensitivity and high specificity for a disorder. As no such instrument exits, the choice of an instrument depends on the setting and purpose of the study; different instruments are

not intended to compete with each other but rather to be complementary (Brugha et al., 1999a; Wittchen et al., 1999).

As for diagnosing depression, contemporary epidemiological surveys usually conceptualize depression as a diagnosis, based on the criteria on diagnostic systems such as DSM-IV (APA, 1994) or ICD-10 (WHO, 1992), data collection relying on structured or semistructured diagnostic instruments. Additionally, there are several rating scales designed to ascertain depressive symptoms, also those designed specifically for young people (Myers and Winters, 2002). Their value in obtaining estimates of symptom prevalence in the population and for screening purposes is well established. They may also aid in case detection in clinical settings, in studying the nature of depressive psychopathology further and in measurement of changes during the course of treatment. These scales tend to produce relatively low sensitivity and specificity values, with some exceptions; e.g. the study by Lasa et al. (2000) reported high sensitivity and specificity rates for Beck´s Depression Inventory (BDI) (Beck et al., 1961) in a non-clinical adult sample. The scales are not, however, designed to yield diagnoses, and since they generally have low specificity and sensitivity, they do not substitute standard methods of making categorical diagnoses of depression (Kessler et al., 2001; Myers and Winters, 2002).

4.5 Prevalence of mental disorders in adolescence and early adulthood

Recent studies have documented prevalence of mental disorders to increase from childhood through adolescence and to peak in young adulthood, thereafter gradually declining with age (Kessler et al., 1994; Newman et al., 1996). Increasing rates of psychopathology in more recent age cohorts have also been suggested (Robins and Regier, 1991; Klerman and Weissman, 1992; WHO, 2000).

Table 1 summarizes selected studies on adolescent and young adult study samples. Only studies in non-clinical samples with age-range from mid-adolescence upwards are considered, with preference given to recent investigations in which operational

psychiatric diagnostic criteria and systematic evaluation were used. Therefore, study on early adolescents by Garrison et al (1992) is excluded as are studies on mixed child-adolescent samples (e.g. Offord et al., 1987; Bird et al., 1988; Jensen et al., 1995; Costello et al., 1996; Shaffer et al., 1996; Simonoff et al., 1997; Steinhausen et al., 1998) since subjects in these samples may represent very different developmental stages. To further facilitate the comparison between studies, only current to 12-month prevalence estimates are shown in Table 1. The definitions of mental disorder in these studies are based on the DSM-III (APA, 1980), DSM-III-R (APA, 1987) or DSM-IV (APA, 1994).

Generally, in early adolescence, a larger proportion of males than females are diagnosed to have mental disorders, whereas females are in majority from mid-adolescence upwards (Skodol et al., 1997). Mixed child-adolescent samples (not in Table 1) have yielded 3-to 6-month prevalences of about 14-34% for any psychiatric disorder (Offord et al., 1987; Bird et al., 1988; Jensen et al., 1995; Costello et al., 1996; Shaffer et al., 1996; Simonoff et al., 1997; Steinhausen et al., 1998). In mid- to mid-late adolescent samples, adolescent-reported current to six-month prevalences have ranged between 9.6% and 25% (Kashani et al., 1989; Velez et al., 1989; McGee et al., 1990; Fergusson et al., 1993; Lewinsohn et al., 1993; Gomez-Beneyto et al., 1994; Verhulst et al., 1997), and a lifetime prevalence of 49.1% has been reported (Reinherz et al., 1993a). Among late adolescents and young adults, a current prevalence estimate of 16.9% (Regier et al., 1993), 6-month estimate of 10.2% (Canino et al., 1987) and 12-month prevalences of 36.6-40.4% (Feehan et al., 1994; Newman et al., 1996) have been found. A lifetime prevalence (i.e. cumulative incidence) of 39.0% was reported in the mixed adolescent-young adult sample by Wittchen et al (1998).

While conduct and attention deficit disorders distinguish as the most prevalent disorders in early adolescence, anxiety, mood disorders and substance use disorders form the major part of the disorder spectrum in mid- and late adolescence (Kashani et al., 1987a; Kashani et al., 1989; McGee et al., 1990; Fergusson et al., 1993; Lewinsohn et al., 1993; Verhulst et al., 1997).

Relatively little information is available on the extent and nature of psychopathology specifically of young adults. The three reportedly most prevalent disorders on current- to 12-month time-frames have been major depression with prevalences of 2.2% (Regier et al., 1993), 2.6% (Canino et al., 1987), 16.7% (Feehan et al., 1994) and 16.8% (Newman et al., 1996), anxiety disorders with prevalences 5.9% (Canino et al., 1987), 7.7% (Regier et al., 1993), 23.8% (Feehan et al., 1994) and 31.5% (Newman et al., 1996), and substance use disorders with prevalences of 3.5% (comprising only alcohol abuse and dependence) (Canino et al., 1987), 6.8% (Regier et al., 1993), 15.6% (Feehan et al., 1994) and 19.5% (Newman et al., 1996).

Regarding Finnish young adults, broad-based diagnostic information on mental disorders and treatment needs have so far been missing. Earlier large-scale epidemiological studies have provided data on prevalence of mental disorders in adults aged over 30 years (The Mini-Finland Health Survey) (Lehtinen et al., 1990a), in a follow-up sample of originally 15-64-year-olds (UKKI Study) (Lehtinen et al., 1990b), and among 8-9-year-old children (Almqvist et al., 1999). The Mini-Finland Health Survey reported a prevalence of any current mental disorder of 17.4% and UKKI Study 9.9% for adults aged 30 years or older; in a general population sample of 8-9-year-olds, 21.8% were diagnosed as having a psychiatric disorder basing on parental interview data (Lehtinen et al., 1990a; Lehtinen et al., 1990b; Almqvist et al., 1999).

By early adulthood, majority of the mental disorders seen in adults have already emerged. Newman et al. (1996) reported nearly three fourths (73.8%) of the Dunedin follow-up study members diagnosed at age 21 to have been previously diagnosed during adolescence; in that study the incidence rate of new disorders among subjects previously undiagnosed at ages 11, 13, 15 or 18 years was only 10.6%. Mental disorders occurring during the transition to adulthood thus offer a unique opportunity to study adult mental disorders in their early forms.

Table1: Current to 12-month prevalences of mental disorders in adolescent and young adult samples

Study reference	Canino et al.	Kashani et al.	Velez et al.	McGee et al.	Cohen et al	Fergusson et al
Study year	1987	1989	1989	1990	1993	1993
N interviewed	295	150	456	943	A:508; B:446	961
Age	18-24	14-16	15-20	15	A:14-16; B:17-20	15
Population	general	general	general	general, birth-cohort (Dunedin Study)	general	general, school-based
Interview instr.	DIS	DICA	DISC	DISC	DISC	DISC
Informant(s)	adolescent	adolescent, parent	adolescent, mother	adolescent, parent	adolescent, parent	adolescent, mother
Diagnostic criteria	DSM-III	DSM-III and impairment	DSM-III-R with severity crit.	DSM-III-R severity	DSM-III-R	DSM-III-R
Time-frame	6-month	current	current	current	current	current
Prevalences: Major depression	2.6%	4.7%*	3.1%**	1.2%*	A:7.6%, B:2.7%	0.7%**
Dysthymia	0%	3.3%*	-	1.1%*	-	0.4%**
Any psychiatric disorder	10.2%	18.7%* m 16.0%, f 21.3%	16.0%**	22.0%* m 18.2%, f 25.9%	-	22.1%**

Study reference	Lewinsohn et al.	Regier et al.	Reinherz et al.	Feehan et al.	Gomez-Beneyto et al.	Newman et al.
Study year	1993	1993	1993	1994	1994	1996
N interviewed	1710	2256	386	930	107	961
Age	14-18	18-24	mean 17.9	18	15	21
Population	general, school-based	general (ECA)	general	general, birth-cohort (Dunedin Study)	general	general, birth cohort (Dunedin Study)
Interview instr.	K-SADS	DIS	DIS	DIS	K-SADS (2-stage)	DIS
Informant(s)	adolescent	adolescent	adolescent	adolescent	adolescent	adolescent
Diagnostic criteria	DSM-III-R	DSM-III	DSM-III-R	DSM-III-R and impairment	DSM-III-R	DSM-III-R and impairment
Time-frame	current	current	current	12-month	current	12-month
Prevalences: Major depression	2.6% m 1.7%, f 3.4%	2.2%	2.9%	16.7% m 12.0%, f 21.8 %	2.5% (depressive disorder)	16.8% m 11.2%, f 22.6%
Dysthymia	0.5%	0%	-	3.2%	not specified	3.0%
Any psychiatric disorder	9.6% m 7.8%, f 11.2%	16.9%	-	36.6% m 31.1%, f 42.3%	13.6% m 10.8%, f 16.3%	40.4% m 38.6%, f 42.4%

Study reference	Verhulst et al	Kessler and Walters	Wittchen et al.	Oldehinkel et al.	Olsson and von Knorring	Haarasilta et al.
Study year	1997	1998	1998	1999	1999	2001
N interviewed	780	1769	3021	1228	251	C:509; D:433
Age	13-18	15-24	14-24	14-17	16-17	C:15-19; D:20-24
Population	general	general (NCS)	general	general	general school-based	general
Interview instr.	DISC	UM-CIDI	M-CIDI	M-CIDI	DICA	CIDI-SF
Informant(s)	adolescent, parent	adolescent	adolescent	adolescent	adolescent	adolescent
Diagnostic criteria	DSM-III-R	DSM-III-R	DSM-IV	DSM-IV	DSM-III-R	DSM-III-R
Time-frame	6-month	12-month	12-month	12-month	12-month	12-month
Prevalences: Major depression	2.8%**	19-20 yrs 4.7%; 21-22 yrs 7.7%; 23-24 yrs 2.9%	5.3% m 3.3%, f 7.2%	3.4% m 2.4%, f 4.5 %	5.8% m 2.3%, f 9.2%	C: 5.3%; D: 9.4%
Dysthymia	1.5%**	-	2.9%	1.6%	2%	-
Any psychiatric disorder	21.5%**	-	17.5% (without SUD) SUD 11.4%	-	-	-

* adolescent report with parent-confirmed caseness, **adolescent report, m=males, f=females, A=study group of 14-16-year-olds, B=study group of 17-20-year-olds, C=study group of 15-19-year-olds, D=study group of 20-24-year-olds

4.5.1 Prevalence of depression

4.5.1. 1 Major depression

The reported prevalence estimates of major depression have ranged from 0.4% to 2.5% in children and from 0.4% to 8.3% in adolescents (Birmaher et al., 1996). Lifetime prevalences of major depression in late adolescent or young adult samples have ranged from 3.6% to 24.0 % (e.g. Canino et al., 1987; Lewinsohn et al., 1993; Kessler et al., 1994; Wittchen et al., 1998; Oldehinkel et al., 1999; Olsson et al 1999), the 12-month prevalences from 3.4 % to 16.8 % (Fergusson et al., 1993; Kessler et al., 1994; Newman et al., 1996; Wittchen et al., 1998; Oldehinkel et al., 1999; Olsson et al., 1999), and point prevalences from 0.7 % to 6.1% (e.g. Fergusson et al., 1993; Regier et al., 1993; Reinherz et al., 1993a; Blazer et al., 1994). Among adults, lifetime estimates of major depression of 10-25% for females and 5-12% for males, and point prevalences of 5-9% for females and 2-3% for males are reported (APA, 1994). The reported adult prevalences are very similar to those among late adolescents and young adults, indicating that depression in adults often begins in adolescence.

While prevalence estimates base on numbers of persons with the disorder in a defined time period, incidence rates relate to the development of new cases or episodes of the disorder within a given period. Incidence of major depression in adolescence has been estimated in only few general population studies. One-year incidences of 3.3% among early-and mid-adolescents (Garrison et al., 1997), and 3.4% and 5.7% among mid-adolescents (Lewinsohn et al., 1993; Oldehinkel et al., 1999) for major depression have been reported. The cumulative incidence (lifetime prevalence) by age 18 years is reportedly around 20% in community samples (Lewinsohn et al., 1993). In the Dunedin birth cohort 70.2% of those diagnosed with major depression at age 21 were already diagnosed in previous assessments (Newman et al., 1996).

Of previous Finnish adult studies, both the Mini Finland Health Survey (Lehtinen et al., 1990a) and the UKKI study (Lehtinen et al., 1990b) have found current age-adjusted prevalences of any depressive disorder, assessed by the PSE, to be 4.6%. Specific prevalence rates for major depressive episode (MDE) in general population

samples as measured by the CIDI-SF (Composite International Diagnostic Interview Short Form) have been reported by Isometsä et al (1997) with a 6-month rate of 4.1% among adults aged 25-29 years, and in another study sample by Lindeman et al. (2000) with a total MDE prevalence of 9.3% among individuals aged 15-75 years, and by Haarasilta et al (2001) with 12-month MDE rates of 5.3% and 9.4% among subsamples of 15-19-year-olds and 20-24-year-olds, respectively. Preliminary data from the Health 2000 Study revealed 5% of adults from general population aged 30 years or more to have suffered from a major depressive episode during the past 12 months, as measured by the CIDI-interview (Aromaa and Koskinen, 2002). Of 8-9-year-old children, 6.2% were diagnosed as depressed based on parental interviews (Almqvist et al., 1999).

4.5.1.2 Dysthymia

The few epidemiological studies on dysthymic disorder have reported a point prevalence of 0.6-1.7% in children and 1,6-8.0% in adolescents (Birmaher et al., 1998). Among young adults, current to 12-month rates of 2.2-3.2% (Regier et al., 1993; Feehan et al., 1994; Newman et al., 1996) and lifetime rate of 4.7% (Canino et al., 1987) are reported. One-year-incidences of 1.1% (Oldehinkel et al., 1999) and 0.1% (Lewinsohn et al., 1993) among mid-adolescents are documented. In the Dunedin sample all 21-year-old subjects with dysthymia were already diagnosed in previous assessments (Newman et al., 1996). Among adults the lifetime prevalence of dysthymic disorder is approximately 6%, and point prevalence 3% (APA, 1994); Isometsä et al. (1997) reported a prevalence rate of 1.7% for current dysthymia in a non-clinical Finnish adult sample. In children dysthymia is equally prevalent in both sexes; in older samples females are diagnosed dysthymia 2-3 times more often than males (APA, 1994). It has been estimated that approximately 70% of youth with early-onset dysthymia will subsequently develop an episode of major depression, resulting in double depression (APA, 1994).

4.5.1.3 Adjustment disorders with depressed mood

Adjustment disorders are among the most common psychiatric diagnoses in adolescents (Greenberg et al., 1995). In contrast to adult samples which show female preponderance, child and adolescent clinical samples show about equal rates of these disorders in both sexes (APA, 1994). The prevalence of an adjustment disorder of any type has reportedly ranged between 2% and 8% in non-clinical child and adolescent samples and among the elderly (APA, 1994).

4.5.2 Interpretation of prevalence estimates

Earlier studies agree in finding prevalence rates for mental disorders to be high, especially among older adolescents and young adults. A major controversy concerning prevalence data is the large variability of prevalence estimates of individual disorders across studies. Indeed, several methodological issues are encountered when comparing prevalence rates of mental disorders between studies.

4.5.2.1 Use of clinical significance criteria in case ascertainment

Epidemiologic studies have consistently found rates of mental illness that far exceed the rates of mental health service use, raising the question of how many of the disorders meeting diagnostic criteria relate to such functional impairment that warrants treatment. From public health point of view, more important than plain data on prevalences of disorders are data on the prevalence of associated treatment needs in the population. Producing prevalence data that would serve as a proxy for treatment need is considered a major challenge for general population studies, where many subjects have symptomatology close to the threshold of a diagnosis (Frances, 1998; Narrow et al., 2002).

In the DSM-IV, the criteria sets for majority of disorders include a clinical significance criterion (worded as "… causes clinically significant distress or

impairment in social, occupational, or other important areas of functioning”). This criterion aims to help to establish the diagnostic threshold in situations in which the symptom presentation by itself (especially in milder forms of disorders) is not inherently pathological and may be encountered in individuals for whom a diagnosis of “mental disorder” would therefore be inappropriate (Frances 1998). Nevertheless, neither ICD nor DSM criteria are sufficiently explicit to provide clear guidelines regarding various classification distinctions, such as “clinically significant” impairment, or “marked distress” (Regier et al., 1998; Kessler et al., 2001).

Therefore, an increasing body of psychiatric epidemiological research has used also additional diagnostic criteria, such as the level of psychosocial impairment or need of psychiatric care, as a precondition for a diagnosis. Using additional criteria may, however, have a marked effect on prevalence estimates of disorders (Roberts et al., 1998). So far there is no consensus as to how clinical significance should be defined or operationalized, and the effect of the additional diagnostic criteria on prevalence estimates may remain obscure (Roberts et al., 1998; Narrow et al., 2002).

4.5.2.2 Other methodological discrepancies between studies

Compared to non-clinical samples, clinical samples tend give much higher prevalence rates for mental disorders (Angold, 1988; Pelkonen, 1997). This is particularly true as for rates of comorbidity, as comorbidity associates with treatment seeking (Lewinsohn et al., 1993; Kessler, 1995). Majority of earlier studies on comorbidity have been based on clinical samples, which have provided valuable information on different patterns of comorbidity and their response to treatment, but are not suitable to basic descriptive epidemiological research on this phenomenon (Kessler, 1995). Nevertheless, even non-clinical samples differ in their representativeness: for example, school-based samples may underestimate the rates of mental disorders since school dropouts and non-attenders are omitted (Fleming and Offord, 1990).

Sample sizes in studies may vary notably. In smaller samples the role of chance increases and the generalizability of the results decreases (Hennekens and Buring, 1987). Moreover, Fleming and Offord (1990) reported that in majority of studies response rates tend to be less than 75%. Yet many studies fail to report data on non-participants, although these data would be relevant to evaluate the representativeness of the study sample.

Most recent studies use standardized interview schedules relying on DSM- and ICD-criteria, which has led to greater uniformity across psychiatric epidemiology. While fully structured interviews may yield more consistent data across raters, the flexibility of semistructured instruments may produce higher validity. Generally, structured interviews tend to produce higher prevalence rates (Roberts et al., 1998).

Age range of the sample is important to note, as both occurrence and symptom presentation of disorders vary along development. For example, large age range of subjects may bias accurate reporting of the occurrence of major depression, as depression is reportedly rare before puberty but increases in prevalence shortly thereafter (Kovacs, 1996; Angold et al., 1998).

Epidemiologic evaluations of psychopathology among adults or older adolescents are almost always based exclusively on data gained by the interviewees themselves. Instead, samples including younger adolescents or children tend to use multiple informants, such as parents or teachers, in data collection (e.g. Kashani et al., 1989; Velez et al., 1989; McGee et al., 1990; Fergusson et al., 1993; Cohen et al., 1993; Verhulst et al., 1997). Although use of multiple informants is considered useful in producing diagnostic data among youth (Cantwell et al., 1997), there is uncertainty as to how the data from different informants should best be combined to yield diagnoses, and it may be impossible to estimate how data from various sources have affected prevalence rates in a particular study (Roberts et al., 1998). Among other possible sources of error is that psychopathology in informants may potentially bias reports of psychopathology in their relatives (Chapman et al., 1994). Strictly, prevalence estimates are comparable only if the rates are reported separately by informant.

Among other potential sources of discrepant reporting are differences in computation, as raw and weighted rates give slightly different figures, and use of pooled diagnostic categories: studies may e.g. combine major depression and dysthymia and not report separate rates for disorders. Additionally, use of different time-frames in studies, ranging from current to lifetime estimates, may hamper comparison. Reportedly, estimates for relatively chronic or recurrent disorders such as major depression do, however, not differ so much as to preclude the comparison on prevalence data on shorter and longer time-frames (Todd and Geller, 1995).

Finally, there is large cross-national variation in prevalence of depressive disorders, whereas the prevalence estimates of some other mental disorders (e.g. bipolar disorders, schizophrenia) show more uniformity across studies (Weissman et al., 1996; WHO, 2000; Simon et al., 2002). Possibly, social or environmental factors may have greater impact on depressive disorders than on more severe disorders, or depression measures are more difficult to apply across different cultures than are measures of bipolar or psychotic disorders (Simon et al., 2002). Recently, 15-fold variability in adult major depression prevalence was found in a large international multicentre survey, suggesting identical methodology to possibly identify different levels of depression severity in different countries or cultures (Simon et al., 2002).

4.6 Comorbidity in mental disorders

Comorbidity is said to exist when an individual with a disorder has an elevated prevalence of other disorders. “Current comorbidity” refers to the existence of two or more disorders in the same individual at a given time. The concept “lifetime comorbidity” implies that an individual with a history of mental disorder has presented an elevated prevalence of other disorders (Lewinsohn et al., 1991).

Comorbidity is common in both general population and clinical study samples, among youth as well as adults (Kessler, 1995). In general population samples, prevalences of comorbidity among children and adolescents have ranged from 40% to 70% (Angold and Costello, 1993; Kashani et al., 1987b; Rohde et al., 1991; Kovacs, 1996;

Biederman et al., 1995). Of young people with any comorbid disorder at least 20% to 50% are diagnosed two or more comorbid diagnoses (Birmaher et al., 1996). In non-clinical young adult samples, 12-month comorbidity rates of 46% and 47% in 18-and 21-year-olds are reported (Feehan et al., 1994; Newman et al., 1996). Adult general population data from the Epidemiological Catchment Area Study (ECA) (Robins and Regier, 1991) and the National Comorbidity Survey (NCS) (Kessler et al., 1994) have yielded lifetime comorbidity rates of 54% and 56%, correspondingly.

More specifically, among 18-year-olds, extensive overlap between depression, anxiety, substance dependence and conduct disorder has been found; among 21-year-olds the most overlap is reportedly between depression, anxiety and substance use disorders (Feehan et al., 1994; Newman et al., 1996).

In general, comorbidity can complicate treatment, lead to more severe or chronic illness course and more impairment, associate with increased likelihood of help-seeking and use of medications, associate with various social consequences and increased societal costs (Caron and Rutter, 1991; Kessler, 1995; Newman et al., 1996; Wittchen et al., 1998).

4.6.1 Psychiatric comorbidity in major depression

Approximately 40-90% of youth with major depression have other psychiatric disorders, with at least 20-50% presenting with two or more comorbid diagnoses (Birmaher et al., 1996). Rates of comorbidity among children and adolescents are similar to, or only slightly higher than rates in adults and the elderly (Rohde et al., 1991; Kovacs, 1996).

The patterns of comorbidity change as a function of age along the psychological development from childhood to adulthood (Anderson and McGee, 1994). Yet, the specific impact of age at onset of a disorder on the pattern of comorbidity is difficult to evaluate. In general, early-onset depressions are reported to associate with greater comorbidity than late-onset depressions (Alpert et al., 1999; Klein et al., 1999; WHO,

2000). The cohort effect with increased prevalence of disorders among younger age groups may, however, contribute to the higher prevalences of psychiatric comorbidity in younger age groups (Kessler et al., 1994; WHO, 2000), thus hampering comparison between samples from different calendar years. Moreover, adult samples comprise not only adult-onset disorders but also those having emerged in youth. Additionally, several methodological differences hamper the comparison between younger and older samples.

The most common co-occurring disorders among adolescents are dysthymia and anxiety (30-80% each), disruptive disorders (10-80%), and substance abuse (20-30%) (Birmaher et al., 1996), while among adults diagnosed with major depression, a high prevalence of anxiety disorders as well as alcohol and other substance abuse or dependence have been documented (Rohde et al., 1991; Kessler et al., 1995). Findings on the temporal order of disorders are contradictory. In most studies on youth, major depression is reported as being temporally secondary to other disorders (Kessler et al., 2001), with the possible exception of substance abuse (Biederman et al., 1995; Birmaher et al., 1996).

4.6.1.1 Effect of comorbidity on the course of major depression

In their 20-year follow-up of former depressed adolescents, Fombonne et al. (2001a) documented the risk of adult major depression to be equally increased in both comorbid and non-comorbid major depressions. Likewise, Lewinsohn et al. (1999) reported no differences between adolescent comorbid and non-comorbid major depressions in predicting early adulthood major depression. Individuals with a comorbid adolescent depression were, however, more likely than those with a non-comorbid depression to develop a nonaffective disorder in the future (Lewinsohn et al., 1999). Yet, findings on the effects of comorbidity on recovery from and recurrence of major depression are inconsistent (Warner et al., 1992; McCauley et al., 1993; Kovacs et al., 1997b). Instead, data have uniformly documented comorbidity to associate with more functional and clinical problems: greater severity and persistence of depressive symptoms (Birmaher et al., 1996; McCauley et al., 1993; Mitchell et al.,

1988; Anderson and McGee, 1994), higher rates of mental health service utilization (Fergusson et al., 1993; Lewinsohn et al.,1995), poor response to psychotherapy (Birmaher et al., 1996), increased risk of substance use (Birmaher et al., 1996), worse global functioning (Harrington et al., 1991; Lewinsohn et al., 1995), more social dysfunction (Goodyer et al., 1997) and more academic problems (Lewinsohn et al., 1995; Kovacs et al., 1997b). Additionally, adolescents with comorbid major depressions have shown poorer psychosocial functioning also after recovery from depression compared to adolescents with non-comorbid depressions (Pelkonen et al., 1997).

4.7 Psychiatric treatment seeking in mental disorders among youth

Early onset of disorders, their often chronic nature and tendency to comorbidity imply that many young people suffering from mental disorders are in need of clinical care. Still, research has indicated that the majority of those disturbed do not receive appropriate help (Offord et al., 1987; Whitaker et al. 1990; Lewinsohn et al., 1994; Wittchen et al., 1998).

Only a few studies as yet have provided service use data in general population during the transition from adolescence to adulthood (Canino et al., 1987; Robins and Regier, 1991; Newman et al.,1996; Kessler and Walters, 1998; Wittchen et al., 1998). Of the birth cohort of 21-year-olds from New Zealand (Newman et al., 1996) 25%, and of a mixed adolescent-adult sample in the NCS (Kessler et al., 1999) 17% reported some kind of outpatient contact for psychiatric problems, both studies providing 12-month service use rates for 12-month DSM-III-R disorders. In another study, almost half of 15-24-year-olds with any mental disorder had contacted a health professional, mostly a general practioner, because of their condition (Wittchen et al., 1998).

Psychiatric treatment seeking among Finnish youth has been scarcely studied. Hyttinen (1986) reported 7.5% of a cohort of 13-18-year-olds to have contacted mental health or child welfare services during years 1981-1982. Almqvist (1983) analysed prospective follow-up data of a birth cohort born in 1955: by age 14, 16%

had been registered in psychiatric out- or inpatient services. Of adolescents aged between 15 and 21, 7.2% of males and 10.1% of females had contacted psychiatric outpatient services, while incidence for inpatient referral was 2.9% among males and 2.6% among females (Almqvist, 1983). Hintikka et al. (2000) found 14% of non-clinical 18-22-year-olds revealing mental distress based on the General Health Questionnaire (Goldberg, 1972) to have contacted mental health services during the past 12 months.

There seems to be an inverse relationship between age at onset of the disorder and probability of treatment contact, early onset relating to less treatment use and long delays in obtaining treatment (Kessler et al., 1998b; WHO, 2000). In general, there is a considerable delay in receiving treatment after making the initial contact: data from the adult population of the NCS revealed a tendency of a delay of averaging from 6 to 14 years; only a minority of those with a psychiatric disorder received professional treatment within a year from their initial treatment contact (Kessler et al., 1998b).

Majority of treatment contacts among adolescents are initiated by adults or peers around them (Pelkonen, 1997; Lukkari et al., 1998). The low treatment referral in early-onset disorders may indicate that parents and other adults do not get concerned enough of the adolescents´ symptoms to initiate the contact if the symptoms are not disruptive; in contrast to depressive or anxiety disorders, disruptive or substance use disorders tend to associate with rapid treatment contacts (Anderson et al., 1987; Cohen et al., 1991; Kessler et al., 1996; Wu et al., 1999; Logan and King, 2002). Noteworthy is that subjects with early-onset forms of disorders continue to have low treatment contact rates even as adults (Kessler et al., 1996). Possibly, these subjects experience their long-standing disabling symptoms as normal as there has been no change in their mental health status (Kessler et al., 1996).

4.7.1 Psychiatric treatment seeking in major depression

Knowledge of the degree to which treatment is needed, provided, and used by young people with depression is important since in addition to its high incidence in youth,

depression tends to recur, with negative impacts on adulthood functioning. Reportedly, early onset depression is particularly severe and imparing (Giaconia et al., 1994; Kovacs, 1996).

Research has documented less than half of depressed adolescents and young adults to have contacted mental health services and less than one third of those depressed to have received psychiatric care (Offord et al., 1987; Whitaker et al., 1990; Keller et al., 1991; Goodyer and Cooper, 1993; McGee et al., 1993; Feehan et al., 1994; Lewinsohn et al., 1994; Cuffe et al., 1995; Newman et al., 1996; Lewinsohn et al., 1998; Oldehinkel et al., 1999; Flament et al., 2001; Wu et al., 2001). Treatment rates are even lower if impairment criteria are included in case definition (Whitaker et al., 1990). Of note is that of adolescents with major depression and suicidality or history of suicide attempt only 20- 25% have been estimated to receive psychiatric treatment (Rohde et al., 1991; Lewinsohn et al., 1994). In adolescent clinical samples, depression has been diagnosed in about 30-50% of those receiving treatment (Angold, 1988; Pelkonen et al., 1997).

There is evidence for an increasing prevalence of help seeking for depression in the most recent birth cohorts (Kessler et al., 2001). The inverse relationship between age at onset of the disorder and treatment contacts has, however, remained unchanged across all cohorts (Kessler et al., 1998b; WHO, 2000). Even in the youngest cohorts less than half of subjects with child- and adolescent-onset major depressions appear to have sought treatment by age 18 years (Kessler et al., 2001). Additionally, the delay in contacting treatment services is greater in adolescent-onset major depression compared to depressions with onset later in life, and subjects with adolescent-onset major depression continue to have low rates of treatment also later in life (Kessler et al., 1998b).

Factors increasing the likelihood of depressed youth to contact mental health services include female gender (McGee et al., 1990; Lewinsohn et al., 1994; Cuffe et al., 1995; Gasquet et al. 1997; Lewinsohn et al., 1998; Wu et al., 2001), being older (Gasquet et al., 1997), longer episode duration (Lewinsohn et al., 1994; Lewinsohn et al., 1998), coexisting psychosocial impairment (Lewinsohn et al., 1998; Wu et al., 1999), recurrence of major depressive episode (Lewinsohn et al., 1998; Wittchen et al.,

1998), history of childhood psychiatric problems (Newman et al., 1996), history of suicide attempt (Gasquet et al., 1997; Lewinsohn et al., 1998), having one or more co-occuring psychiatric disorders (Rohde et al., 1991; Bird et al., 1993; Fergusson et al., 1993; Lewinsohn et al., 1995; Lewinsohn et al., 1998; Wu et al., 1999), other health problems (Gasquet et al., 1997), poor academic performance (Lewinsohn et al., 1998), disruptive family structure and problems in family functioning (Gasquet et al., 1997; Verhulst and van der Ende, 1997; Lewinsohn et al., 1998) and parental perception of family burden due to adolescent´s depression (Logan and King, 2002).

Parents´ ability to recognize depression is considered important in the process of treatment seeking (Wu et al., 1999; Logan and King, 2002), and indeed enhancing parents´ readiness to identify signs of depression in their offspring has been suggested to facilitate service use among depressed adolescents (Wu et al., 1999; Logan and King, 2002). From parents´ point of view, however, this task is particularly challenging, since depressed adolescents tend to withdraw from parents, display fewer outwardly perceivable symptoms and course less family burden than adolescents with externalizing disorders (Angold et al 1998, Martin and Cohen, 2000). The impact of parental depression on adolescents´ help seeking is also complex: while parents with own experience of depression may be able to recognize similar symptoms in their offspring, certain aspects of parents´ mood problems such as withdrawal or helplessness may decrease their effectiveness in the help-seeking process (Logan and King, 2002).

4.8 Depressive disorders in youth: characteristics and distinctions

Compared with childhood, several changes in the prevalence and nature of depressive phenomena are seen during adolescent years, partly deriving from puberty, partly from the psychosocial maturation of the adolescent (Angold et al., 1998). Among these changes are the increase in the prevalence of depressive feelings, increase in the prevalence of depressive disorders, shift in the sex ratio to female preponderance after puberty, increase in the prevalence of mania, tendency of immediate grief reactions following bereavement to be more severe and of longer duration in adolescence than

in childhood, increase in the frequency of suicidal ideation and suicide attempts, and a steep increase in suicide mortality (Marttunen and Pelkonen, 1998).

Research has documented the core symptoms of depression in children and adolescents to be the same as in adults (APA, 1994). Therefore, studies on depression have generally applied adult diagnostic criteria also for children and adolescents, with two exceptions: first, instead of depressed mood, irritability may be regarded as a core symptom of depression in children and adolescents, and secondly, the required duration of dysthymia is shorter (one year) than among adults (two years). In contrast to depressions emerging in adulthood, called as late-onset depressions, those with onset in childhood or adolescence are often called early-onset depressions.

4.8.1 Major depression

As a vast majority of all youthful depressive disorders are major depressions, the focus in the following is on course and correlates of major depression. Briefly, course of adolescent major depression has shown to be relatively similar to that found in adults. Compared to adult depressions, the major distinctions concern the tendency of adolescent-onset major depression to recur, and the increased likelihood of adolescent major depression to switch to bipolar illness (Kovacs, 1996).

4.8.1.1 Risk factors

Among reported personal characteristics of the adolescent relating to major depression are poor coping skills, internalizing and externalizing symptoms (Lewinsohn et al., 1995), perceived unpopularity or lack of social skills (Lewinsohn et al., 1988), school problems (Lewinsohn et al., 1995), low self-esteem (Lewinsohn et al., 1988; Reinherz et al., 1993b), frequent somatic symptoms and disease (Lewinsohn et al., 1995), problematic substance use (Rohde et al., 1996), fear of dark and overall level of fears (Pine et al., 2001), previous psychopathology, especially past episodes of depressive or anxiety disorders (Lewinsohn et al., 1993; Lewinsohn et al., 1999),

and a history of suicide attempt (Lewinsohn et al., 1993). Finally, undesirable life events, especially loss events, as well as minor and major stress have been shown to relate to adolescent major depression (Reinherz et al., 1993b; Lewinsohn et al., 1995; Williamson et al., 1995a).

Of family-related factors there is growing evidence of an association between major depression in adolescents and parental psychopathology, especially parental major depression and substance use disorders (Todd et al., 1993; Williamson et al., 1995b; Kessler et al., 2001; Lieb et al., 2002). Recently, even subthreshold depressive symptoms in first-degree relatives were found to associate with an increased likelihood of major depression among adolescents (Lewinsohn et al., 2002). Poor family functioning, ranging from perceived lack of closeness to parents to extreme family conflicts and violence have also appeared as reported correlates of depressive disorders and symptomatology (Puig-Antich et al., 1993; Reinherz et al., 1993b). Several pre- and perinatal risk factors have been suggested, including maternal emotional problems during pregnancy, mediated by the effects of maternal depression, maternal-child conflicts, not being breastfed, and physical symptoms in the child (Allen et al., 1998). Findings regarding the effects of family social class on adolescent depression are inconsistent (Fleming and Offord, 1990). Studies have suggested that psychosocial stressors may play a more significant role in the precipitation of the first or second episode of major depressive disorder but have a less prominent role in the onset of subsequent episodes (APA, 1994).

Possible causal pathways are difficult to sort. School problems may result in major depression but, just as well, major depression may lead to school problems. Parental psychopathology is often part of a complex cluster of risk factors including family violence, neglect, abuse, and other types of childhood adversity (Kessler et al., 1997), and their effect on young people could be due to genetic influences, environmental influences, or combination of both (Kessler et al., 2001). Moreover, adverse life events such as early parental loss and sociodemographic variables that represent indirect indicators of environmental adversity (e.g., low social class, single-parent household) may be predictive not only of depression but of a wide range of mental disorders (Kendler et al., 1992; Kessler et al., 2001). It is likely that the cause is usually a combination of predisposing constitutional factors, genetic dispositions and

environmental provoking agents including earlier experiences and precipitating stressful events, and that these factors act through biochemical, psychological and social processes to produce the outcome (Harrington et al., 2001; Kessler et al., 2001).

In the Dunedin birth cohort, subjects diagnosed to suffer from major depression with early onset distinguished from those with late onset or no depression through their risk profile showing more early childhood neurodevelopmental problems in forms of perinatal and motor skill problems, more psychopathology and instability in their family of origin, and more behavioural and socioemotional problems (Jaffee et al., 2002). Likewise, studies have suggested heterogeneity in risk factors even within early-onset groups as a function of whether the child was prepubertal or postpubertal at onset (Harrington et al., 1997; Weissman et al., 1999b; Jaffee et al., 2002). This distinction is supported by findings on differing clinical course between childhood-onset and adolescent-onset major depression in adulthood (Harrington et al., 1990; Weissman et al., 1999b). Overall, the findings differentiating early- and late-onset major depression are consistent with results from family studies, suggesting that early-onset major depression may be a particularly serious form of depression, associating with distinct genetic and early childhood psychosocial risk factors (Kovacs, 1996; Kaufman et al., 2001; Jaffee et al., 2002). Future research is needed to determine whether these early childhood risk factors are genetically mediated and how these risks causally relate to the emergence of depression (Jaffee et al., 2002).

4.8.1.2 Phenomenology

The core symptomatology of depression is generally very similar between children, adolescents and adults (Roberts et al., 1995; Klein et al., 1999). The most common symptoms of major depression both in clinical and non-clinical adolescent samples are reportedly depressed mood, concentration or thinking problems, loss of interest and insomnia (Marttunen and Pelkonen, 1998). The major difference in symptom expression in major depression between clinical and non-clinical samples is the higher prevalence of suicidal ideation and suicidal attempts in clinical adolescent samples (Roberts et al., 1995).

Some age-related variability in the symptom picture of depression does exist (Kovacs et al., 1996). Among symptoms with the most consistent evidence of age-dependent expression is hypersomnia, which seems to be more common in adolescence than in either childhood or adulthood, but again becomes more prevalent among the elderly (Ryan et al, 1987; Mitchell et al., 1988). Appetite or weight loss has shown to increase in prevalence along the age span, being relatively rare among children but common among the elderly (Ryan et al, 1987). Finally, the presence of delusions related to major depression may be developmentally mediated: while children and adolescents express delusions about equally infrequently, delusions seem to increase in prevalence along adulthood (Ryan et al., 1987; Mitchell et al., 1988). Since research data on age-specific features in the expression of depression are relatively scarce and methodologies in studies differ, research findings on variations in symptom expression in major depression across age span need to be interpreted with caution (Kovacs, 1996).

4.8.1.3 Familiality

Depression tends to run in families. Studies in both clinical and non-clinical samples focusing on the relatives of children and adolescents with major depression have found increased rates of major depression in the relatives of depressed child and adolescent probands compared to normal control subjects, and this risk seems to be relatively specific for depression (Harrington et al., 1993; Todd et al., 1993; Williamson et al., 1995b; Kovacs et al., 1997a; Neuman et al., 1997; Klein et al., 1999; Klein et al., 2001). Still, while a significant proportion of depressed children become depressed as adults (Harrington et al., 1990; Lewinsohn et al., 2000b), majority of those who experience depression as adults have not been depressed as children (Klein et al., 1999). These findings have contributed to the increasing evidence of distinct origins for early- and late-onset forms of major depression (Kaufman et al., 2001). Yet, the high degree of familiality in depression does not imply that the linkages would be mediated entirely genetically. Environmental factors

such as discordant intrafamilial relationships are likely to predict the course of depressive disorders among youth (Harrington, 2001).

4.8.1.4 Age and major depression

Large-scale epidemiological studies have suggested a cohort effect in the prevalence of major depression: younger cohorts seem to display both an earlier age of onset and an increased prevalence of the disorder (Klerman and Weissman, 1992; Kessler et al., 1994).

Depression is relatively rare before the age 13, affecting only about 2% or less of the population in childhood, but becomes more prevalent with age (Birmaher et al., 1996; Angold et al., 1998). The Dunedin study, which has used a prospective longitudinal approach with structured diagnostic instruments administered several times over the time period from preadolescence to adulthood, have reported the total twelve-month prevalence of depression to increase from 1.8% at age 11 to 4.2% at age 15, 16.5% at age 18, and 16.8% at age 21 years (Anderson et al., 1987; McGee et al., 1990; Feehan et al., 1994; Newman et al., 1996). In that study, the peak increase in both overall rates of depression and new case incidence of depression occured between the ages of 15 and 18 (Hankin et al., 1998). That prevalence of depression culminates in late adolescence and early adulthood is now uniformly verified (Newman et al., 1996; Kessler and Walters, 1998). It is not yet clear why the prevalence of depression increases during adolescence, but is possibly due to diverse biological, psychosocial and cognitive factors (Birmaher et al., 1998). In clinical samples among youth the early emergence of depression is seen in that different from adult samples, children and adolescents diagnosed with major depression are almost entirely those with their first episodes (Kovacs, 1996).

4.8.1.5 Gender and major depression

Among the most widely documented issues but also one of the major unsolved problems in psychiatric epidemiology is the female preponderance in rates of major depression (Angold et al., 1998; Bebbington et al., 1998). While in childhood major depression occurs at approximately the same rates among both sexes, from adolescence on, females are about twice as likely as males to exhibit depression (Fleming and Offord, 1990; Kessler et al., 1994; Lewinsohn et al., 1994; Hankin et al., 1998; Lewinsohn et al., 1999; Cyranowski et al., 2000). Several studies have reported that between ages 11 and 13 years, the occurrence of major depression among females sharply increases, the prevalece estimates by about age 15 parallelling the 2:1 sex ratio seen in adults (Fleming and Offord, 1990; Angold and Costello, 1993; Lewinsohn et al., 1994; Birmaher et al., 1996; Oldehinkel et al., 1999; Cyranowski et al., 2000). Recently, Wade et al. (2002) reported this gender gap to have similarly emerged by age 14 in three different national samples. In the Dunedin study, the gender difference began to emerge between ages 13 and 15, but the most dramatic gender divergence occurred between ages 15 and 18 (Hankin et al., 1998). As reasons for the female preponderance the most recent theories have suggested a mixture of influences including neurohormonal differences, genetic factors, and diverse psychosocial factors, e.g. negative life events and chronic psychosocial difficulties (Angold et al., 1998; Cyranowski et al., 2000). Angold et al. (1998) have documented pubertal status to have greater influence on female depression rates than age or timing of puberty. The female preponderance appears to persist until about 55 years of age (Birmaher et al., 1996; Bebbington et al., 1998). The fall in the female-male sex ratio thereafter is suggested to result from the absolute fall in female prevalences, and is possibly linked to the menopause (Bebbington et al., 1998).

4.8.1.6 Remission and recovery

The mean duration of depression in non-clinical adolescent samples is approximately 4-6 months, while clinical samples show a longer duration of about 7-9 months (Birmaher et al., 1996; Kovacs, 1996). Of mid-late adolescents from general

population, 25% were recovered (as defined by presenting an asymptomatic period of more than two months) by three weeks, 50% by two months, and 75% by six months (Lewinsohn et al., 1994). Oldehinkel et al. (1999) discovered complete remission of major depression (defined as a period of at least two weeks and less than two months with no more than one clinically significant symptom) during their 20-month follow-up period in 43% of mid-late community adolescents. Among treated mid-late adolescents, majority of episodes remitted within nine months to one year (Sanford et al., 1995). Reportedly, approximately 90% of the major depressive episodes among treated children and early adolescents had remitted by 1.5- to 2 years after the onset (Kovacs et al., 1984; McCauley et al., 1993; Kovacs et al., 1997b). In adult samples up to 50% have reportedly recovered within six months, and approximately 80% by two years (Lewinsohn et al., 1994).

Major depressive episodes are suggested to run their own course and show relatively little variability as a function of many clinical and demographic characteristics (Kovacs et al., 1997 b). Some studies have suggested recovery from major depression to be faster when it occurs with than without underlying dysthymia (Warner et al., 1992; Kovacs et al., 1997b), while others have discovered no such association (McCauley et al., 1993; Lewinsohn et al., 1994; Sanford et al., 1995). Among contradictory but suggested predictors of longer duration of a major depressive episode are earlier age at onset of major depression, greater severity of depressive symptoms, presence of a comorbid psychiatric disorder, poor psychosocial functioning, presence of suicidality, exposure to negative life events, and parental psychopathology (Lewinsohn et al., 1994; Birmaher et al. 1998; Klein et al., 1999).

4.8.1.7 Recurrence of major depression

Majority of the recovered adolescents will go on to experience a second depressive episode relatively shortly after their first episode. Recurrence rates, as defined by the emergence of a new episode following recovery from the previous episode, of 40% in the following two years among treated children and early adolescents (Kovacs et al., 1997b), 40% in two years and 70% in five years among treated mid-adolescents

(Rao et al., 1995; Birmaher et al. 1998), 54% in three years among treated 7-17-year-olds (McCauley et al., 1993), as well as 12% in one year, and 33% in four years among mid-late adolescents from general population (Lewinsohn et al., 1994) are documented. These recurrence rates parallel those from clinical adult samples where approximately 50% of depressions have recurred at least once within two years after treatment (Lewinsohn et al., 1994; Birmaher et al., 1996). Importantly, risk of recurrence appears to increase over time and with each subsequent episode (Kovacs et al., 1997b; Lewinsohn et al., 2000b; Pincus and Pettit, 2001). Other predictors of episode recurrence include earlier age at onset of depression, severity of index episode, psychosis, psychosocial stressors, underlying dysthymia or another comorbid disorder, suicidal behaviours, lack of compliance with treatment, having conflict with parents, and family members presenting with recurrent major depressive disorder (Lewinsohn et al., 1994; Rao et al., 1995; Birmaher et al., 1998; Klein et al., 1999; Lewinsohn et al., 2000b). Some studies have suggested female adolescents to have higher risk of recurrence than their male peers (McCauley et al., 1993; Lewinsohn et al., 2000b), although such difference is not uniformly reported (Hankin et al., 1998). Overall, the recurrence rates of adolescent-onset major depression resemble those of adults but approximately 20 years earlier in the life span (Kovacs, 1996).

4.8.1.8 Shift to bipolar illness

Distinctively, 20% to 40% of clinically referred children and adolescents diagnosed with major depression develop a bipolar disorder within five years after their first depression episode (Kovacs, 1996; Birmaher et al., 1998). In contrast, approximately 10% of adults diagnosed with major depression are subsequently diagnosed a bipolar disorder (Coryell et al., 1995). The probability of switching to bipolarity seems much lower in adolescents from general population: Lewinsohn et al. (2000a) reported less than 1% of the prospectively followed non-clinical adolescents diagnosed with major depression to exhibit bipolarity by age 24. One explanation for the reported high rates of conversion may be that some of the major depressions in adolescents may in fact be first episodes of a bipolar disorder. Characteristics associated with increased likelihood of bipolarity (type I disorder with periods of major depression and mania)

include acute onset of severe depression, especially with psychomotor retardation or psychotic features, in a young person with no prepubertal psychopathology, and family history of a bipolar disorder or heavy loading for mood disorders (APA, 1994; Birmaher et al., 1996; Birmaher et al., 1998). In young adults, the conversion to bipolar type II disorder (periods of major depression and hypomania) has been associated with early-onset depression, atypical depression, seasonal affective disorder, protracted depressive episodes, mood lability, comorbid substance abuse, and high rates of psychosocial problems (Lewinsohn et al., 1995; Birmaher et al., 1996).

4.8.1.9 Continuity to adulthood

Major depression has showed strong continuity from childhood to adulthood: studies that have followed up youths with major depression into adulthood have showed that depressed adolescents are at increased risk of depression as adults (Garber et al., 1988; Harrington et al., 1990; Rao et al., 1995; Newman et al., 1996; Pine et al., 1998; Lewinsohn et al., 1999; Weissman et al., 1999a; Lewinsohn et al., 2000b). Harrington et al. (1990) reported up to 60% of depressed adolescents to have experienced an episode of depression in adulthood. Newman et al. (1996) documented 45% of non-clinical 21-year-olds with a mood disorder to have had an episode of depressive disorder when they were younger, and Lewinsohn et al. (1999) found 45% of those with a history of major depression to have developed a new episode between ages 19 and 24. Pine et al. (1998) discovered a four-fold increased risk of major depression by age 22 in depressed adolescents from general population. Finally, Weissman et al. (1999a) reported a two-fold increase risk of early adulthood major depression among treated depressed adolescents. It appears that this increased risk is relatively specific to depressive disorder (Garber et al., 1988; Harrington et al., 1990; Pine et al., 1998; Weissman et al., 1999a).

4.8.1.10 Association with psychosocial dysfunctioning

Major depression tends to associate with broad-based problems in psychosocial functioning and may thus compromise achieving the developmental tasks and influence future choices of the adolescent (Harrington et al., 1990; Puig-Antich et al., 1993; Rao et al., 1995; Weissman et al., 1999a).

Among the reported problems among adolescents with major depression are difficulties in their family relationships, conflicts and communication problems with parents, school problems and diverse problems with friends (Puig-Antich et al., 1993; Kaltiala-Heino et al., 1998; Rao et al., 1999). Likewise, more conflicts between the parents of the depressed adolescent are reported, especially on issues relating to child-rearing (Puig-Antich et al., 1993). Adolescents with major depression have demonstrated subsequent difficulties in interpersonal and intimate relationships (Garber et al., 1988; Harrington et al., 1990; Rao et al., 1995; Weissman et al, 1999a). Adverse adult outcomes include additionally poor social adjustment and functioning (Garber et al., 1988; Harrington et al., 1990; Rao et al., 1995; Rao et al., 1999; Weissman et al., 1999a; Fombonne et al., 2001b) and dissatisfaction with life (Rao et al., 1995).

Prospective studies have documented that even after recovery, children and adolescents may continue to show subclinical symptoms of major depression, negative attributions, impairment in interpersonal relationships, increased smoking, impairment in global functioning, early pregnancy, and increased phychosocial problems (Birmaher et al., 1996; Pelkonen et al., 1997; Weissman et al.,1999a). Both among adolescents and adults, episode number itself has shown to predict the outcome of major depression: the risk of psychosocial dysfunctioning after recovery from major depression seems especially to threaten youths with recurrent depressions. Instead, adolescents with nonrecurrent major depression may have good psychosocial outcomes similar to normal controls (Rao et al., 1995; Warner et al., 1995; Kovacs et al., 1997b).

4.8.1.11 Association with increased suicidality

Major depression is associated with increased risk of suicidality both in adolescence and adulthood (Harrington et al., 1990; Kovacs et al., 1993; Rao et al., 1993; Weissman et al, 1999a; Fombonne et al., 2001b). Reportedly, the risk of suicide for depressed children and adolescents followed to adulthood is about 5% (Rao et al., 1993; Harrington et al., 1994). Also, a high proportion of adolescents and young adults who commit suicide have suffered from major depression (Marttunen et al., 1991; Shaffer et al., 1996). Pelkonen et al. (1994) reported 85% of adolescents diagnosed with major depression in a Finnish outpatient sample to reveal suicidal thoughts and one in three of the depressed youth to have attempted suicide over lifetime.

Suicidality does not necessarily relate only to the most severe depressions: Kovacs et al. (1994b) reported majority of youths diagnosed with an adjustment disorder with depressed mood to reveal suicidal ideation, and Marttunen et al. (1991) discovered one in five adolescents who had committed suicide to have met the diagnostic criteria of an adjustment disorder. Besides depression, suggested predisposing factors for suicidality include previous suicide attempts, antisocial behaviour, anxiety, bipolarity, substance abuse, and personality disorders, family history of mood disorders or suicidal behaviour, exposure to family violence, impulsivity, and availability of methods (Marttunen et al., 1993; Birmaher et al., 1996). The risk of suicide and suicide attemps seems to be particularly increased when major depression coexists with substance use and antisocial behaviour (Marttunen and Pelkonen, 2000).

4.8.1.12 Adolescent major depression predicting adult mental disorders

Adolescent major depression is associated with significant long-term morbidity (Rao et al, 1995; Fombonne et al, 2001a). There is continued risk of recurrence and persistence of depressive episodes into adulthood (Garber et al., 1988; Harrington et al, 1990; Fleming et al, 1993; Rao et al., 1995; Kovacs et al., 1997b; Pine et al., 1998; Lewinsohn et al., 1999; Rao et al 1999; Weissman et al., 1999a; Fombonne et al,

2001a). As noted, distinctive to adolescent-onset major depression is the increased likelihood of its conversion to bipolarity (Kovacs, 1996; Birmaher et al., 1998). Importantly, the increased risk of adult major depression seems to apply postpubertal rather than prepubertal depressions (Harrington et al., 1990; Weissman et al., 1999b). Of nonaffective disorders, adolescent major depression has shown to associate with subsequent anxiety disorders (Rao et al., 1995; Pine et al., 1998), substance use disorders and other substance misuse (Birmaher et al., 1996; Lewinsohn et al., 2000b). Finally, increased occurrence of psychiatric and medical hospitalizations and treatment use are among important reported outcomes of adolescent major depression (Garber et al., 1988; Harrington et al., 1990; Weissman et al., 1999a).

4.8.2 Other depressive conditions in youth

4.8.2.1 Dysthymia

Dysthymic disorder typically has onset in adolescence or early adult life, and shows a chronic course, with a mean episode length of about four years, and in addition to the elevated risk of subsequent major depression, is associated with increased risk of a bipolar disorder (13%), and substance abuse (15%) (Birmaher et al., 1996; Kovacs et al., 1994a). Dysthymic youth tend to have their first episode of major depression two to three years after the onset of dysthymia, suggesting that dysthymia is one of the gateways to the development of recurrent mood disorders (Kovacs et al., 1994a). The treated course of dysthymic disorder appears similar to that of other depressive disorders (APA, 1994). Dysthymic disorder is more common among first-degree relatives of individuals with major depression than in the general population; both dysthymia and major depression are more common in first-degree relatives of individuals with dysthymia (APA, 1994).

In particular, youths with double depression display a more severe course of their episodes, higher rates of other comorbid disorders, more suicidality, and greater social

impairment than those with major depression or dysthymia alone (Birmaher, 1996; Oldehinkel et al., 1999).

4.8.2.2 Adjustment disorders with depressed mood

The relation between adjustment disorders with depressed mood and other mood disorders is somewhat unclear (Lewinsohn et al., 1999). Lewinsohn and colleagues (1999) have reported the prognosis of adjustment disorder with depressed mood among late adolescents not to differ from that of adolescent major depression in predicting future major depression and non-affective disorders. Earlier, Greenberg et al. (1995) reported adolescents and adults diagnosed with adjustment disorder to present more suicidality, and adults also more substance use disorders than subjects with other admission diagnoses. Although often comorbid with other mental disorders, adjustment disorders are usually self-limited and associated with less severe mood disturbance, fewer symptoms, and no relapse (Kovacs et al., 1994b). If the individual begins to fulfill criteria for major depression, or if the symptoms of adjustment disorder last longer than 6 months, other diagnoses, such as dysthymia, are used (APA, 1994).

4.8.2.3 Predictive significance of adolescent depressive symptoms

Prevalence of moderate to severe depressive symptoms not meeting DSM-criteria has been estimated to be at least 10% (Olsson and von Knorring, 1997; Rushton et al., 2002) among adolescents from general population. These symptoms have shown to be relatively stable through adolescence (Charman et al., 1994; Devine et al., 1994; Orvaschel et al., 1995; Pine et al., 1999). They are reportedly more common among females than males, and among older than younger adolescents (Olsson and von Knorring, 1997; Rushton et al., 2002). The course and outcome of depressive symptoms have been documented to resemble that of major depression (Gotlib et al., 1995; Oldehinkel et al., 1999; Pine et al., 1999). Yet, the clinical significance of subclinical depressive symptoms is less well known than that of clinical depression.

Adolescents with subclinical depressive symptoms are in their early adulthood suggested to present with increased rates of depression (Kandel and Davies, 1986; Gotlib et al., 1995; Pine et al. 1999), substance use disorders (Gotlib et al., 1995; Lewinsohn et al., 2000b), heavy smoking and smoking initiation (Kandel and Davies, 1986; Escobedo et al., 1998) and a variety of adverse psychological and social outcomes, eg. suicidality (Kandel and Davies, 1986; Gotlib et al., 1995), physical health problems (Kandel and Davies, 1986), academic and school problems (Kandel and Davies, 1986; Kaltiala-Heino et al., 1998), increased use of medically prescribed tranquilizers (Kandel and Davies, 1986), psychiatric hospitalizations (Kandel and Davies, 1986), more deviant behaviour and accidents (Kandel and Davies, 1986), low self-esteem (Devine et al., 1994), impairment in social functioning (Devine et al., 1994; Gotlib et al., 1995; Oldehinkel et al., 1999; Pine et al., 1999), problems in close interpersonal relationships within the family and in establishing intimate relationships with spouse or partner (Kandel and Davies, 1986), and early parenting (Kandel and Davies, 1986).

4.9 Summary of the reviewed literature: knowns and unknowns

Epidemiological studies show adolescent mental disorders including major depression to be relatively common, with current prevalence estimates of approximately 10-25% for any mental disorder and 4-8% for major depression. The interpretation of prevalence data is hampered by several methodological discrepancies between studies. Prevalence of major depression and other mental disorders seem to peak in late adolescence and early adulthood, with female preponderance. While from public health point of view truthful data on associated treatment needs, actual treatment use, and factors associating with treatment seeking would be more relevant than plain prevalence data, there is relatively little research on these issues. Still, the existing research data have suggested only one third of adolescents suffering from mental disorders to have received treatment for their condition. Corresponding data on young adults from general population is particularly scarce, and concerning Finnish young adults this information has thus far been lacking.

Majority of adolescents who suffer from a mental disorder also have one or more others. Comorbidity is documented to relate with several functional and clinical problems, including its impact on treatment effectiveness. Nevertheless, several issues relating to comorbidity, e.g. the significance of the temporal order of comorbid disorders and risk factors for comorbidity, are insufficiently charted. This applies both mental disorders in general and major depression in particular.

Major depression is a highly recurrent mental disorder with often a chronic course. It is a complex disorder that does not result from either genetic or environmental factors alone, but rather from an interaction of several risk factors. It has shown high degree of familiality, partly mediated through genetic mechanisms with strong influences of environmental factors. Distinct genetic and psychosocial risks for childhood- and adolescent onset major depressions are suggested, yet the underlying mechanisms are obscure.

Adolescents suffering from major depression frequently show broad-based psychosocial dysfunctioning, psychiatric comorbidity and suicidality. They also continue to have increased risk of depression and other mental disorders, attempted and completed suicide, as well as poor psychosocial outcome later in life. Considering the adverse consequences and the tendency to recur of major depression, there is urgent need for developing diagnostic instruments to help its early identification among young people. Thus far, comparison studies between existing structured and semistructured diagnostic instruments in non-clinical samples are in general few in number, and concerning young adults no such data exist.

Finally, subclinical depressive symptoms are reportedly common in adolescence. The relationship between adolescent depressive symptoms and adult psychosocial functioning and psychiatric health has received increased research interest, but controversy still exists regarding their predictive significance.

5 AIMS OF THE STUDY

This study investigated the prevalence and correlates of major depression and other mental disorders among a group of young adults with high-school background, evaluated the applicability of a highly structured instrument in assessing depression, and examined the predictive impact of adolescent depressive symptoms. The specific aims of the study were:

I To provide descriptive and clinically relevant epidemiologic data on current mental disorders, related treatment need and treatment use among young adults, focusing on depression (Study I).

II To provide data on the epidemiology of 12-month depression and treatment seeking behaviour of depressed young adults (Study II).

III To study the accuracy of a highly standardized interview instrument in detecting major depressive episode (Study III).

IV To examine the predictive significance of adolescents´ depressive symptoms in their early adulthood mental well-being (Study IV).

6 METHODS

6.1 General study design

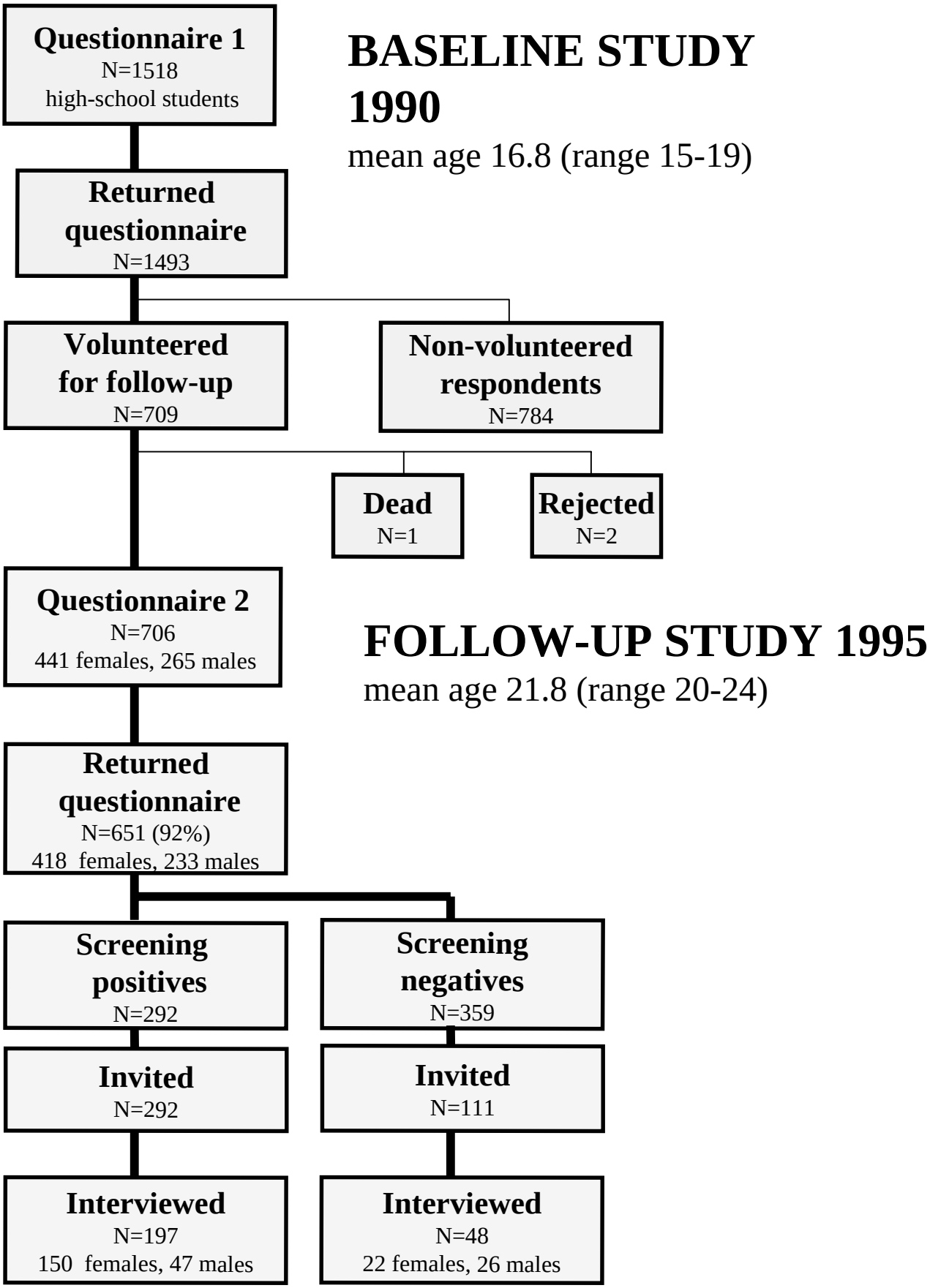
The study procedure is illustrated in Figure 1.

6.2 Baseline study in 1990: sample and procedure

The present study is part of a five-year follow-up of high-school students first examined by questionnaire in 1990 (Poikolainen et al., 2000a). During a regular classroom hour, adolescents were asked to fill in a self administered questionnaire, supervised by research assistants. Confidentiality and voluntariness were emphasized. The students were free to refuse to answer, to respond anonymously, or to give their written consent to take part in the follow-up examination. The baseline study comprised 1518 adolescents attending five urban high-schools in Helsinki (approx. 500 000 inhabitants) and five in Jyväskylä (60 000), located in southern and central Finland, representing a crossection of urban environments and school entrance requirement levels. In Jyväskylä, all schools except the newest one were included; in Helsinki, five schools were sampled from a total of 33, stratifying for different levels of school entrance requirements.

Of the 1518, 1493 responded (45% males, 55% females), of whom 47% (N=709) (41% of males [N=267], 54% of females [N=442]) gave their written, informed consent to enter the follow-up study. The subjects were mean aged 16.8 years (SD 0.9, range 15-19). No significant differences between the follow-up volunteers and and the anonymous group were found in terms of family social class, school grade-point average, age, number of recent life events, or scales measuring their self-esteem, state anxiety, or psychological defense styles, whereas somatic symptoms were slightly less reported by non-volunteering respondents (Poikolainen et al., 2000a).

Figure 1


Questionnaire 1
N=1518
high-school students
BASELINE STUDY 1990
mean age 16.8 (range 15-19)
Returned questionnaire
N=1493
Volunteered for follow-up
N=709
Non-volunteered respondents
N=784
Dead
N=1
Rejected
N=2
Questionnaire 2
N=706
441 females, 265 males
FOLLOW-UP STUDY 1995
mean age 21.8 (range 20-24)
Returned questionnaire
N=651 (92%)
418 females, 233 males
Screening positives
N=292
Screening negatives
N=359
Invited
N=292
Invited
N=111
Interviewed
N=197
150 females, 47 males
Interviewed
N=48
22 females, 26 males

6.3 Follow-up study in 1995

The follow-up in 1995 had a two-phase design. First, all but three of the 709 volunteers were mailed a new questionnaire; of the volunteers two were excluded due to incomplete baseline questionnaires, and one male had died, resulting a total size of the follow-up group of 706 subjects, 264 males and 442 (63%) females. In 1995, a follow-up questionnaire with up to four reminders was sent, the response rate being 92% (N=651): 88% among males (N=233) and 95% among females (N=418).

The questionnaire repeated scales measuring various aspects of mental health plus included items charting the subjects´ life situation, educational and occupational career and related future prospects, physical health, and substance use behaviour of both subjects and their family members. Additionally, the General Health Questionnaire (GHQ; Goldberg, 1972), a widely used self-administered rating scale for assessing psychiatric symptomatology, was included. Based on their responses in five screens included in the 1995 questionnaire, subjects were divided into screening positive and negative subgroups. All screening positive and a random sample of screening negative respondents were approached for clinical interviews.

6.3.1 The study sample (N=651) in 1995

At time of the follow-up study in 1995, of the 651 respondents 47% lived in the Helsinki area and 45% in the Jyväskylä area; at time of the baseline study the corresponding proportions had been 43% and 57%. About 95% had completed high-school; four were currently studying for the high-school degree. Of females 72% and of males 54% ($p<0.001$) were full-time students. Of these, 38% were studying at universities or other institutes for higher education. About 4% had not applied for any kind of education. Full-time job was reported by 11% . Currently abroad were 6% of the subjects. Of males, 81% had completed their military service; 15% were currently on duty.

A higher proportion of males (43%) than females (23%) were living with their parents ($p<0.001$ for difference). Alone lived 29%, and 27% of females and 17% of males were currently cohabiting. Married were 13 females (3% of females) and 3 males (1%). One female respondent had divorced. Four respondents (1%), all females, had children, and five were pregnant. Parents of 21% (136) of the respondents were divorced; 11% (70) had a stepmother-or father. Parent had died of 27 subjects (4%)(Poikolainen et al., 1997).

6.3.2 Screening for follow-up interviews

The main screen for the follow-up interviews was the General Health Questionnaire (Goldberg, 1972). It has been validated both among adults and adolescents of the general population (Winefield et al., 1989; Goldberg et al., 1997; Holi et al, in press). The sensitivity of the questionnaire has been found to vary from 76% to 89%, and specificity from 80% to 87%, depending on the length of the version applied (Bridges and Goldberg, 1989). The GHQ covers feelings of strain, depression, inability to cope, anxiety-based insomnia, lack of confidence and other psychological problems (Wall et al., 1998). We used the GHQ-36, which is reportedly accurate in detecting anxiety, and depression with anxiety (Katz et al., 1995).

For each item the respondents were asked whether they had experienced a particular symptom during the previous month. The response scale was : 1) less than usual, 2) no more than usual, 3) more than usual and 4) much more than usual. We applied the standard GHQ scoring method (0-0-1-1), counting only the last two responses as pathological (Goldberg et al., 1972). Following the conventional threshold 4/5 to indicate subjects at risk of psychiatric disorder, when a subject scored five or more in the GHQ he/she was classified as screening positive (Huppert and Whittington, 1995). Cronbach´s internal consistency coefficient alpha of the GHQ was 0.93 for females and 0.92 for males.

The four additional screening instruments were 1) life-time self-reported referral to mental health services, 2) pathological eating behaviour, 3) heavy early intake of

alcohol, and 4) recurrent depressive feelings. Life-time self-reported referral to mental health services was charted by asking whether the respondents had ever contacted or intended to refer themselves to mental health services. All those who answered yes were regarded as screening positive (29 males and 104 females). Pathological eating behaviour was evaluated by the statement ”I purge myself after eating in order to maintain my weight”, with a response scale of 1) no, 2) sometimes, 3) often, 4) almost always. Options 2-4 were considered as screening positive (27 females). A measure of alcohol use was created by calculating each respondent´s estimated yearly intake of pure alcohol, based on the self-reported frequency of drinking alcohol and average alcohol consumption on each occasion. Based on results of a large cross-sectional study among Finnish first-year university students (Nyström et al., 1993), the threshold yearly intake of pure alcohol regarded as heavy, indicating positiveness in the screen, was 15 kg for males and 10 kg for females (14 males, 18 females). Recurrent depressive feelings were evaluated by two statements ”I am often depressed” and ”I am continuously depressed”, with scoring options 1) no, 2) somewhat, 3) moderately so, or 4) very much so. Total scores of five or more (out of eight) were regarded as screening positive (10 males, 38 females).

A positive rating in one or more of the five screens led to an invitation to clinical interview. Of the total of 651 respondents who returned the questionnaire, 31% (N=203; 151 females and 52 males) were positive by GHQ scoring. The other four screens identified additional 89 subjects not positive by their GHQ score, giving altogether 292 screening positive subjects.

6.4 Clinical interviews

In the second phase, all screening positive respondents (N=292) and a sample (N=111) of screening negative respondents were invited by letter to participate in clinical interviews. The letter described the follow-up study and included a pre-paid envelope for returning the consent form. The interviewers contacted and informed those who agreed to participate, and scheduled an appointment. In all, 197 (68%) screening positive respondents (47 males, 150 females) and 48 screening negative

respondents participated in the interviews, giving a total of 245 interviews (73 males, 172 females).

Of the 111 screening negative respondents, 48 were interviewed (26 males and 22 females). No differences were found between the screening negative respondents interviewed (N=48) and those invited but not interviewed (N=63) as regards their sex (22 of the invited 52 females and 26 of the 59 males were interviewed; 42% vs. 44%, p=1.0), or age (mean age 22.0 [SD 1.1] among the interviewed vs 21.0 [SD 4.1] among females; p=0.3, two-tailed t-test; mean age 21.8[SD 0.9] vs. 21.9[SD 0.9] among males; p=0.3, two-tailed t-test), or the mean GHQ score (0.7 [SD 1.1] among the interviewed and 0.9 [SD 1.3] among the non-interviewed; mean difference 0.2, p= 0.4, 95% CI [-0.2, 0.7], two-tailed t-test).

The total mean GHQ score among the interviewed screening positive subjects was 9.1 (SD 7.3), compared to 8.0 (SD 6.6) in the non-interviewed screening positives (mean difference -1.1, p=0.2, 95% CI [-2.9, 0.6]). Among screening negative subjects, the corresponding figures were 0.7 (SD 1.1) for the interviewed and 0.9 (SD 1.3) for the non-interviewed (mean difference 0.2, p= 0.4, 95% CI [-0.2, 0.7]). The interviewed screening positive females reported at p<0.01 level higher and, respectively, males at p<0.05 level lower yearly intake of alcohol than their non-interviewed screening positive counterparts (yearly intake 4285g vs. 2932g in females, 2443 g vs. 6369 g in males, correspondingly). Further, interviewed screening positive females reported more often having used mental health services than the non-interviewed screening positive females (33% vs.12%, p<0.01). No other differences were found between those interviewed and those invited but not interviewed in either screening positive or negative subgroups as regards other screening characteristics, nor in their family social class, age or sex.

Majority of interviews took place in Helsinki. With four exceptions, interviews were recorded to allow reanalyses of the interview data. The interview session started by reviewing the main events of the subjects´ life history, focusing on the five-year follow-up period. Subjects´ educational goals and achievements were discussed, quality of relationships with family members and peers were asked, as also experiences of unemployment, earlier contacts to health services, and family history

of somatic and mental illness and substance use. Thereafter, semistructued diagnostic SCAN 2.0 interview (Schedules for Clinical Assessment in Neuropsychiatry) (WHO, 1994) was administered, followed by the CIDI-SF (The World Health Organization Composite International Diagnostic Interview Short-Form) (Kessler et al., 1998a), a structured instrument developed to identify major depressive episodes. Before introducing the CIDI-SF, the subjects were informed that the two different interview instruments would be investigated, and they were encouraged to answer the questions independently of their answers in the preceding interview. They were also informed that although the first instrument (SCAN) was extensive and time-consuming, the second one (CIDI-SF) would take only a few minutes to complete. Interview information was recorded on special schedules, and a summary was written of each interview. The mean duration of the interview was 90 minutes (SD 34 min, range 40 – 210 min).

6.5 Diagnostic procedure

6.5.1 The SCAN

Diagnoses of mental disorders were based on information from semistructured clinical SCAN interview (SCAN 2.0; the Schedules for Clinical Assessment in Neuropsychiatry) (WHO, 1994). The SCAN 2.0 is a semistructured instrument which aims to assess, measure and classify psychopathology and behaviour associated with the major psychiatric syndromes of adult life, covering both ICD-10 and DSM-IV Axis I diagnostic categories. The SCAN is developed from the Present State Examination (Wing et al 1974), the 10th edition of which is incorporated in the SCAN 2.0. It is primarily designed for use by psychiatrists and clinical psychologists. The aim of the interviewer is to discover which phenomena and which disorders have been present during a designated period of time and with what degree of severity. The onset and course of each disorder or symptom are discussed with the interviewee. The feasibility and reliability of SCAN have been tested in international field trials (WHO, 1994). The three interviewers were trained at WHO-designated SCAN training centres.

The key principle of the SCAN is that the interview, although substantially structured, retains the features of a clinical examination. During the SCAN interview the interviewer decides, based on the preliminary questioning in the beginning of the interview and the way the interview is proceeding, the order and degree to which specific items in different sections and symptom lists are gone through. Each section of the interview includes preliminary questions that are presented to each subject. After these questions there is a cut off where the interviewer may end discussing the items of the respective section and move to the next one on that particular section. In this way the interview proceeds disorder by disorder, in the order chosen by the interviewer, and the onset and course of each disorder or symptom are discussed at the end of each section. The aim of the interviewer is thus to discover which phenomena and which disorders have been present during a designated period of time and with what degree of severity. The time needed for the interview varies depending on the information the subject is producing.

6.5.1.1 Assessment of mental disorders using SCAN consensus procedure

Throughout the study, problematic issues were discussed by the two principle interviewers. To increase reliability these two interviewers rated the 33 interviews of the third interviewer by consensus. The best-estimate research diagnoses were generated from the diagnostic interview information. The diagnostic team, two principal interviewers and a senior consultant, made the diagnoses in two phases. First, based on the SCAN interview, the two principal interviewers made preliminary DSM-IV Axis I research diagnoses by consensus, using DSM-IV hierarchy rules. Thereafter, all cases with a preliminary diagnosis and all unclear cases were reconsidered with the senior consultant. When necessary, the tapes were re-examined. In unclear cases additional data (clinical observations, other information from the interview, and questionnaire) were also used. By applying the use of the SCAN interview by the best-estimate method, in accordance with the Longitudinal Expert All Data (LEAD) Standard (Spitzer, 1983), we aimed to maximize the validity of the research diagnoses. Diagnoses of DSM-IV personality disorders were made by

consensus following the LEAD Standard; all available interview data and clinical observations were used, although strictly based on DSM-IV diagnostic criteria.

DSM-IV disorders on Axis II were best-estimate diagnoses based on SCAN-interview data, interview information gathered before introducing the SCAN, and questionnaire data, diagnoses relying on DSM-IV hierarchy rules.

Studies I and IV deal with various aspects of current mental disorders, occurring during the four weeks before the interview. Studies II and III report data on 12-month depression, as defined later.

Multiple diagnoses were allowed. Current nonaffective comorbidity (occurring during the four weeks before interview) is reported in Studies I and IV, 12-month comorbidity in Studies II and III. In Studies I and II comorbidity refers to any Axis I or II comorbidity; Studies III and IV report comorbidity on Axis I.

Data on the temporal order of the disorders were also reviewed at the consensus meetings. Here, too, we aimed to maximize the reliability by careful consideration of all available data. Three cases out of 25 were excluded because the available data were considered inadequate to determine the temporal relationship of disorders.

6.5.2 Other measures on diagnostic data basing on SCAN consensus procedure

6.5.2.1 Global assessment of functioning

The GAF scale (Global Assessment of Functioning scale) designed for Axis V in the DSM-IV (APA, 1994) was completed for each subject. By definition, the GAF scale is to be rated with respect only to psychological, social, and occupational functioning, not including impairment in functioning due to physical or environmental limitations. In the present study, the rating was made consensus-based in the diagnostic team by

picking a single value on a scale 1-100 that best reflected the individual´s overall level of functioning. As instructed (APA, 1994), the GAF score was considered within a particular 10-point range if either the symptom severity or the level of functioning (whichever was worse) falled within that range.

In this study, data on the level of subjects´ psychosocial functioning were used both categorically (Studies I-IV) and dimensionally (Studies I and II). “At least mild impairment” was defined as scoring 70 or less, and “at least moderate impairment” 60 or less on the GAF scale. The latter definition was used in the analyses to indicate clinically significant impairment; by definition, the rating 60 or less implies “at least moderate symptoms or moderate difficulty in social, occupational, or school functioning”. The preference of categorical use of the data was based on the study aims of producing clinically relevant prevalence data. Studies I and IV report current GAF scores referring to the four weeks before interview, while ratings of overall psychosocial functioning during the worst phase of the 12-month episode are reported in Studies II and III.

6.5.2.2 Psychiatric treatment need

The need for psychiatric care of each subject was scored as follows: 1) indicated ”no psychopathology, no need for treatment” , 2) ”possibly mild psychopathology but no obvious need for psychiatric treatment” , 3) ”psychopathology, would benefit from treatment” , 4) ”psychopathology with severe need for psychiatric treatment; serious worsening of mental health likely without prompt treatment”, following in outline the definitions by Kashani et al. (1987a). In the present study, classification ”need for treatment” refers to scores 3 or 4 irrespective of the severity of need of psychiatric care, while ”severe need for treatment” (score 4) only indicates those with the most severe need for treatment. The evaluations of level of need of psychiatric care were made by consensus between two members of the diagnostic team, both with clinical experience, and were based on all available interview data plus clinical judgement.

The evaluation of the level of treatment need implied current need for psychiatric treatment for any mental disorder in Study I, reported separately for treatment need in general (score 3 and 4) and for severe need (score 4). Studies II and III report treatment needs (score 3 or 4) associated with 12-month depression.

6.5.3 The CIDI-SF

The World Health Organization Composite International Diagnostic Interview Short-Form (CIDI-SF) (Kessler et al., 1998a) was used to generate a probability diagnosis of DSM-III-R (APA, 1987) major depressive episode (MDE) during the preceding 12-month period. The CIDI-SF is a modification of the Composite International Diagnostic Interview (CIDI) (WHO,1990), a structured diagnostic interview designed for use in general population samples by trained interviewers who are not clinicians. Both CIDI (Wittchen et al., 1994) and CIDI-SF (Blazer et al., 1994; Kessler et al., 1998a) have showed good reliability and validity in most diagnostic categories, including affective disorders. To create the CIDI-SF, a set of respondents endorsing the CIDI stem questions in the National Comorbidity Study was studied and the optimum algorithm to reproduce CIDI diagnoses was created. Compared to the full CIDI, the CIDI-SF has performed well for MDE, as indicated by a sensitivity of 89.6% and specificity of 93.9% (Kessler et al., 1998a).

6.5.3.1 Assessment of MDE using the CIDI-SF

According to the diagnostic algorithm of CIDI-SF, the diagnosis of MDE is determined by the presence of depressed mood or anhedonia for at least two weeks, lasting at least half of the day, plus at least two additional symptoms of depression. The two stem questions of the CIDI-SF MDE-section introduced to all subjects are 1) “During the past year, have you felt sad or depressed?” 2) “During the past year, have you lost interest in most things like work or hobbies or things you usually like to do for fun?” Respondents endorsing the stem questions are asked further questions specifying the intensity and duration of the stem items and of other diagnostic

symptoms (Kessler et al., 1998). Assessment of psychomotor disturbance is not included and the total number of depressive symptoms included in the Short Form is eight (Kessler et al., 1998a). The cut-point chosen depends on the aim of the study (Kessler et al., 1998a). As in another general population study using the CIDI-SF, the cut-point of three symptoms out of eight in total was used (Haarasilta et al., 2001). This procedure identified 65 subjects (13 males and 52 females).

6.6 Collection of other mental health data by questionnaire

6.6.1 Questionnaire data from the baseline study in 1990

6.6.1.1 Depressive symptoms

Depressive symptoms in adolescence (used in Study IV) were assessed by two items in the 1990 questionnaire: ”I often get depressed”, and ”I am continuously depressed”, with a response scale 1) no, 2) somewhat, 3) moderately so, 4) very much so. In order to exclude subjects with transient depressive feelings, this measure was dichotomized so that presence of depressive symptoms was recorded only for scores 3 or 4 in either question or both.

6.6.2 Questionnaire data from the follow-up study in 1995

6.6.2.1 General Health Questionnaire (GHQ)

Measurement of psychiatric disturbance (used in Study IV) refers to a total score of five or more in the GHQ-36 questionnaire (Goldberg et al., 1972) as described earlier (see 6.3.2).

6.6.2.2 CAGE

Problem drinking (used in Study IV) was defined as two or more positive answers to the four items of the CAGE questionnaire designed to detect alcohol problems: “Have you ever felt the need to Cut down on your drinking?”, “Have you felt Annoyed by criticism of your drinking?”, “Do you ever feel Guilty about your drinking?”, “Have you ever had a drink in the morning to get rid of a hangover?” (an Eye-opener) (Ewing, 1984). When compared to DSM-III and DSM-III-R-defined substance use disorders, the sensitivity and specificity of the CAGE have ranged between 48%-100% and 68-99%, respectively. Among adolescents, the CAGE has showed low sensitivity (6-39%) but high specificity (94-99%) (Chung et al., 2000).

6.6.2.3 Psychiatric treatment use and intention to seek treatment

Data on use of mental health services were collected by questionnaire, and requestioned and updated at interview. ”Contact during episode” referred to any contact to specialty or general medical outpatient services for mental health problems during the defined episode. Informal helping agencies were not included. ”Ongoing contact” meant any currently ongoing contact to psychiatric services at the time of interview. Use of psychotropic medication prescribed by a physician other than a psychiatrist (N=2) was also considered as psychiatric treatment. None of the subjects reported use of psychiatric inpatient services during any designated period of Studies I-IV. “Intention to seek treatment” was evaluated by asking whether the subject had ever intended to use mental health services for his/her problems, with response options for no prior contacts being ”no” and ”no, but I have considered it”. The former group was considered as subjects with negative treatment intention, and the latter as subjects with no contacts but intention to use services.

Study I reports rates of treatment contacts for any mental disorder separately for ongoing contacts (at time of interview), and for those that had occurred at any stage of the current episode. It is noteworthy that contact(s) during current episode of dysthymia, for example, may have occurred even years ago. Study II reports rates

separately for any contacts due to depression over lifetime, those occurring at any phase of the 12-month episode, as well as subjects´ intention to seek help.

6.7 Data analyses

6.7.1 Selection of subjects in Studies I-IV

In Studies I and II, data analyses on prevalence estimates were confined to the 647 subjects (414 females and 233 males) of the 651 subjects who returned the 1995 questionnaire, since in four cases (all females) data were incomplete. Testing for associations between diagnostic impairment and need of psychiatric care, as well as other comparisons of the clinical characteristics, were restricted either to the interview sample of 245 subjects (Study I), or to the 67 subjects diagnosed with any type of 12-month depression (Study II). Study III based on the analyses of the 239 subjects with complete data from both the SCAN and the CIDI-SF interviews. In Study IV, the study subjects comprised the 651 respondents examined by questionnaires both in adolescence and early adulthood. For analyses of diagnostic data, a subgroup of 245 interviewed young adults was used.

6.7.2 Definition of depression in Studies I-IV

Based on DSM-IV (APA, 1994) classifications of psychiatric disorders, “depressive disorders” in the present studies (I,II,IV) comprise MDD (major depressive disorder), dysthymia and depressive disorder not otherwise specified. The term “depressive syndrome” comprises additionally adjustment disorders with depressed mood (Studies I and II). The reported rates base on either current (I,IV) or 12-month (II, III) time-frames. Studies I and II additionally provide separate rates for major depressive disorder and dysthymia.

In Study III, as the CIDI-SF diagnosis of 12-month major depressive episode also comprises depressive episodes of a bipolar disorder, these disorders (three subjects

based on the SCAN consensus procedure) were included in the definition of depression. The concept ”mood syndrome”, used in further analyses of Study III, additionally comprised dysthymia, depressive disorder NOS and adjustment disorders with depressed mood occurring during the preceding 12 months.

6.7.3 Statistical methods in Studies I-IV

In Studies I and II, prevalence estimates for disorders were calculated by the double sampling method (Levy and Lemeshow, 1991), giving different weights for disorders diagnosed in screening positive (N=197) and screening negative (N=48) interview subsamples. Therefore, prevalence estimates for disorders vary depending on the ratio of screening positive to negative subjects among those with a diagnosis. The prevalence estimates were calculated with weights that take into account the differences in the sampling ratios (screening negative versus screening positive) using the following formula:

$$x = \frac{\frac{k_1}{m_1} \times m + \frac{k_2}{m_2} \times (n - m)}{n}$$

where

x= estimate of prevalence

n= the number screened from the population of N elements

m= the number positive for the screening test

n-m= the number negative for the screening test

m_1= the number sampled from the group of m individuals initially positive for the screening test

k_1= the number confirmed as positive from the m_1 subjects initially positive and resampled

m_2= the number sampled from the group of *n-m* individuals initially negative for the screening test

k_2= the number of subjects confirmed as positive from the m_2 subjects initially negative and resampled

In these studies, testing for associations between diagnosis, impairment and need of psychiatric care, as well as other comparisons of the clinical characteristics, were restricted to the interview sample, using nonweighted data. The Chi-square test and Fisher´s exact test were used for categorical variables and the independent samples t-test for continuous variables.

In Study III, correspondence between SCAN consensus and CIDI-SF MDE diagnoses was evaluated by overall percent agreement, sensitivity and specificity as well as kappa statistics, which controls for chance agreement. In the analyses of discrepantly identified subjects, chi-square procedures, Fisher´s exact test and independent samples t-test were applied.

The sensitivity, specificity, overall percent agreement (% agreement), and nonweighted kappa values were calculated as follows:

		SCAN consensus diagnosis	
		+	-
CIDI-SF diagnosis	+	a	b
	-	c	d

kappa nonweighted= 2(ad-bc)/[2(ad-bc)+N(b+c)]

sensitivity= a/(a+c)

specificity= d/(b+d)

% agreement= (a+d)/N*100

In addition to nonweighted kappa values (relevant for treatment seeking populations) we calculated weighted kappas, taking into account the two-stage study design (relevant for community studies) using the following formula:

kappa weighted=a* kp + (1-a)*kn

where
a= (interviewed screening positive subjects /all interviewed subjects)
kp= kappa among interviewed screening positive subjects
kn= kappa among interviewed screening negative subjects

In study IV, depressive symptoms reported in adolescence were analysed against outcome data from questionnaire and interviews. Logistic regression analyses were used to estimate odds ratios for measuring the strength of associations between adolescent depressive symptoms and each early adulthood outcome. Age of respondent, family social class at baseline, and sex were used as covariates in each logistic model.

In all analyses, a probability level ≤ 0.05 indicated statistical significance.
The computations were made using the SPSS statistical software (Norusis, 1993).

7 RESULTS

7.1 Current mental disorders among young adults

7.1.1 Current prevalences of DSM-IV Axes I and II disorders

A total of 23.8% of subjects (N=80 of 245; 74 screening positives + 6 screening negatives) were diagnosed to suffer at least one current (1-month) DSM-IV Axis I or II disorder: 20.2% of males (N=21 of 73; 18 positives + 3 negatives) and 26.1% of females (N=59 of 172; 56 positives + 3 negatives). The respective prevalences of any Axis I disorder were 22.2%, 18.1% and 24.7% (Study I: Table 1). The most prevalent disorders among females were depressive disorders (12.7%) and anxiety disorders (10.3%), while among males depression, substance abuse and personality disorders were equally prevalent (7.3-7.4%). In females, prevalences of around 5% were found for substance use disorders, eating disorders and personality disorders (Study I: Table 1). Prevalence of current major depression was 7.8% in females and 5.4% in males (Study I: Table I).

7.1.2 Effect of additional criteria in case definition

Several approaches were used in case definition to estimate the effect of additional criteria on prevalence rates. Table 2 in Study I shows the prevalence estimates for the major diagnostic categories, and separately for depressive disorders, according to whether case definition was based solely on DSM-IV symptom criteria or whether additional criteria were also applied.

As shown, incorporating at least moderate impairment (GAF score 60 or less) in diagnostic criteria dropped the total prevalence of any current psychiatric disorder from 24.0% to 10.3%, and that of e.g. major depression from 6.9% to 3.7%. When need for treatment was required for diagnosis, prevalences of 17.9% for any psychiatric disorder and 5.5% for major depression were gained; requirement of

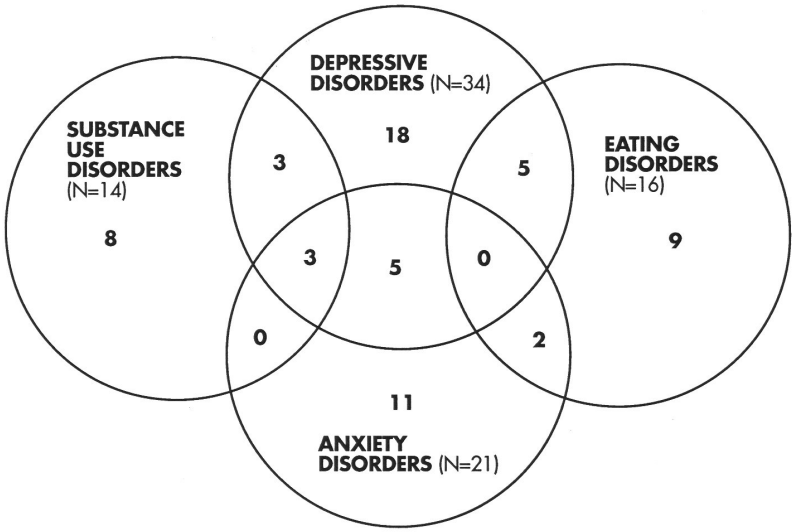
severe treatment need produced prevalences of 5.0% and 2.3%, respectively (Study I: Table II).

7.1.3 Psychiatric comorbidity

Due to low number of males in some disorder categories, specific comorbidity rates (for current DSM-IV Axis I or II comorbidity) are shown only for the most prevalent disorders, by gender (Study I: Table 3). Of subjects with any psychiatric disorder, 35% (N=28 of 80) were diagnosed to have at least two current disorders, and 11% (9/80) three or more. No gender difference was found in the proportion of comorbid disorders (33% in males and 36% in females) (Study I: Table 3).

Figure 2 illustrates the overlap between the four major Axis I disorder categories. There was also overlap within disorder categories. For example, five subjects were diagnosed both dysthymia and MDD.

Figure 2: Overlap between the four major current Axis I disorder categories among young adults



All subjects with comorbid disorders, independent of diagnosis, showed at least mild impairment (GAF < 71) in functioning (Study I: Table 3). The mean GAF score for subjects with a comorbid disorder was 53.1 (SD 6.9) and for those with only one disorder 65.0 (SD 7.3) (mean difference –11.9, 95% CI [-15.2, -8.7], p<0.0001). Severe need of psychiatric care was determined in 61% of subjects with comorbid disorders (N=17 out of 28) versus 10% of those with single disorders (5 out of 52) (p<0.0001, Fisher´s exact test).

7.1.4 Psychosocial impairment in mental disorders

The mean GAF score for subjects (N=80) with any current disorder was 60.4 (SD 9.2). The lowest mean GAF scores (mean GAF score with standard deviation in parentheses) were found for depressive disorders (57.3 [7.8]), anxiety disorders (57.8 [9.6]), substance use disorders (57.4 [8.4]), and personality disorders (56.6 [9.9]). Of subjects with any disorder 91% showed at least mild impairment (GAF<71), and more than half at least moderate impairment (GAF<61) (Study I: Table 3). The mean GAF for subjects with no current DSM-IV disorder was 79.3 (SD 7.5): 82.5 (SD 6.9) in males (N=52) and 77.8 (SD 7.4) among females (N=113), 13% (N=22 of 165) displaying mild impairment (GAF 61-70).

7.1.5 Need and use of mental health services

Need for psychiatric treatment was assessed in almost four fifths and severe need of psychiatric care in over one fourth of subjects with any DSM-IV diagnosis. Severe need of psychiatric care was found in nearly half of those with MDD, dysthymia, anxiety disorder, eating disorder or personality disorder (Study I: Table 3).

One third of subjects with any DSM-IV Axis I or II disorder had contacted mental health services at some phase during the current episode, and ongoing treatment contact was reported by 16% (Study I: Table 4).

Compared to subjects with a disorder but no contact with mental health services during the current episode, those with contact were discovered more often to exhibit a comorbid disorder (N=16 of 26 versus N=15 of 54, chi-square 8.4, df 1, p=0.004) and had a lower mean GAF score (mean GAF 57.0 versus 62.0, mean difference -5.0 (SD 2.1), 95% CI [–9.3, -0.8], p=0.02).

7.1.6 Current depressive disorders: prevalence and clinical correlates

Current depressive disorder (MDD or dysthymia) was diagnosed in 9.6% (95% CI [5.7,13.5]): 6.7% (95% CI[0.8,12.6]) among males (N=7; 6 positives+1 negative) and 11.3% (95% CI[6.0,16.5]) among females (N=27; 26 positives+1 negative), the female to male ratio being approximately 1.7:1. The somewhat higher prevalences of depressive disorders in Table 1 in Study I are due to five subjects with both MDD and dysthymia, since the table shows prevalence estimates for separate disorders, including subjects with several disorders.

All subjects with a depressive disorder were at least mildly (GAF<71) and more than two thirds at least moderately impaired (GAF<61)(Study I: Table 3). Of subjects with current MDD or dysthymia, 59% had another current disorder. The most common concurrent disorders were anxiety disorders (N=8), followed by substance use disorders (N=6), eating disorders (N=5) and personality disorders (N=4). Double depression was discovered in five subjects (15% of all depressive disorders). One third (N=7 of 20) of subjects with a comorbid depressive disorder had more than one comorbid disorder.

Comorbidity was related significantly to the degree of impairment: the mean GAF score for a comorbid depressive disorder was 53.0 (SD 6.1), compared to 63.4 (SD 5.5) for a non-comorbid disorder (mean difference –10.5, 95% CI [-14.6, -6.3], p<0.001). At least moderate impairment (GAF<61) was found in 95% of subjects with a comorbid and in 36% of those with a non-comorbid depressive disorder (p<0.001, Fisher´s exact test). All subjects with a comorbid depressive disorder were estimated to be in need of psychiatric treatment, and severe need of psychiatric care

was assessed in 65%. Eighty-six percent of non-comorbid depressive disorders were estimated to need treatment (Study I: Table 3). Contact with mental health services during the current episode of depression was reported by one half, and ongoing treatment contact by less than one fifth of subjects with a depressive disorder (Study I: Table 4).

7.2 Prevalence of 12-month depression, need and use of mental health services and psychosocial impairment relating to depression

7.2.1 Prevalence of 12-month depression

12-month prevalences of DSM-IV depressive disorders (MDD, dysthymia, depressive disorder NOS) and adjustment disorders with depressed mood are presented in Table 1 in Study II. When based only on DSM-IV symptom criteria, 15% of subjects were diagnosed with a 12-month depressive disorder, and 18% with either depressive disorder or adjustment disorder with depressed mood, together constituting the depressive syndrome. Prevalences dropped by more than one third when psychosocial impairment (GAF score <61) was required for caseness (Study II: Table 1).

MDD and dysthymia were two (MDD with or without impairment, DY without impairment) to more than three (DY with impairment) times more common among females. Depressive disorder NOS was diagnosed entirely in females. Adjustment disorders were similarly prevalent in both sexes (Study II: Table 1).

7.2.2 Comorbidity in depressive disorders

Approximately two-thirds of subjects with MDD, three-fourths with dysthymia and half with depressive disorder NOS were diagnosed with at least one other 12-month DSM-IV disorder (Study II: Table 2). These rates include eleven subjects with both MDD and DY. All but one adjustment disorders were non-comorbid, the exception

being comorbid with a personality disorder. Of all comorbid disorders, one third (12/33) were comorbid with more than one disorder.

The disorders comorbid with MDD were dysthymia in almost one third (N=11), anxiety disorders (N=10), eating disorders (N=7), substance use disorders (N=5), personality disorders (N=5), and identity disorder (N=1). Comorbid disorders in dysthymia were MDD in almost two thirds (N=11 of 17), anxiety disorders in five, eating disorders in three, substance use disorders in two subjects, and personality disorder in one. Two subjects with depressive disorder NOS had a comorbid eating disorder and one a personality disorder.

Adequate data on temporal order of disorders were obtained in 22 of 25 subjects with a 12-month depression comorbid with any other Axis I non-affective disorder. The majority of subjects (86%) (19/ 22) reported at least one other Axis I disorder preceding depressive episodes. Anxiety disorders preceded depression in 78% (7/9), eating disorders in 89% (8/9), and substance use disorders in 80% (4/5) of subjects with depression comorbid with these disorders.

7.2.3 Psychosocial impairment and need for treatment in 12-month depression

Subjects with comorbid depressions showed significantly lower mean GAF scores than those with non-comorbid depressions (Study II: Table 2), and subjects with more than two comorbid disorders (N=12) were significantly more impaired than those (N=21) with only one comorbid disorder (mean GAF scores 47.5 versus 55.2, mean difference 7.7, 95%CI [3.6,11.8], p=0.001). Gender difference in impairment among subjects with any type of depression (N=67) was non-significant (mean GAF of females 56.8 (SD 7.8) versus mean GAF of males 54.1 (SD 15.8), p=0.5).

Of subjects with a depressive disorder, all but one with a comorbid disorder and two-thirds of those with a non-comorbid disorder were estimated to be in need for psychiatric treatment. All subjects with dysthymia and more than four fifths of those

with MDD were considered in need of psychiatric care, contrasting with only two subjects with an adjustment disorder with depressed mood.

7.2.4 Psychiatric help-seeking among depressed young adults

7.2.4.1 Use of psychiatric services

All prior psychiatric contacts had occurred during adolescence or early adulthood, the mean age of first treatment contact being 19.8 years (SD 1.8, range 16-23 years): 20.5 (SD 0.6) in males and 19.7 (SD 1.9) in females.

Treatment contacts during the index (12-month) episode were reported by approximately one third and any prior contacts by one half of subjects with any type of depression (Study II: Table 3). Subjects with dysthymia were the most and those with an adjustment disorder the least likely to report treatment seeking. Probability of treatment contacts increased by severity of disorder as measured by the level of impairment, comorbidity, and estimated need for treatment. The effect of comorbidity was more evident than that of impairment in determining treatment seeking: approximately one half of subjects with comorbid depression compared to one third of those with at least moderate impairment reported psychiatric treatment contacts during the index episode (Study II: Table 3). Treatment seeking rates in adjustment disorders resembled those of the non-comorbid MDD.

7.2.4.2 Intention to seek help

One third of subjects with any type of depression had never intended to contact mental health services for their problems (Study II: Table 3). Among those with no prior contacts, intention to treatment seeking was the least frequent among subjects with adequate overall psychosocial functioning and non-comorbid depression. Again, comorbidity emerged as more important than impairment in determining treatment

intention: nine in ten subjects with a comorbid depression compared to four in five of those with impairment (GAF<61) had at least considered contacting mental health services (Study II: Table 3).

7.2.4.3 Gender differences in treatment seeking

Treatment contacts during the index episode were reported by an approximately equal proportion (one third) of both sexes, except for dysthymia, concerning which females were more likely to seek treatment than males (Study II: Table 4). The overall rate of previous treatment contacts was, however, higher among females than males. Males were more likely than females (half versus a third) not even to have considered referring to mental health services for their problems; of females with no previous contacts one half had at least considered contacting services. This overall gender difference was even more obvious in MDD: although males and females reported treatment contacts during the index episode equally often, almost two-thirds of females had previous contacts and only one sixth had never considered referring to services for their problems. Males with MDD reported no other treatment contacts than those during the index episode, and half of males with MDD had never considered seeking psychiatric help (Study II: Table 4).

7.2.4.4 Subjects with double depression: a subgroup in particular need of care

More than two-thirds of subjects with dysthymia (N=11/17) were also diagnosed an episode of MDD. This group, all in need of psychiatric care, was distinguished from other depressions by particularly low mean GAF scores (mean 48.5, SD 4.3, range 42-55). Treatment contacts were reported by all but one, and contact during the index episode by almost two thirds (N=7).

7.3 Assessment of major depressive episode (MDE) among young adults: CIDI-SF versus SCAN consensus diagnoses

Forty subjects out of 239 (17%) were assigned a SCAN consensus MDE diagnosis during the past 12 months (Study III: Table 1). Any other (one or more) diagnosis was discovered in 54 subjects; 145 received no DSM-IV diagnosis. The CIDI-SF identified 65 subjects (27%) with MDE.

Of the 40 subjects with SCAN consensus MDE, the CIDI-SF correctly identified 29 ("true positives"), leaving 11 subjects undiagnosed ("false negatives"). Of the 199 subjects with no SCAN consensus MDE diagnosis, the CIDI-SF detected 36 ("false positives"); 163 subjects were not identified by either instrument ("true negatives"). Agreement between instruments was modest: kappa nonweighted 0.44, kappa weighted 0.39, sensitivity 0.73, and specificity 0.82 (Study III: Table 1).

The 29 true positive subjects were notably affected by their MDE: at least moderate psychosocial impairment and a comorbid disorder were discovered in more than two-thirds, and almost all were estimated to need psychiatric care (Study III: Table 2).

Among the false negative subjects, the majority were clearly impaired, almost half of the disorders were comorbid, and three fourths were estimated to need psychiatric care (Study III: Table 2). Indeed, no statistically significant differences were found between the false negative and the true positive groups regarding the correlates of MDE (Study III: Table 2). Further analyses revealed that out of the 11 false negatives, nine had answered "no" to the very first stem question: one failed to meet the diagnostic criteria due to the low total depressive symptom score, and one due to the short daily duration of symptoms.

The false positives (N=36) differed significantly from the true positives. The proportions of subjects with at least moderate impairment (22%), treatment need (33%), and comorbidity (11%) were considerably smaller than among the true positives or false negatives (Study III: Table 2). Case-by-case analysis of these

subjects revealed that at the diagnostic level, almost half (44%, N=16) actually had a mood disorder other than MDE: dysthymia (N= 4), depressive disorder NOS (N=3), or adjustment disorder with depressed mood (N=9). Reanalyses by comparison of CIDI-SF MDE to SCAN consensus mood syndrome resulted in higher specificity (0.90) and better agreement (kappa nonweighted 0.61, weighted 0.54) (Study III: Table 1).

To study the effect of tightening the caseness criteria of CIDI-SF MDE on accuracy rates, we performed reanalyses with higher CIDI-SF cutpoints than the suggested three symptoms. By cutpoint four 57 subjects were identified, with kappa (nonweighted) 0.47, sensitivity 0.70, specificity 0.85; by five 46 subjects with kappa 0.60, sensitivity 0.60, specificity 0.89; by cutpoint six 29 subjects with kappa 0.34, sensitivity 0.38, and specificity 0.89.

7.4 Adolescent depressive symptoms predicting early adulthood depression

Baseline depressive symptoms were reported by 112 of the 651 questionnaire respondents (17%) and 60 of the 245 interviewed (24.5%).

Depressive symptoms predicted increased risk of psychiatric disturbance and problem drinking in young adulthood (Study IV: Table 1). Analyses of the diagnostic data revealed that adolescent depressive symptoms predicted a two-fold risk of any DSM-IV Axis I disorder and a six-fold risk of any two co-occurring DSM-IV Axis I disorders. Compared with adolescents not reporting depressive symptoms, the risk of early adulthood depressive disorders (MDD or dysthymia) was 3-fold, and that of psychosocial impairment 3.5-fold among those with depressive symptoms.

8 DISCUSSION

8.1 Overview of results

A central finding in the present study was that one in ten young adults aged 20 to 24 years was diagnosed to suffer from a current DSM-IV disorder with associated impairment. Depressive disorder was the most common disorder in both sexes. More specifically, the 12-month prevalence of depression was high, with 12.3% meeting DSM-IV criteria for major depression, 3.9% for dysthymic disorder, and 18.1% for any type of depression including adjustment disorders with depressed mood. Mental disorders were often comorbid and impairing, and generally more prevalent among females. Comorbidity was associated with greater impairment and treatment seeking.

Young adults diagnosed with mental disorders were severely undertreated: One third of young adults with any DSM-IV disorder, and half of those with a current major depression had contacted mental health services during the current episode.

In evaluating clinical significance of disorders, it was found that use of additional criteria in case ascertainment notably influenced the prevalence estimates for disorders: overall prevalences dropped almost by half when impairment in psychosocial functioning as measured by a GAF score 60 or less was required for diagnosis.

Another main finding was that adolescent depressive symptoms predicted a high risk of depression, psychiatric comorbidity and psychosocial impairment in early adulthood as well as problem drinking.

The results on the applicability of the CIDI-SF interview in detecting major depression attain more general interest as they supplement data on correspondence between a brief, highly structured interview instrument to a structured diagnostic instrument close to clinical decision-making procedure. The correspondence between the CIDI-SF diagnoses of major depression and the SCAN consensus MDE

diagnoses was found to be modest, but better when the CIDI-SF was compared to the SCAN consensus mood syndrome diagnosis.

8.2 Prevalence of mental disorders

Prevalence data specifically on young adults, relying on standardized psychiatric interviews and operationalized diagnostic criteria according to the DSM-classification, have previously emerged from very few studies (Newman et al., 1996; Kessler and Walters, 1998). These studies have shown prevalences of mental disorders to peak in late adolescence and early adulthood (Newman et al., 1996; Kessler and Walters, 1998), underscoring the need for more research in this age group.

The present study found a quarter of Finnish young adults with high-school background to currently suffer from at least one DSM-IV psychiatric disorder. Keeping in mind that structured interviews tend to give higher prevalence estimates than semistructured interviews (Roberts et al., 1998), this finding is in accordance with previous studies reporting 12-month prevalence estimates of 40.4% among 21-year-olds (Newman et al., 1996), 36.6% among 18-year-olds (Feehan et al., 1994), and 37% and 28.9% in mixed mid-adolescent-young adult samples by Kessler et al. (1994) and Wittchen et al. (1998), respectively. In mixed late adolescent-young adult samples, current- to six-month prevalences of 10% (Canino et al., 1987) and 17% (Regier et al., 1993) have earlier been found.

In accord with previous studies (Regier et al., 1993; Feehan et al., 1994; Kessler et al., 1994; Newman et al. 1996; Wittchen et al. 1998), the three most common disorder categories were depressive disorders, anxiety disorder and substance use disorders. As previously (Feehan et al., 1994; Newman et al., 1996), depression and anxiety disorders were more prevalent among females, while substance use and personality disorders were more prevalent among males. The present study also parallels previous studies, with the exception of the study by Wittchen et al. (1998), in documenting the overall prevalence of having a psychiatric disorder to be higher in females.

Due to the small number of interviewed males in our study, the low prevalence estimates for anxiety disorders among males need to be interpreted with caution. Anxiety disorders might have been less common than average among those who volunteered for interviews. Earlier, prevalences of anxiety disorders have ranged from a current estimate of 3.2% in mid-adolescents (Lewinsohn et al., 1993) to a 12-month estimate of 9.3% among 15-24-year-olds (Wittchen et al., 1998). As for substance use disorders, our current prevalence of 6.2% is comparable with 12-month prevalences of 11.4% in 15-24-year-olds (Wittchen et al., 1998), 10.4% among 18-year olds (Feehan et al., 1994) and 9.8% in 21-year-olds (Newman et al., 1996). Finally, the relatively high rates of eating disorders in the present sample may partly be due to its urban setting.

8.3 Prevalence of depression

For major depression, previous studies have reported 12-month prevalence estimates of 15.6% (Kessler and Walters, 1998) and 16.8% (Newman et al., 1996) among 21-22- year-olds, 9.4% among 20-24-year-olds (Haarasilta et al., 2001), 5.3% among 15-24-year-olds (Wittchen et al., 1998), and 2.9% among 18-29-year-olds (Robins and Regier, 1991). In the NCS, current major depression was more prevalent among 21-22-year olds (7.7%) than in either somewhat younger (4.7%) or older (2.9%) age groups (Kessler and Walters, 1998).

The current and 12-month estimates of 6.9% and 12.3%, correspondingly, for major depression found in the present study are in line with those from young adult samples by Newman et al. (1996), Kessler and Walters (1998) and Haarasilta et al. (2001), but considerably higher than the estimates from a mixed adolescent-young adult sample by Wittchen et al. (1998), or the young adult samples by Robins and Regier (1991) and Canino et al. (1987). Earlier, the unusually low prevalence rates of major depression in the ECA study (Robins and Regier, 1991) have raised doubts of methodological problems in that study (Blazer et al., 1994). The study by Canino et al. (1987) replicated the general methodology of the ECA study. Prevalence of

dysthymia in the present study (both current and 12-month 3.9%) was slightly higher than the range 2.2%-3.0% previously reported (Regier et al., 1993; Newman et al., 1996; Wittchen et al., 1998). Congruent with most prior studies, the female-to-male sex ratio in major depression was approximately 2:1.

The 12-month prevalence of any depressive condition, including also adjustment disorders with depressed mood (constituting the depressive syndrome) was 18.1% (21.8% in females and 12.2% in males). Adjustment disorders with depressed mood differed from major depression in not showing the gender difference characteristic of depression but being as common in both sexes, and only one subject with an adjustment disorder showing comorbidity as opposed to the highly comorbid major depression, as well as in comprising a smaller proportion of those with at least moderate impairment or treatment need.

8.4 Clinical significance of disorders

It is well recognized that meeting the diagnostic symptom criteria of a disorder is not equivalent to needing clinical attention, and indeed several studies have reported adolescents meeting the operational diagnostic criteria for a depressive disorder to function relatively well (Roberts et al., 1998). Moreover, studies on non-clinical samples may overdiagnose milder disorders such as depression by diagnosing milder forms of the same disorders seen in clinical settings, or syndromes illustrating the boundary between mental disorder and psychological health (Regier et al., 1998; Spitzer, 1998). This issue is of importance not only when it hampers comparison of results across studies but also in the sense of providing reliable and clinically valid prevalence data for service planning and prevention purposes. Therefore, although the concept of clinical significance is difficult to operationalize, it has been emphasized that caseness in epidemiology should best be determined by the presence of both symptoms and impairment (Roberts et al., 1998).

Accordingly, Narrow et al. (2002) reported revised prevalence estimates of mental disorders basing on the two large adult general population studies, the NCS (Kessler

et al., 1994) and the ECA (Robins and Regier, 1991). Responses to questions on life interference from, telling a professional about, or using medication for symptoms were applied to cases meeting symptom criteria of each of the studies. Clinical significance was thus related to concepts of symptom severity, impairment of functioning, and perceived treatment need. Using clinical significance criteria lowered disparities between prevalence estimates in the two surveys. In particular, the recalculated prevalence rates of 12-month major depression (5.4% in the NCS and 4.6% in the ECA) showed no longer a statistically significant difference (Narrow et al., 2002). The authors concluded that establishing the clinical significance of disorders in the community is crucial for estimating treatment needs due to these disorders.

Also the present study reported separate prevalence estimates for disorders with and without impairment. Based entirely on DSM-IV symptom criteria, current prevalence estimates of 23.8% for any mental disorder and 6.9% for major depression were calculated. Using additionally impairment criteria to produce estimates of clinically significant disorders produced rates of 10.3% and 3.7%, correspondingly. Of note is that incorporating impairment criteria in caseness seemed to solve the issue of whether to include adjustment disorders when estimating the prevalence of depression: the total prevalence of depressive disorders was very close to that of depressive syndrome when impairment was included in case definition.

8.5 Psychiatric comorbidity

Earlier studies have described considerable comorbidity in mental disorders, and this was evident in the present study, too. General population studies have reported nearly half of young people with psychiatric diagnoses to have more than one concurrent disorder (Regier et al., 1993; Kessler et al., 1994; Newman et al., 1996), of whom one fifth up to one half are estimated to have more than one co-occurring disorder (Birmaher et al., 1996). The present study produced a current overall comorbidity rate of 35% across major disorder categories. The twelve-month comorbidity rate of major depression (64%) of this study and the corresponding rates

from the NCS (63%) and the Dunedin study (67%) are remarkably similar (Newman et al., 1996; Kessler and Walters, 1998), suggesting that comorbidity in depression among young adults is rather the rule than an exception. Also congruent with previous studies (Kessler et al., 1994; Newman et al., 1996; Wittchen et al., 1998) this study found young adults with a comorbid disorder to exhibit the poorest psychosocial functioning. As before (Rohde et al., 1991; Garrison et al., 1992; Birmaher et al., 1996), young people with double depression were found to constitute a subgroup of particularly severe depression in terms of their poor psychosocial functioning.

In line with previous findings on adolescent (Birmaher et al., 1996) and young adult (Kessler and Walters, 1998) populations, depression tended to be secondary to other disorders. Data are, however, inconsistent on the temporal order of depression and substance use disorders, in both adolescents and adults (Reinherz et al., 1993a; Biederman et al., 1995; Brook et al., 1998). The present study found substance use disorders to precede depression, but e.g. Kessler and Walters (1998) reported depression to precede substance use disorders among young adults in the much larger NCS sample.

8.6 Need and use of psychiatric services among young adults

Previous studies have documented less than half of adolescents (McGee et al., 1990; Whitaker et al., 1990; Fergusson et al., 1993; Gomez-Beneyto et al., 1994; Wittchen et al., 1998) or young adults (Newman et al., 1996; Kessler et al., 1996) suffering from mental disorders to have contacted treatment services. Findings of the present study indicated similar undertreatment: Of young adults with any current DSM-IV disorder with or without impairment, one in five had an ongoing treatment contact at time of interview, and treatment contact at any phase of the current disorder was reported by one third. In the present study, approximately half of young adults diagnosed with depression, anxiety or eating disorders had ever contacted mental health services, while only one in five of those with a substance use disorder reported having sought treatment. These disorder-specific contact rates parallel findings from earlier studies in showing higher treatment contact rates for subjects diagnosed with

depression and anxiety compared to those with substance use disorders (Newman et al., 1996; Kessler et al., 1998b; Kessler et al., 1999).

8.7 Treatment seeking in depression

Given that early onset of depression is associated with particularly increased risk of persistence, recurrence and impairment (Giaconia et al., 1994; Kovacs, 1996), the data on prevalence and correlates of treatment utilization in early adulthood depression are of critical importance. Prompt treatment of early-onset depression may have a significant impact on the likelihood of occurrence of depression later in life (Harrington and Clark, 1998), and thus, paradoxically, play an important role in prevention of depression.

The present study adds to the previous findings on overall low treatment utilization, with less than half of those diagnosed with a 12-month clinically significant major depression receiving some kind of mental health treatment during their episode. Unlike studies reporting contact rates for the past year (Newman et al., 1996; Kessler and Walters, 1998; Kessler et al., 1999) or over the lifetime (Wittchen et al., 1998), this study reported contacts that occurred during the index depression episode, including those before the past year if made during the course of the episode. Rates for past year treatment contacts would have been somewhat lower than the ones reported here, especially concerning dysthymia. The data do not reveal how many of those contacting services actually received proper treatment for their depression, but only to what extent depressed late adolescents and young adults sought mental health services during the course of their depression, and to what degree the seriousness of depression determined treatment seeking.

The episode-related contact rates of 39% for 12-month major depression and 53% for dysthymia in the present study are well in line with the past-year contact rates of 37.3% for MDE and 50.0% for dysthymia documented among 21-year-olds by Newman and colleagues (1996). Among the 15-24-year-olds in the NCS (Kessler et al., 1999), reported treatment rates were lower (26.7% for major depression and

26.0% for dysthymia), as were lifetime rates of 24% for single and 40% for recurrent major depression, and 46% for dysthymia in a mixed adolescent-young adult sample (aged 14-24) reported by Wittchen and colleagues (1998). The ECA Study reported that approximately one half of the whole sample aged 18 years or more with major depression or dysthymia had used psychiatric services during the past year (Narrow et al., 1993; Regier et al., 1993).

8.8 Factors affecting treatment seeking in depression

As previously reported (Rohde et al., 1991; Regier et al., 1993; Birmaher et al 1996; Newman et al., 1996; Wittchen et al., 1998; Kessler et al., 1999), severity of depression was related to treatment use as measured by the level of impairment or comorbidity in disorders. The greater the estimated level of impairment or number of disorders, the greater was the proportion of subjects with contacts within each disorder category, and the smaller the proportion of those with no prior intention to seek help. The role of comorbidity was evident in that while half of subjects with a comorbid 12-month depression reported treatment seeking during the index episode, only one in ten with a non-comorbid depression had sought psychiatric help. Also congruent with previous findings among adolescents (Lewinsohn et al., 1994) and adults (Weissman et al., 1988), the probability of treatment seeking seemed to relate to the duration of depression: dysthymia associated with the highest and adjustment disorders with the lowest contact rates, possibly indicating that the level of distress was increased by the persistence of underlying depression.

In addition to the clinician-defined need relying on interview data, the subjects´ self-reported intention to seek treatment was evaluated to give a truthful picture of perceived need for help among those diagnosed with depression but reporting no treatment contacts. One third of subjects with any type of depression had never considered contacting mental health services. This may indicate that many subjects with depression according to DSM-IV symptom criteria experience no need for professional help for their symptoms, giving further support for the use of additional diagnostic criteria in producing clinically significant prevalence data. On the other

hand, the discrepancy between rates of depression and treatment seeking may reflect the inability of young adults, particularly males, to recognize their depression.

Comorbidity seemed to relate to treatment seeking (both contacts and intention) more clearly than psychosocial impairment, which finding further emphasizes the importance of exposing comorbidity in clinical practice to identify subjects with the most severe depressions. Similarly to those with fulfilled contacts, among subjects with depression but no treatment contacts those diagnosed as dysthymic showed the most and those with adjustment disorders the least intention to refer to services.

The total prior contact rates were higher among females. Moreover, young adult males were more likely not even to have thought of referring to mental health services. These findings are conguent with earlier evidence (Saunders et al., 1994; Kessler et al., 1998b) suggesting females to be more likely to identify their mental problems. With the exception of subjects with dysthymia, however, no gender difference was found in rates of episode-related treatment contacts. The findings of the present study also agree with those by Saunders et al. (1994) in showing that while females were more likely to recognize a need for help, males and females were equally likely to obtain help after need had been identified.

Generally, these findings highlight the gap between need for treatment and use of services among young people, and call for more research on possible personality, socioeconomic, and other factors influencing treatment seeking behaviour in this age group. Among issues needing further clarification is the question of which factors determine the ability of young people themselves to identify their treatment need. Equally important would be to evaluate whether existing treatment resources could be targeted more adequately to meet the treatment needs of this particular age group.

8.9 Detecting depression: the CIDI-SF versus the SCAN

The correspondence between CIDI-SF major depression and SCAN consensus MDE was modest. Almost one third of subjects diagnosed with SCAN consensus MDE remained unidentified by the CIDI-SF, majority being subjects with notable psychosocial impairment and psychiatric treatment need. Comparison to SCAN consensus mood syndrome diagnosis produced better correspondence.

Recall error, although generally considered among threats to validity (McLeod et al., 1990; Wittchen et al., 1999) seems unlikely to explain inconsistencies in the present study, since CIDI-SF was preceded by SCAN, which already had encouraged respondents to discuss their depression. Question misunderstanding, reportedly a problem in highly structured interviews (Brugha et al., 1999a), may be a more probable explanation, as the thorough approach of the SCAN allows the interviewer to ensure the correct interpretation of questions, which is not possible when administering the CIDI-SF.

Alternatively, respondents may have failed to duplicate aknowledgement of their episodes as they were too tired or otherwise reluctant to rediscuss their depression (McLeod et al., 1990; Wittchen et al.,1999). Having already completed the SCAN, subjects may have thought that by answering ”no” to stem questions they could avoid being asked further related questions. This would partly explain why almost all the false negative subjects had answered negatively to the very first CIDI-SF stem question. That the female-to-male ratio in depression increased from the approximately 2:1 based on SCAN consensus diagnoses to 4:1 based on CIDI-SF raises the possibility of gender difference in reporting depressive symptomatology when assessed by a highly structured instrument. On the other hand, some of the false positives may be subjects incorrectly unidentified by the SCAN: the risk of embarrassment influencing responding, for example, may be smaller in highly structured interviews as these allow more separation between the respondent and the interviewer (Wittchen et al., 1999).

That random ordering of instruments was not applied precludes evaluation to what extent the completion of the CIDI-SF was influenced by the preceding SCAN. A study comparing SCAN and CIDI with random ordering of instruments revealed lower concordance when CIDI followed SCAN (Brugha et al., 2001). The impact of the order of the applied instruments on results should indeed receive more attention in future studies. The close time proximity between interviews is reportedly an advantage (McLeod et al., 1990); yet in the present study it precluded blind administering of the following CIDI-SF. On the other hand, some justification for introducing CIDI-SF after SCAN derives from the reportedly high reliability of the CIDI (Andrews et al., 1995), suggesting that it should not be open to interpretation by the interviewer.

Milder forms of disorders predominate in community samples (Regier et al., 1998), emphasizing the importance of correct classification of threshold cases. In the SCAN consensus procedure, this issue was particularly paid attention to. High sensitivity is, however, difficult to obtain with highly structured interviews (Regier et al., 1998; Brugha et al., 1999b). The importance of threshold disorders is seen in that almost half of the false positive subjects were diagnosed other mood disorders than MDE. Likewise, in a recent study many endorsed CIDI items were judged as subthreshold by SCAN (Brugha et al., 2001).

In contrast to earlier studies comparing CIDI-SF to CIDI (Patten et al., 1997, Kessler et al., 1998b), this study used a semistructured interview as the “gold standard”. Generally, levels of concordance between structured and clinical interviews among non-clinical samples tend to be poor (Brugha et al., 1999a). Recently, Brugha and colleagues (2001) compared CIDI and SCAN and reported kappa of 0.15 for depressive episodes and 0.39 for any depressive disorder. As in the present study, kappa values first improved when raising the threshold for CIDI diagnosis but then worsened probably reflecting the influence of prevalence rates on kappa values (Brugha et al., 2001). This study also found a steady increase in specificity and a decrease in sensitivity by higher cutpoints.

In another study, also congruent with present findings, comparison of SCAN to DIS (Diagnostic Interview Schedule) (Robins et al., 1981) produced only fair agreement in

assessing MDE, but better when diagnostic thresholds were set at the level of depressive syndrome rather than specific diagnosis (Eaton et al., 2000). Using broader syndromal diagnosis instead of MDE may, however, involve problems, because in SCAN e.g. symptoms of dysthymia are inquired using clinical checklists instead of formal rating of symptoms. Little work on the reliability of these aspects has yet been done.

8.10 Predictive significance of adolescent depressive symptoms

Using prospective data, the present study showed depressive symptoms in adolescence to predict a high disorder-specific risk of depression and impairment. Through their association with comorbidity, depressive symptoms seemed linked to the severity of disorders. Symptoms of depression in adolescence also predicted subsequent psychiatric disturbance and problem drinking. These results agree with prior findings (Kandel and Davies, 1986; Gotlib et al., 1995; Pine et al., 1999; Lewinsohn et al., 2000c) in showing the important predictive impact of adolescent depressive symptoms on subsequent depressive disorders, psychosocial impairment and problem drinking.

Depression has shown to manifest itself in all grades of severity, each with significant morbidity, and mild forms tend to lead to more severe forms of depression (Harrington and Vostanis, 1995). Majority of first episodes of major depression occur in individuals who have prior depressive symptoms (Horwarth et al., 1994). It is therefore considered important that preventive programmes should deal with the whole spectrum of depression, not just focus on depression as a disorder (Harrington and Clark, 1998). Long-term follow-up and reevaluation of adolescents presenting with moderate to severe depressive symptoms has been considered warranted (Rushton et al., 2002). Moreover, since symptoms of depression seem to predict future depressive disorders (Lewinsohn et al., 1994), prevention efforts should be targeted to adolescents who exhibit depressive symptoms but have not yet developed the disorder. Such interventions have gained promising results (Clarke et al., 1995). From these points of view, the other principal finding of the study suggesting a

simple two-item measure to offer one possibility to identify adolescents at risk is encouraging. School environment might provide a natural setting in which such screening could take place.

8.11 Methodological considerations

The diagnostic data collection in the present study applied a two-stage approach: Stage 1 screening process was designed to identify individuals likely to have mental disorders. At stage 2, those identified were interviewed using a semistructured interview. In such a procedure, the type of the stage 1 screening instrument has impact on the pattern of associations found at the second stage. Being well-validated and widely used, as well as sufficiently sensitive and specific, the General Health Questionnaire (GHQ) was applied as the main screening instrument for diagnostic interviews (Goldberg et al., 1997). Interviews of a random sample of screening negative respondents were also included, which enabled calculating corrected prevalence figures.

Among other methodological strengths are the relatively large sample size and the diagnostic procedure which also included the evaluation of the level of subjects´ psychosocial functioning. In this procedure, SCAN interview was first applied to ensure reliable data collection. Thereafter, all cases, including all subclinical cases, were discussed at least twice between the diagnostic team allowing clinical judgement to specify the research diagnoses, although DSM-IV criteria were strictly adhered to. The careful case ascertainment together with the use of best-estimate diagnoses to complete diagnostic data from standardized interviews have probably helped to improve the validity of the research diagnoses and to minimize overdiagnosing milder forms of disorders common in general population studies (Regier et al., 1998).

Among the major weaknesses are problems in sample representativeness. The sample comprised young people with urban or suburban high-school backgrounds, being thus not fully representative of all Finnish 20-24-year-olds. Also, the number of interviewed males was relatively low, so interpreting results concerning gender

differences requires caution. Due to the high-school background of the subjects, the rates of e.g. depression may be underestimates since high-school dropouts and non-attenders are omitted. Hankin and his colleagues (1998) have, however, reported depression rates, accompanying gender difference, and the timeline of the emergence of the gender difference in depression to be similar in a university student sample compared to a non-student sample, supporting the external validity of the results of the present study. As for the findings concerning psychiatric treatment seeking, the generalizability of these results may be limited due to the present study group consisting of relatively well-educated and urban young people, both factors that associate with increased likelihood of treatment seeking (Kessler et al., 1998b). Also, males and females in the present study may represent more homogenous attitudes towards treatment seeking than generally prevail. Additionally, young people studying at universities in Finland have easier than average access to mental health specialty services, which may have influenced the help-seeking behaviour of these subjects.

Another limitation of the study is the relatively high attrition along the follow-up, which resulted in an increase in the proportion of females at each stage. Of the original adolescent sample, 47% volunteered for the follow-up, and although the response rate at the follow-up questionnaire stage was as good as 92%, the attrition at the clinical interview stage was substantial. Despite that analyses of the available data revealed no major differences between the respondents and the non-respondents along the three-phase sampling from baseline questionnaire to follow-up interviews, it is likely that factors associating with the risk of psychopathology have affected response readiness, non-respondents probably having increased prevalences of psychiatric symptoms (Blazer et al., 1994). The nonresponse was particularly large among the screening negative respondents. The high attrition among this group is, however, partly artificial since interviewing screening negative respondents was finished when the objective of approximately 40 interviews was achieved. Additionally, in this group, the large nonresponse may to some degree reflect these subjects not being motivated to attend the interview on mental problems because of their good health. Nevertheless, no differences were found between the screening negative respondents interviewed and those invited but not interviewed as regards their sex, age, or the mean GHQ score (data not shown). The limitations in the

representativeness deserve particular attention as the prevalence estimates were calculated in a follow-up sample.

Since data on illness course and prior treatment contacts, as well as the temporal order of disorders were gathered retrospectively, they were sensitive to recall error bias. As for the temporal relationship of disorders, retrospective gathering of these data may be considered justified due to the flexibile and yet thorough questioning of symptoms provided by the SCAN instrument. Moreover, data on the onset and course of each disorder or symptom were reviewed at the consensus meetings.

Case definition concerning DSM-IV Axis II personality disorders is another methodological limitation. On the other hand, previous studies have been inconsistent as to the validity of existant measures of these disorders (Zimmerman, 1994), and the use of the LEAD Standard (Spitzer, 1983) method, in which expert clinical judgement plays a central role, has been recommended (Pilkonis et al., 1991; Grilo et al., 1998). The validity of our results concerning personality disorders is supported by their concordance with previous research (Samuels et al., 1994).

When comparing the CIDI-SF and the SCAN, it is important to note that the SCAN consensus diagnoses may not be regarded as a “golden standard”. The reliability of the SCAN has not been established in general population samples (Wittchen et al., 1999). The careful case ascertainment procedure aimed to overcome this limitation. The comparison of the Short Form MDE basing on DSM-III-R to SCAN consensus diagnoses relying to DSM-IV hierarchy rules involves problems mainly as impairment criteria are incorporated only in the latter criteria. Finally, administering the CIDI-SF after the SCAN with no randomization of the order of instruments may have introduced bias due to order effects.

In evaluating the predictive value of depressive symptoms, lack of diagnostic data at baseline precluded controlling for the presence of depressive disorders at that time. Furthermore, besides depressive symptoms, a range of other factors are probably associated with increased risk of the reported outcomes. On the other hand, few studies as yet have analysed the association between adolescent depressive symptoms and adult depression in epidemiologic samples using prospective longitudinal data on

adolescents during transition to adulthood. That the defined psychiatric outcome based on careful diagnostic case ascertainment was a strenght in these analyses.

8.12 Clinical implications

Understanding the prevalence of disorders as well as distribution of psychopathology among young people is vital to the development and correct targeting of treatment resources. Much of the suffering due to mental disorders could be avoided by prompt interventions if only need for them were recognized.

Not only early identification but also prevention of new episodes of major depression is crucial, especially as psychosocial dysfunctioning seems to particularly threaten youth with recurrent depressions. In prevention of subsequent episodes of depression, proper treatment of the first episode of major depression is essential.

Efforts are needed to develop interventions to reach young people in need of care. Early identification and treatment of depression in youth requires that professionals in different settings (e.g. schools, social services, and primary health care) are familiar with the various manifestations of depressive disorders in adolescence and early adulthood. More specifically, the present study pinpointed two subgroups worth particular attention: First, subjects with double depression appeared to constitute a subgroup with particularly severe depression. Secondly, young males with depression reported no other treatment contacts than those during the index episode. Considering that half of depressed males had never even thought of service use, this implies that initial contacts to services by young men should be taken seriously.

Psychiatric comorbidity distinguished by its associations with greater impairment and more severe need of psychiatric care. Proper assessment of comorbidity may offer a way to identify young adults in most urgent need of treatment. If comorbidity is not recognized, those distressed are unlikely to receive the most effective forms of treatment available.

Findings of this study also gave support to the use of additional diagnostic criteria in assessing mental disorders. Measurement of psychosocial functioning turned out to be an easy way to differentiate clinically significant disorders from less severe ones. Using such additional criteria might also prevent labelling large amounts of individuals in the community who may not perceive themselves as having a mental disorder, experiencing neither impairment in their psychosocial functioning, nor the need for treatment for their symptoms.

Subclinical depressive symptoms in adolescence, not merely clinical depression, should be a focus of further research and clinical interest. Adolescents displaying subclinical depressive symptoms should be targeted more profound clinical attention to evaluate their need of possible interventions. The present study also suggests that a simple two-item measure may identify adolescents at increased risk of subsequent depression and maladjustment. This kind of measure might indeed be useful as a quick screen in situations where the use of a more reliable screening instrument would be out of question, e.g. in school health services or as part of a physical examination of adolescents.

Finally, the findings of the present study support the use of comprehensive, clinical-like interview instruments rather than brief measures in producing reliable diagnoses of major depression.

8.13 Research implications

Data on prevalence and correlates of early adulthood mental disorders serve as important baseline information for future research. While the present study provides data on prevalence of disorders, estimates of associated treatment needs and treatment seeking among young adults, it has not examined e.g. the efficacy of different treatment sources in reaching young people, or analysed the impact of various developmental features or other determinants of help-seeking at this age group. These will indeed be addressed in future analyses of the present data. As yet, many issues

relating to treatment seeking are uncharted, calling for more research focusing on this area.

Another important task for future studies will be to strive for standardizing the criteria for clinical significance of disorders to increase the comparability between studies; as yet no universally accepted criteria exist.

Detailed analyses of comorbidity were not included in these studies. Distinctions of comorbidity between depressive disorders and other major disorder categories need further analyses. The important issue of temporal order of comorbid disorders awaits additional research, preferably in larger study samples.

As the CIDI-SF appeared to function best in identifying a broader category of affective disorders rather than MDE, it might be useful in large-scale community surveys where more extensive psychiatric interviews are not feasible, whereas its value in accurate detection of major depression seems controversial. More research in general population samples is needed on the correspondence between short and more extensive diagnostic instruments. Further, it would be important to aim at developing diagnostic instruments simple enough and reliable enough to be applied in settings such as schools and primary health care to enable early identification of mental disorders. The important issue of order of the applied instruments on results was not examined in the present study, and should be given more attention in future studies.

Finally, research should strive to identify factors and combinations of factors specific to late adolescence and early adulthood that increase the risk of depression and other mental disorders. The present study gave support for subclinical depressive symptoms to be one such factor, but further research, implying longer follow-up periods, is needed to clarify their long-term impact on mental health during the transition to adult life. Research on factors protecting young people from subsequent psychopathology is equally important. Better knowledge on risk factors would not only enable targeted preventive efforts to adolescents exposed to risk, but would also increase our understanding on the etiology of depressive and other mental disorders among young people.

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One-month prevalence of depression and other DSM-IV disorders among young adults

T. AALTO-SETÄLÄ,[1] M. MARTTUNEN, A. TUULIO-HENRIKSSON, K. POIKOLAINEN AND J. LÖNNQVIST

From the National Public Health Institute, Department of Mental Health and Alcohol Research and Finnish Foundation for Alcohol Studies; Helsinki; and Department of Adolescent Psychiatry, Helsinki-Uusimaa Hospital District, Peijas Hospital, Vantaa, Finland

ABSTRACT

Background. We aimed to provide prevalence data on depression and other current mental disorders, impairment, need of psychiatric care and use of mental health services among young adults.

Methods. Based on a semi-structured clinical interview, current DSM-IV disorders, impairment, need of psychiatric care and use of mental health services were evaluated in a sample of 20–24-year-old young urban adults ($N = 245$), mean age 21·8, screened from a baseline population of 706. One-month prevalence estimates for disorders were calculated by the double sampling method, using various additional criteria to identify cases.

Results. One in four young adults (23·8%) suffered from a current mental disorder, the most prevalent being depressive (10·8%), anxiety (6·9%), substance use (6·2%) and personality disorders (6·0%). Prevalence estimates varied substantially according to the use of additional diagnostic criteria. Impairment (GAF < 61) together with DSM-IV symptom criteria produced an overall disorder prevalence of 10·3%, and 5·5% for depression. Prevalences were higher for females than males, except for alcohol abuse and personality disorders. Current co-morbidity was found in 39% of subjects with any disorder, and in more than half of those with depression. One-third of subjects with a current disorder reported an associated contact with psychiatric services and 16% had an ongoing contact.

Conclusions. Our findings support the use of additional criteria to produce clinically relevant prevalence data. Co-morbidity should receive special attention due to its amplification of both need for psychiatric care and severity of impairment. Finally, our results show disturbed young adults to be severely undertreated.

INTRODUCTION

The transition from adolescence to adulthood involves challenges in the domains of school and academic achievements, intimate relationships, and control of one's life. Depression, other psychopathology and accompanying psychosocial impairment may compromise success in these areas and have far-reaching consequences in adulthood (Harrington *et al.* 1990).

Prevalences of psychiatric disorders among late adolescent or young adult populations have been reported in only a few studies, estimates ranging from 10 to 40% (Canino *et al.* 1987; Regier *et al.* 1993; Blazer *et al.* 1994; Feehan *et al.* 1994; Newman *et al.* 1996; Wittchen *et al.* 1998). The reported point prevalence of major depression among adolescents and young adults has ranged from 2 to 9% (Goodyer, 1995). Most studies have noted widespread co-morbidity between disorders. Rates of mental disorders have been shown to increase from childhood through adolescence, and to peak in young adulthood (Newman *et al.* 1996). Only up to one-third of those with a disorder are estimated

[1] Address for correspondence: Dr Terhi Aalto-Setälä, Iirislahdenranta 30 A, FIN-02230 Espoo, Finland.

to receive psychiatric treatment (Newman *et al.* 1996).

Most recent epidemiological research has relied on operationalized diagnostic criteria to define cases. Yet, knowledge about diagnoses does not in itself provide sufficient information for public health purposes (Wittchen *et al.* 1999). To meet these requirements, an increasing body of literature also uses additional criteria, such as psychosocial impairment or need of psychiatric care. Using additional criteria may have a marked effect on prevalence estimates of disorders (Roberts *et al.* 1998) but is considered important for differentiating disorders requiring clinical attention from less severe disorders (Regier *et al.* 1998). Neither definition nor assessment of additional criteria are uniform between studies, however, and the effect of the latter on prevalence estimates may remain obscure.

Objectives

The principal aim of the present study was to estimate the prevalence and co-morbidity of current depressive and other psychiatric disorders in a non-clinical sample of 20–24-year-olds. Other aims were, with the focus on depressive disorder: (1) to examine the degree of psychosocial impairment and estimated need of psychiatric treatment in the main diagnostic categories; (2) to estimate the effect of impairment and need of psychiatric care on prevalence estimates when used in case definition; (3) to analyse the impact of co-morbidity on impairment and need of psychiatric care; and (4) to evaluate psychiatric treatment use among those with a current mental disorder. We expected disorders among young adults to be common, impairing and highly co-morbid; co-morbidity to relate to the degree of impairment and severity of need of psychiatric care; prevalence estimates to differ according to the quality of additional criteria; and psychiatric treatment use to be most prevalent among subjects with co-morbid disorders.

METHOD

Sample and procedure

The present study is part of a 5-year follow-up of high-school students first examined by questionnaire during a regular classroom hour in 1990 (Poikolainen *et al.* 2000). The subjects, mean age 16·8 years (S.D. 0·9, range 15–19), attended five urban high-schools in Helsinki (approx. 500 000 inhabitants) and five in Jyväskylä (60 000), located in southern and central Finland, respectively. Of the total of 1518 adolescents, 1493 responded (45% males, 55% females), of whom 47% ($N = 709$) (41% of males ($N = 267$), 54% of females ($N = 442$)) gave their written, informed consent to enter the follow-up study. No significant differences between the volunteering and non-volunteering respondents were found in terms of family social class, school grade-point average, age, number of recent life events, or scales measuring their self-esteem, state anxiety, or psychological defence styles, whereas somatic symptoms were slightly less reported by non-volunteering respondents (Poikolainen *et al.* 2000).

The follow-up in 1995 had a two-phase design. First, all but three of the 709 volunteers were mailed a new questionnaire; two were excluded from the follow-up due to incomplete questionnaires, and one male had died. After four reminders, the response rate was 92% ($N = 651$): 88% among males ($N = 233$) and 95% among females ($N = 418$). Based on their responses to five screening instruments (see below), subjects were divided into screening positive and negative subgroups. In the second phase, all screening positive respondents ($N = 292$) and a sample ($N = 111$) of screening negative respondents were invited by letter to participate in clinical interviews. The interviewers contacted and informed those who agreed to participate, and scheduled an appointment convenient for the subject.

Screening for interview

We invited respondents to interviews according to their score in the five different screening instruments that formed part of the 1995 questionnaire. The main screen was the General Health Questionnaire (GHQ) (Goldberg, 1972), a widely used self-administered rating scale for screening psychiatric symptomatology in individuals of the general population, validated in adult as well as adolescent samples (Winefield *et al.* 1989; Goldberg *et al.* 1997). The sensitivity of the questionnaire has been found to vary from 76 to 89%, and specificity from 80 to 87%, depending on the length of the version applied

(Bridges & Goldberg, 1989). The GHQ covers feelings of strain, depression, inability to cope, anxiety-based insomnia, lack of confidence and other psychological problems (Wall *et al.* 1998). We used the GHQ-36, which is reportedly accurate in detecting anxiety, and depression with anxiety (Katz *et al.* 1995).

For each item the respondents were asked whether they had experienced a particular symptom during the previous month. The response scale was: (1) less than usual; (2) no more than usual; (3) more than usual; and (4) much more than usual. We applied the standard GHQ scoring method (0–0–1–1), counting only the last two responses as pathological. Being positive by the GHQ implied a total GHQ score of five or more, as is the conventional threshold to indicate subjects at risk of psychiatric disorder (Huppert & Whittington, 1995). Cronbach's internal consistency coefficient alpha was 0·93 for females and 0·92 for males.

The four more minor screening instruments were as follows. Life-time self-reported referral to mental health services was charted by asking whether the respondents had ever contacted or intended to refer themselves to mental health services. All those who answered yes were regarded as screening positive (29 males and 104 females). Pathological eating behaviour was evaluated by the statement 'I purge myself after eating in order to maintain my weight', with a response scale: (1) no; (2) sometimes; (3) often; (4) almost always. Options 2–4 were considered as screening positive (27 females). A measure of alcohol use was created by calculating each respondent's estimated yearly intake of pure alcohol, based on the self-reported frequency of drinking alcohol and average alcohol consumption on each occasion. Based on results of a large cross-sectional study among Finnish first-year university students (Nyström *et al.* 1993), the threshold yearly intake of pure alcohol regarded as heavy, indicating positiveness in the screen, was 15 kg for males and 10 kg for females (14 males, 18 females). Recurrent depressive feelings were evaluated by two statements 'I am often depressed' and 'I am continuously depressed', with scoring options: (1) no; (2) somewhat; (3) moderately so; or (4) very much so. Total scores of five or more (out of eight) were regarded as screening positive (10 males, 38 females).

A positive rating in one or more of the five screens led to an invitation to clinical interview. Of the total of 651 respondents who returned the questionnaire, 31% ($N = 203$; 151 females and 52 males) were positive by GHQ scoring. The other four screens identified additional 89 subjects not positive by their GHQ score, giving altogether 292 subjects as screening positive. In all, 197 (68%) screening positive respondents (47 males, 150 females) and 48 screening negative respondents participated in the interviews, giving a total of 245 interviews (73 males, 172 females). The total mean GHQ score among interviewed screening positive subjects was 9·1 (S.D. 7·3), compared to 8·0 (S.D. 6·6) in the non-interviewed screening positives (mean difference −1·1, $P = 0{\cdot}2$, 95% CI −2·9, 0·6). Among screening negative subjects, the corresponding figures were 0·7 (S.D. 1·1) for the interviewed and 0·9 (S.D. 1·3) for the non-interviewed (mean difference 0·2, $P = 0{\cdot}4$, 95% CI −0·2, 0·7). The interviewed screening positive females reported at $P < 0{\cdot}01$ level higher and respective males at $P < 0{\cdot}05$ level lower yearly intake of alcohol than their non-interviewed screening positive counterparts. Also, interviewed screening positive females reported at $P < 0{\cdot}01$ level more often having used mental health services than the non-interviewed screening positive females. No other differences were found between those interviewed and those invited but not interviewed in either screening positive or negative subgroups as regards other screening characteristics, or in their family social class, age or sex.

Assessment of mental disorders

Diagnoses of mental disorders were based on information from semistructured clinical SCAN interview (SCAN 2.0; the Schedules for Clinical Assessment in Neuropsychiatry) (WHO, 1994). The SCAN is primarily designed for use by psychiatrists and clinical psychologists and covers ICD-10 and DSM-IV axis I diagnostic categories. Its feasibility and reliability have been tested in international field trials (WHO, 1994). The three interviewers were trained at WHO-designated SCAN training centres. To minimize recall bias, only current disorders (occurring during the 4 weeks before interview) were evaluated in the present study.

All interviews were audiotaped, with four exceptions when the subject preferred not.

Information was recorded as a list of scores on a special schedule, and a summary was written of each interview. Throughout the study, problematical issues were discussed by the two principle interviewers (T. A.-S. and A. T.-H.). To increase reliability these two interviewers rerated the 33 interviews of the third interviewer by consensus.

The best-estimate research diagnoses were generated from the diagnostic interview information. The diagnostic team, two principal interviewers (T. A.-S. and A. T.-H.) and a senior consultant (M. M.), made the diagnoses in two phases. First, based on the SCAN interview, the two principal interviewers made preliminary DSM-IV axis I research diagnoses by consensus, using DSM-IV hierarchy rules. Thereafter, all cases with a preliminary diagnosis and all unclear cases were reconsidered with the senior consultant. When necessary, the tapes were reexamined. In unclear cases additional data (clinical observations, other information form the interview, and questionnaire) were also used. By applying the use of SCAN interview by the best-estimate method, in accordance with the Longitudinal Expert All Data (LEAD) Standard (Spitzer, 1983), we aimed to maximize the validity of the research diagnoses. Diagnoses of DSM-IV personality disorders were made by consensus following the LEAD Standard; all available interview data and clinical observations were used, although strictly based on DSM-IV diagnostic criteria.

Psychosocial impairment and need of psychiatric care

The GAF scale (Global Assessment Functioning scale, DSM-IV) (APA, 1994) was completed for every subject. Current overall psychological functioning was rated on a scale of 0–100 according to DSM-IV axis V definitions. Ratings were made by consensus in the diagnostic team.

We scored the need for psychiatric care of each subject as follows: (1) indicated 'no psychopathology, no need for treatment'; (2) 'possibly mild psychopathology but no obvious need for psychiatric treatment'; (3) 'psychopathology, would benefit from treatment'; (4) 'psychopathology with severe need for psychiatric treatment; serious worsening of mental health likely without prompt treatment'. In the present paper 'need for treatment' refers to scores 3 or 4 irrespective of the severity of need of psychiatric care, while 'severe need for treatment' (score 4) only indicates those with the most severe need for treatment. The evaluations of level of need of psychiatric care were made by consensus between two members of the diagnostic team, both with clinical experience, and were based on all available interview data plus clinical impression.

Psychiatric treatment use

Data on use of mental health services were collected by questionnaire and complemented at interview when necessary. 'Contact during current episode' referred to any contact to specialty or general medical out-patient services for mental health problems during the current episode. Informal helping agencies were not included. 'Ongoing contact' meant any ongoing contact to psychiatric services at the time of interview. Use of psychotropic medication prescribed by a physician other than a psychiatrist ($N = 2$) was also considered as psychiatric treatment. None of the subjects reported current use of psychiatric in-patient services.

Data analysis

Data analyses on prevalence estimates were confined to the 647 subjects (414 females and 233 males) of the 651 subjects who returned the questionnaire, since in four cases (all females) data were incomplete. Prevalence estimates for disorders were calculated by the double sampling method (Levy & Lemeshow, 1991), giving different weights for disorders diagnosed in screening positive ($N = 197$) and screening negative ($N = 48$) interview subsamples. Therefore, prevalence estimates for disorders vary depending on the ratio of screening positive to negative subjects among those with a diagnosis.

Testing for associations between diagnosis, impairment and need of psychiatric care, as well as other comparisons of the clinical characteristics, was restricted to the interview sample ($N = 245$), using non-weighted data. Chi-square test and Fisher's exact test were used for categorical variables and the independent samples t test for continuous variables. A probability level of $\leqslant 0{\cdot}05$ was deemed to indicate statistical significance.

RESULTS

Current prevalences of DSM-IV disorders

A total of 23·8% ($N = 80$ of 245; 74 screening positives + 6 screening negatives) was diagnosed with at least one current (1-month) DSM-IV axis I or II disorder: 20·2% of males ($N = 21$ of 73; 18 positives + 3 negatives) and 26·1% of females ($N = 59$ of 172; 56 positives + 3 negatives). The respective prevalences of any axis I disorder were 22·2%, 18·1% and 24·7% (Table 1). The most prevalent disorders in females were depressive disorders (12·7%) and anxiety disorders (10·3%), while in males depression, substance abuse and personality disorders were equally prevalent (7·3–7·4%). In females, prevalences of around 5% were found for substance use disorders, eating disorders and personality disorders (Table 1).

Current depressive disorder (MDD or dysthymia) was diagnosed in 9·6% (95% CI 5·7, 13·5): 6·7% (95% CI 0·8, 12·6) among males ($N = 7$; 6 positives + 1 negative); and 11·3% (95% CI 6·0, 16·5) among females ($N = 27$; 26 positives + 1 negative), the female to male ratio being approximately 1·7:1. The somewhat higher prevalences of depressive disorders in Table 1 are due to five subjects with both MDD

Table 1. *One-month prevalences of disorders by gender*

	M ($N = 233$)	%	95% CI	F ($N = 414$)	%	96% CI	Tot ($N = 647$)	%	96% CI
Depressive disorders, total	8	7·4	(1·4, 13·4)	31	12·7	(7·3, 18·0)	39	10·8	(6·8, 14·8)
MDD	5	5·4	(−0·3, 11·0)	17	7·8	(2·9, 12·7)	22	6·9	(3·2, 10·5)
Dysthymia	3	2·0	(−0·2, 4·3)	14	4·9	(2·4, 7·4)	17	3·9	(2·1, 5·7)
Bipolar disorders	1	0·7	(−0·7, 2·0)	3	1·0	(−0·1, 2·2)	4	0·9	(0·02, 1·8)
I	0	0		1	0·4	(−0·3, 1·0)	1	0·2	(−0·2, 1·1)
II	0	0		2	0·7	(−0·3, 1·7)	2	0·5	(−0·2, 1·1)
NOS	1	0·7	(−0·7, 2·0)	0	0		1	0·2	(−0·2, 1·8)
Anxiety disorders	3	2·0	(−0·2, 4·3)	19	10·3	(4·0, 16·6)	22	6·9	(3·2, 10·5)
Generalized	1	0·7	(−0·7, 2·0)	5	3·6	(−0·8, 7·9)	6	2·3	(−0·1, 4·7)
Panic	0	0		5	1·8	(0·2, 3·3)	5	1·2	(0·2, 2·1)
Social phobia	1	0·7	(−0·7, 2·0)	4	1·4	(0·04, 2·8)	5	1·2	(0·2, 2·1)
NOS	1	0·7	(−0·7, 2·0)	4	3·2	(−1·1, 7·5)	5	2·1	(−0·3, 4·5)
PTSD	0	0		1	0·4	(−0·3, 1·0)	1	0·2	(−0·2, 1·8)
Substance use disorders	5	7·3	(−0·03, 14·6)	10	5·3	(0·7, 9·9)	15	6·2	(2·1, 10·2)
Alcohol dependence	2	1·4	(−0·5, 3·2)	4	1·4	(0·04, 2·8)	6	1·4	(0·3, 2·5)
Alcohol abuse	2	3·3	(−1·9, 8·5)	3	1·1	(−0·1, 2·2)	5	2·1	(−0·3, 4·5)
Cannabis abuse	1	2·6	(−2·4, 7·6)	3	2·9	(−1·4, 7·1)	4	2·7	(−0·4, 5·9)
Eating disorders	1	0·7	(−0·7, 2·0)	15	5·2	(2·7, 7·8)	16	3·7	(1·9, 5·4)
Anorexia nervosa	1	0·7	(−0·7, 2·0)	2	0·7	(−0·3, 1·7)	2	0·5	(−0·2, 1·1)
Bulimia nervosa	0	0		6	2·1	(0·4, 3·8)	5	1·2	(0·2, 2·1)
NOS	0	0		7	2·5	(0·7, 4·2)	7	1·6	(0·4, 2·8)
Adjustment disorders	1	0·7	(−0·7, 2·0)	2	0·7	(−0·3, 1·7)	3	0·7	(−0·09, 1·5)
With depressed mood	1	0·7	(−0·7, 2·0)	2	0·7	(−0·3, 1·7)	3	0·7	(−0·09, 1·5)
Other	0	0		0	0		0	0	
Other axis I disorders	2	1·4	(−0·5, 3·2)	1	0·4	(−0·3, 1·0	3	0·7	(−0·09, 1·5)
Schizophrenia	0	0		1	0·4	(−0·3, 1·0)	1	0·2	(−0·2, 1·8)
Conversion disorder	1	0·7	(−0·7, 2·0)	0	0		1	0·2	(−0·2, 1·8)
Identity disorder	1	0·7	(−0·7, 2·0)	0	0		1	0·2	(−0·2, 1·8)
Personality disorders	8	7·4	(1·4, 13·4)	14	4·9	(2·4, 7·4)	22	6·0	(3·0, 8·9)
Cluster A	3	4·0	(−1·4, 9·3)	1	0·4	(−0·3, 1·0)	4	1·8	(−0·5, 4·2)
Cluster B	5	3·4	(0·5, 6·3)	11	3·8	(1·6, 6·1)	16	3·7	(1·9, 5·4)
Cluster C	0	0		2	0·7	(−0·3, 1·7)	2	0·5	(−0·2, 1·1)
Disorders, total									
Axis I or II disorders	29	27·6	(16·9, 38·3)	95	40·5	(31·5, 49·4)	124	35·7	(29·0, 42·5)
Axis I disorders	22	20·2	(10·6, 29·7)	81	35·6	(26·7, 44·4)	102	29·8	(23·3, 36·2)
Subjects total									
Any axis I or II disorders	21	20·2	(10·6, 29·7)	59	26·1	(18·0, 34·1)	80	23·8	(17·8, 29·9)
Any axis I disorder	18	18·1	(8·7, 27·5)	55	24·7	(16·7, 32·6)	73	22·2	(16·2, 28·2)

M, Male; F, Female; Tot, total.

Table 2. *Effect of additional criteria on prevalence estimates*

	Prevalence based on DSM-IV symptom criteria % (S.E.)	Prevalence based on DSM-IV and			
		GAF < 71 % (S.E.)	GAF < 61 % (S.E.)	Treatment need % (S.E.)	Severe treatment need % (S.E.)
N interviewed = 245					
Depressive disorders	9·6 (2)	9·6 (2)	5·5 (1)	8·2 (2)	3·0 (1)
MDD	6·9 (2)	6·9 (2)	3·7 (1)	5·5 (1)	2·3 (0·7)
Dysthymia	3·9 (0·9)	3·9 (0·9)	3·0 (0·8)	3·9 (0·9)	1·8 (0·6)
Bipolar disorders	0·9 (0·4)	0·7 (0·4)	0·5 (0·3)	0·7 (0·4)	0·2 (0·2)
Anxiety disorders	6·9 (2)	5·7 (1)	3·4 (1)	5·3 (1)	2·3 (1)
Substance use disorders	6·0 (2)	6·0 (2)	3·0 (1)	4·6 (2)	1·4 (0·6)
Eating disorders	3·7 (1)	3·2 (1)	1·8 (1)	3·2 (1)	1·6 (0·6)
Adjustment disorders	0·7 (0·4)	0·7 (0·4)	0·5 (0·3)	0·5 (0·3)	0
Personality disorders	6·0 (1)	5·7 (1)	4·4 (1)	3·2 (1)	2·3 (1)
Any psychiatric disorders	24·0 (3)	22·4 (3)	10·3 (2)	17·9 (3)	5·0 (1)

and dysthymia, since the Table shows prevalence estimates for separate disorders, including subjects with several disorders.

Effect of additional criteria in case definition

We used several approaches in case definition to estimate the effect of additional criteria on prevalence rates. Table 2 shows the prevalence estimates for the major diagnostic categories, and separately for depressive disorders, according to whether case definition was based solely on DSM-IV symptom criteria or whether additional criteria were also applied.

Co-morbidity

Due to low number of males in some disorder categories, specific co-morbidity rates (for current DSM-IV axis I or II co-morbidity) are shown entirely for the most prevalent disorders, by gender (Table 3). For the same reason, results concerning gender differences in co-morbidity need to be interpreted with caution. Of subjects with any psychiatric disorder, 35% ($N = 28$ of 80) were diagnosed to have at least two current disorders, and 11% (9/80) three or more. No gender difference was found in the proportion of co-morbid disorders (33% in males and 36% in females) (Table 3).

All co-morbid cases, independent of diagnosis, showed at least mild impairment (GAF < 71) in functioning (Table 3). The mean GAF score for subjects with a co-morbid disorder was 53·1 (S.D. 6·9) and for those with only one disorder 65·0 (S.D. 7·3) (mean difference −11·9, 95% CI −15·2, −8·7, $P < 0{\cdot}0001$). Severe need of psychiatric care was determined in 61% of co-morbid disorders ($N = 17$ out of 28) *versus* 10% of single disorders (5 out of 52) ($P < 0{\cdot}0001$, Fisher's exact test).

Psychosocial impairment

The mean GAF score for subjects ($N = 80$) with any current disorder was 60·4 (S.D. 9·2). The lowest mean GAF scores (mean GAF score with standard deviation in parentheses) were found for depressive disorders (57·3 (7·8)), anxiety disorders (57·8 (9·6)), substance use disorders (57·4 (8·4)), and personality disorders (56·6 (9·9)). Of subjects with any disorder 91% showed at least mild impairment (GAF < 71), and more than half at least moderate impairment (GAF < 61) (Table 3). The mean GAF for subjects with no current DSM-IV disorder was 79·3 (S.D. 7·5): 82·5 (S.D. 6·9) in males ($N = 52$) and 77·8 (S.D. 7·4) among females ($N = 113$), 13% ($N = 22$ of 165) showing mild impairment (GAF 61–70).

Need and use of psychiatric treatment

A need for treatment was assessed in almost four-fifths and severe need of psychiatric care in over one-quarter of subjects with any DSM-IV diagnosis. Severe need of psychiatric care was found in nearly half of those with MDD, dysthymia, anxiety disorder, eating disorder or personality disorder (Table 3).

One-third of subjects with any DSM-IV axis I or II disorder had contacted mental health services at some phase during the current episode, and ongoing treatment contact was reported by 16% (Table 4).

Compared to subjects with a disorder but no contact with mental health services during the

Table 3. *Co-morbidity, impairment and treatment need in disorders*

N interviewed = 245	Subjects *N*	With impairment GAF < 71 % (*N*)	With impairment GAF < 61 % (*N*)	With estimated need for treatment % (*N*)	With severe need for treatment % (*N*)
Any depressive disorder*					
Males	7				
Non-co-morbid	5	100 (5)	60 (5)	80 (4)	20 (1)
Co-morbid**	2	100 (2)	100 (2)	100 (2)	100 (2)
Females	27				
Non-co-morbid	12	100 (12)	42 (5)	92 (11)	17 (2)
Co-morbid	15	100 (15)	93 (14)	100 (15)	53 (8)
MDD					
Males	5				
Non-co-morbid	3	100 (3)	67 (2)	67 (2)	33 (1)
Co-morbid	2	100 (2)	100 (2)	100 (2)	100 (2)
Females	17				
Non-co-morbid	8	100 (8)	50 (4)	88 (7)	25 (2)
Co-morbid	9	100 (9)	89 (8)	100 (9)	56 (5)
Anxiety disorders					
Males	3				
Non-co-morbid	0	0	0	0	0
Co-morbid	3	100 (3)	100 (3)	100 (3)	67 (2)
Females	18				
Non-co-morbid	8	100 (8)	25 (2)	75 (6)	13 (1)
Co-morbid	10	100 (10)	100 (10)	100 (10)	70 (7)
Personality disorders					
Males	8				
Non-co-morbid	3	67 (2)	0	0	0
Co-morbid	5	100 (5)	80 (4)	60 (3)	40 (2)
Females	14				
Non-co-morbid	4	100 (4)	25 (1)	25 (1)	0
Co-morbid	10	100 (10)	100 (10)	100 (10)	80 (8)
Any psychiatric disorder					
Males	21				
Non-co-morbid	14	79 (11)	29 (4)	57 (8)	7 (1)
Co-morbid	7	100 (7)	86 (6)	71 (5)	57 (4)
Females	59				
Non-co-morbid	38	92 (35)	29 (11)	71 (27)	11 (4)
Co-morbid	21	100 (21)	95 (20)	100 (21)	62 (13)

*N of subjects with MDD of dysthymia, or both.
**DSM-IV Axis I or II current non-affective co-morbidity.

current episode, those with contact were discovered more often to exhibit a co-morbid disorder ($N = 16$ of 26 *v.* $N = 15$ of 54, $\chi^2 = 8{\cdot}4$, df 1, $P = 0{\cdot}004$) and had a lower mean GAF score (mean GAF 57·0 *v.* 62·0, mean difference −5·0 (S.D. 2·1), 95% CI −9·3, −0·8, $P = 0{\cdot}02$).

Current depressive disorders: clinical correlates

All subjects with a depressive disorder were at least mildly (GAF < 71) and more than two-thirds severely impaired (GAF < 61) (Table 3). Of subjects with current MDD or dysthymia, 59% had another current disorder. The most common concurrent disorders were anxiety disorders ($N = 8$), followed by substance use disorders ($N = 6$), eating disorders ($N = 5$) and personality disorders ($N = 4$). Double depression was discovered in five subjects (15% of all depressive disorders). One-third ($N = 7$ of 20) of co-morbid depressive disorder sufferers had more than one co-morbid disorder.

Co-morbidity was related significantly to the degree of impairment: the mean GAF score for a co-morbid depressive disorder was 53·0 (S.D. 6·1), compared to 63·4 (S.D. 5·5) for a non-co-morbid disorder (mean difference −10·5, 95% CI −14·6, −6·3, $P < 0{\cdot}001$). Marked impairment (GAF < 61) was found in 95% of subjects with a co-morbid and in 36% of those with a non-co-morbid depressive disorder ($P < 0{\cdot}001$, Fisher's exact test). All subjects with a co-morbid depressive disorder were estimated to be in need of psychiatric treatment, and severe need of psychiatric care was assessed in 65%. Eighty-

Table 4. *Use of psychiatric services in major disorder categories*

	Depr. (MDD, DD)		Anxiety disorders		Substance use		Eating disorders		Any axis I or II	
	N	%	*N*	%	N	%	N	%	N	%
Total meeting DSM-IV criteria	34		21		14		16		80	
Contact	17	50	10	48	3	21	8	50	26	33
Ongoing	6	18	5	24	3	21	4	25	13	16
With severe impairment (GAF < 61)	24		15		9		8		41	
Contact	12	50	7	47	3	33	5	63	16	39
Ongoing	4	17	3	20	3	33	2	25	8	20
With treatment need (total)	32		19		12		14		62	
Contact	17	53	9	47	3	25	8	57	25	40
Ongoing	6	19	4	21	3	25	4	29	12	19
With severe treatment need	13		10		6		7		22	
Contact	9	69	5	50	3	50	4	57	13	59
Ongoing	4	31	3	30	3	50	2	29	8	36

Contact, i.e. contact during current episode.
Ongoing, i.e. ongoing treatment contact.

six per cent of non-co-morbid depressive disorders were estimated to need treatment (Table 3). Contact with mental health services during the current episode of depression was reported by one half, and ongoing treatment contact by less than one-fifth of subjects with a depressive disorder (Table 4).

DISCUSSION

Main findings

One in ten young adults aged 20 to 24 years was diagnosed as suffering from a current DSM-IV disorder with associated impairment. Mental disorders were often co-morbid and impairing, and generally more prevalent among females. Depression was the most common disorder in both sexes. The use of additional diagnostic criteria notably influenced the prevalence estimates for disorders. One-third of young adults with any DSM-IV disorder had contacted mental health services during the current episode.

Strengths and limitations

This study provides clinically relevant prevalence data not only by reporting prevalence estimates for current DSM-IV disorders but also by evaluating related co-morbidity and degree of impairment, and by giving data on psychiatric treatment use, in an urban sample of well-educated young Finnish adults. To our knowledge, prevalence data specifically on young adults, and relying on standardized psychiatric interviews and operationalized diagnostic criteria according to the DSM-classification, have previously emerged from very few studies (Newman *et al.* 1996; Kessler & Walters, 1998), while diagnoses according to DSM-IV criteria have been reported only by Wittchen and colleagues (1998) in a mixed adolescent-adult sample.

Being well-validated any widely used, as well as sufficiently sensitive and specific, the General Health Questionnaire was chosen as the main screening instrument for diagnostic interviews (Goldberg, 1997). Another methodological strength was the use of a double sampling design to calculate corrected prevalence figures. Furthermore, in our careful case ascertainment procedure all cases, including all subclinical cases, were discussed at least twice allowing clinical judgement to specify the research diagnoses, although DSM-IV criteria were strictly adhered to. We assume thereby to have been able to minimize overdiagnosing milder forms of psychiatric disorders common in community-based epidemiological studies (Regier *et al.* 1998), and believe this procedure improved the validity of the results. One-month prevalences were reported in order to minimize recall bias in assessing prevalences of disorders.

The main limitation of our study concerns the problems in sample representativeness. Of the original adolescent sample, only 47% volunteered for the follow-up, and although the

response rate in the follow-up screening was as good as 92%, the attrition at the clinical interview stage was again substantial. Although analyses of the available data revealed no major differences between the respondents and the non-respondents along the three-phase sampling, it is possible that factors associating with the risk of psychopathology have indeed affected response readiness, non-respondents possibly having increased prevalences of psychiatric symptoms (Blazer *et al.* 1994). Due to the high-school background of our subjects, the rates of e.g. depression may be underestimates since high-school dropouts and non-attenders are omitted. Hankin and his colleagues (1998) have recently, however, reported depression rates and accompanying gender differences to be similar in university compared to non-university samples, supporting the generalizability of results from a non-representative sample, such as ours, in depression research. Other limitations are our sample comprising subjects entirely from urban and suburban environments, and the low number of males in the interview sample. These limitations deserve particular attention as our prevalence estimates were calculated in a follow-up sample.

Case definition concerning DSM-IV axis II personality disorders is another methodological restriction. However, prior studies have been inconsistent as to the validity of existant measures of these disorders (Zimmerman, 1994), and the use of the LEAD Standard (Spitzer, 1983) method, in which expert clinical judgement plays a central role has been recommended (Pilkonis *et al.* 1991; Grilo *et al.* 1998). Our results concerning personality disorders are validated by their concordance with previous research (Samuels *et al.* 1994).

Prevalence of disorders

Studies have reported 12-month estimates for any disorder of 36% among late adolescents (Feehan *et al.* 1994) and 40% among young adults (Newman *et al.* 1996). In mixed late adolescent-young adult samples, prevalences of 10% (Canino *et al.* 1987) and 17% (Regier *et al.* 1993) have been found. Mixed mid-adolescent-young adult samples have produced 12-month rates of 37% (Kessler *et al.* 1994) and 17·5% (Wittchen *et al.* 1998). Prevalence estimates from mixed adolescent-young adult samples are not, however, fully comparable with those of pure late adolescent or young adult samples, since developmental changes during adolescence may affect the expression of a disorder. Our study may clarify this area by providing prevalence data specifically for young adults.

We found every fourth subject (24%) to suffer from at least one DSM-IV psychiatric disorder, more than one-third of these having two or more disorders. In accord with with previous studies (Regier *et al.* 1993; Feehan *et al.* 1994; Kessler *et al.* 1994; Newman *et al.* 1996; Wittchen *et al.* 1998), depression and anxiety disorders were more prevalent among females, while substance use and personality disorders were more prevalent among males. As before, with the exception of the study by Wittchen and colleagues (1998), the overall prevalence of having a psychiatric disorder was higher in females. As for major depression, the NCS reported it being more prevalent among 21–22-year olds (7·7%) than in either somewhat younger (4·7%) or older (2·9%) age groups (Kessler & Walters, 1998). Newman and colleagues (1996) reported a 1-year prevalence of 16·8% for major depressive episode and 3·0% for dysthymia among 21-year olds. Our prevalences of 6·9% for MDD (5·4% in males and 7·8% in females) and 3·9% for dysthymia are at the high end of the range previously reported, being in line with previous findings showing disorder rates to be highest in early adulthood (Newman *et al.* 1996).

Due to the small number of interviewed males in our study, the low prevalence estimates for anxiety disorders among males need to be interpreted with caution. Also, anxiety disorders might have been less common than average among those who volunteered for interviews. Earlier, prevalences of anxiety disorders have ranged from a current estimate of 3·2% in mid-adolescents (Lewinsohn *et al.* 1993) to a 1-year estimate of 9·3% among 15–24-year-olds (Wittchen *et al.* 1998). As for substance use disorders, our current prevalence of 6·2% is comparable with 1-year prevalences of 11·4% in 15–24-year-olds (Wittchen *et al.* 1998), 10·4% among 18-year-olds (Feehan *et al.* 1994) and 9·8% in 21-year-olds (Newman *et al.* 1996). Finally, the relatively high rates of eating disorders in the present sample may partly be due to its urban setting.

Co-morbidity

Population studies have reported nearly half of young people with psychiatric diagnoses to have more than one concurrent disorder (Regier *et al.* 1993; Kessler *et al.* 1994; Newman *et al.* 1996), of whom one-fifth up to one-half are estimated to have more than one co-occurring disorder (Birmaher *et al.* 1996). Accordingly, our study produced a current overall co-morbidity rate of 35% across major disorder categories. Also congruent with previous studies (Kessler *et al.* 1994; Newman *et al.* 1996; Wittchen *et al.* 1998) we found subjects with a co-morbid disorder to exhibit the poorest psychosocial functioning.

Psychiatric treatment use

Previously, 25% of 21-year-olds (Newman *et al.* 1996) and 17% of a mixed adolescent-adult sample in the NCS (Kessler *et al.* 1999) reported some kind of out-patient contact for psychiatric problems, both studies providing 12-month service use rates for 12-month DSM-III-R disorders. Of young adults with any DSM-IV disorder with or without impairment (GAF $<$ 61) in the present study, one in five had an ongoing treatment contact at time of interview, and treatment contact at any phase of the current disorder was reported by one-third. Congruent with previous findings (Newman *et al.* 1996; Kessler *et al.* 1999), subjects with a depressive disorder were more likely to have sought treatment than their peers with any other disorder.

Clinical significance of disorders

It is well recognized that meeting the diagnostic symptom criteria of a disorder is not equivalent to needing clinical attention. In the present study, one in four young adults suffered from a current mental disorder, raising the question of how many disorders were clinically significant. Studies on non-clinical samples may over-diagnose milder disorders such as depression by diagnosing milder forms of the same disorders seen in clinical settings, or syndromes illustrating the boundary between mental disorder and psychological health (Regier *et al.* 1998; Spitzer, 1998). To differentiate clinically significant disorders from less severe ones thus requires use of additional criteria, although the concept of clinical significance is difficult to operationalize and definitions of additional criteria vary across studies. For example, studies by Newman (1996), Wittchen (1998) and Kessler (1999) and their colleagues differ from the present study and from each other in their definition of impairment. This issue is of importance not only when it hampers comparison of results across studies but also in the sense of providing reliable and clinically valid prevalence data for service planning and preventions purposes. We found that the GAF score following the definitions of DSM-IV well differentiated subjects according to their level of psychosocial functioning. The requirement of DSM-IV symptom criteria together with impairment defined by GAF scores $<$ 61 may produce clinically relevant prevalence estimates for disorders among young people.

Clinical implications

Despite discrepancies across studies in defining and assessing additional criteria, as well as clinical significance, our findings support the use of additional criteria in assessing mental disorders. Measurement of psychosocial functioning turned out to be an easy way to differentiate clinically significant disorders from less severe ones. Also, our results emphasize the clinical implications of co-morbidity. As co-morbidity is distinguished by its associations with greater impairment and more severe need of psychiatric care, it should be seriously considered when assessing mental disorders. Proper assessment of co-morbidity may offer a way to identify young adults in most urgent need of treatment. Finally, the finding that only one-fifth of young adults with a current, clinically significant disorder were receiving psychiatric treatment calls for more effort to offer treatment to those with the most severe need and greatest impairment.

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Psychiatric treatment seeking and psychosocial impairment among young adults with depression

Terhi Aalto-Setälä[a,*], Mauri Marttunen[a,b], Annamari Tuulio-Henriksson[a], Kari Poikolainen[a,c], Jouko Lönnqvist[a]

[a]*Department of Mental Health and Alcohol Research, National Public Health Institute, Mannerheimintie 166, FIN-00300 Helsinki, Finland*

[b]*Department of Adolescent Psychiatry, Helsinki-Uusimaa Hospital District, Peijas Hospital, Vantaa, Finland*

[c]*Finnish Foundation for Alcohol Studies, Helsinki, Finland*

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Abstract

Background: We report data on 1-year prevalence and comorbidity of depression, related impairment, treatment need, and psychiatric treatment among young adults. *Methods:* A sample of young urban adults ($n = 245$) mean age 21.8 years was screened from a baseline population of 706 high-school students and given a semistructured clinical interview to evaluate 12-month prevalence of depression, psychosocial functioning according to DSM-IV GAF scale, need for psychiatric treatment, and use of mental health services. *Results:* One in 10 young adults suffered from depression with associated psychosocial impairment, the female-to-male-ratio being approximately 2:1. Most depressive disorders were comorbid with other DSM-IV disorders, depression usually occurring secondary to other disorders. Comorbidity was related to impairment, treatment need, and treatment contacts. Less than half of the depressed young adults had ever contacted mental health services, and less than one-third reported treatment contacts during the index episode. Males were less likely than females to report previous treatment contacts or intention to refer to mental health services for their problems, but treatment contacts during the index episode were reported equally often by both sexes. *Conclusions:* A minority of the severely depressed young adults with associated impairment had sought treatment. Except for subjects with dysthymia, no gender difference emerged in treatment contact rates during the 12-month depression episode. Comorbidity showed important clinical implications by its relation to severity of depression and treatment contacts. © 2002 Elsevier Science B.V. All rights reserved.

Keywords: Depression; Comorbidity; Impairment; Psychiatric treatment; Young adults

1. Introduction

Data from epidemiological studies suggest the prevalence of adolescent depression to be increasing

*Corresponding author. Iirislahdenranta 30, FIN-02230 Espoo, Finland. Fax: +358-9-8870-1493.

E-mail address: terhi.alto-setala@ktl.fi (T. Aalto-Setälä).

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(Kessler and Walters, 1998; McGee et al., 1992). Although rates of recovery are high, depression tends to recur and continue into adulthood (Harrington et al., 1990; Kovacs, 1996; Lewinsohn et al., 1999). Depression in adolescence is known to associate with impairment in psychosocial functioning (Puigh-Antich et al., 1993; Wittchen et al., 1998) and adolescent suicide (Marttunen et al., 1991; Rao et al., 1993). Although the prevalences of depression and other mental disorders seem to peak in late adolescence and early adulthood (Kessler and Walters, 1998; Newman et al., 1996), few studies have provided prevalence or service use data during the transition from adolescence to adulthood (Canino et al., 1987; Kessler and Walters, 1998; Newman et al., 1996; Robins and Regier, 1991; Wittchen et al., 1998). They have found the prevalence of 12-month depression to vary between 5.3 and 16.7%, and usually a clear female preponderance. In a majority of subjects depression is reportedly comorbid with other mental disorders, and comorbidity is related to more severe psychosocial impairment and more frequent treatment contacts. Previous studies have indicated depressed late adolescents and young adults to be seriously undertreated, only approximately one-third reporting treatment contacts (Kessler et al., 1999; Newman et al., 1996; Wittchen et al., 1998).

To our knowledge this is the first study on a pure young adult population to provide data on the epidemiology of 12-month depression, based on semistructured diagnostic interviews. We focused on the the role of gender, comorbidity and impairment in the treatment seeking of depressed young adults. We expected treatment seeking to be more frequent among females than males, and severity of disorder to relate to the probability of treatment use.

2. Methods

2.1. Sample and procedure

As part of a 5-year follow-up of high-school students in Finland (Poikolainen et al., 1995) we examined 706 20–24-year-olds in a two-phase study using a self-administered questionnaire and clinical interviews.

The baseline sample in 1990 comprised urban and suburban adolescents, sharing similar ethnic and social backgrounds. Five schools in Helsinki (500 000 inhabitants) and five in Jyväskylä (60 000 inhabitants) were chosen to represent a crossection of urban environments and school entrance requirement levels. Of the original 1518 students, 1493 responded, of whom 47% ($n = 709$) identified themselves and gave their written informed consent to enter the follow-up study. The mean age of subjects was 16.8 years (S.D. 0.9, range 15–19). No significant differences between the volunteering and non-volunteering respondents were found in terms of family social class or school grade-point average.

In 1995, 706 of the 709 participants were mailed a new questionnaire. Two were excluded from the follow-up due to incomplete baseline questionnaires, and one male had died. The response rate (after four reminders) was 92% ($n = 651$).

The questionnaire contained five different screens, based on which the respondents were divided into screening positive and negative subgroups. All screening positive ($n = 292$) and a sample of screening negative respondents ($n = 111$) were invited by letter to participate in a clinical interview. The letter described the follow-up study and included a prepaid envelope for returning the consent form. The interviewers contacted those willing to participate and scheduled appointment.

A total of 245 interviews were made of 197 screening positive and 48 screening negative subjects; there were 73 males and 172 females. No group differences were found between the interviewed and those invited but not interviewed in family social class, age, gender or total mean scores in the General Health Questionnaire (GHQ, see below) (15). The mean total GHQ score among the interviewed screening positive subjects was 9.1 (S.D. 7.3), compared to 8.0 (S.D. 6.6) of the non-interviewed screening positives (mean difference -1.1, $P = 0.2$, 95% CI (-2.9, 0.6)). Nor did we find differences among screening negative subjects, the corresponding figures being 0.7 (S.D. 1.1) for the interviewed and 0.9 (S.D. 1.3) for the non-interviewed (mean difference 0.2, $P = 0.4$, 95% CI (-0.2, 0.7)); also age and sex distribution were similar in the screening negative interviewed and non-interviewed groups (22 of the invited 52 females and 26 of the 59 males were interviewed; $\chi^2 = 0.00$,

df = 1, $P = 1.0$; mean age was 22.0 (S.D. 1.1) among the interviewed versus 21.0 (S.D. 4.1) among females; $P = 0.3$, two-tailed *t*-test; and mean age 21.8 (S.D. 0.9) vs. 21.9 (S.D. 0.9) among males; $P = 0.3$, two-tailed *t*-test).

2.2. Screens for interview

The main screen for interviews was the General Health Questionnaire (GHQ) (Goldberg, 1972), a widely used self-administered rating scale for screening psychiatric symptomatology in individuals of the general population. It has been validated in adult as well as adolescent samples (Goldberg et al., 1997; Winefield et al., 1989). Depending on the version of the GHQ applied, its sensitivity has varied from 76 to 89%, and specificity from 80 to 87% (Bridges and Goldberg, 1989). The GHQ covers feelings of strain, depression, inability to cope, anxiety-based insomnia, lack of confidence, and other psychological problems (Wall et al., 1998). We used the GHQ-36, which is accurate for detecting anxiety and depression with anxiety (Katz et al., 1995).

For each of the 36 items respondents were asked to report whether they had experienced a particular symptom during the previous month (1) less than usual, (2) no more than usual, (3) more than usual, or (4) much more than usual. The standard GHQ scoring method (0-0-1-1) counting only the last two responses as pathological was applied and subjects scoring five or more were considered screening positives (Huppert and Whittington, 1995). Cronbach's internal consistency coefficient α was 0.93 for females and 0.92 for males. One-third ($n = 203$) of the 651 questionnaire respondents were positive by GHQ scoring (151 females and 52 males).

The other four screens were the following: *Self-reported referral to mental health services* asked whether the respondents had ever contacted or intended to refer themselves to mental health services. Those who answered yes were regarded as screening positives (29 males and 104 females). *Pathological eating behavior* was evaluated by the statement ''I purge myself after eating in order to maintain my weight'', with a response scale of (1) no, (2) sometimes, (3) often, (4) almost always. Respondents choosing options 2–4 were considered screening positives (27 females). A measure of *alcohol use* was created by calculating each respondent's estimated yearly intake of pure alcohol from the self-reported frequency of drinking alcohol and average alcohol consumption on each occasion. Based on the results of a large cross-sectional study among Finnish first-year university students (Nyström et al., 1993), the threshold yearly intake of pure alcohol regarded as heavy was 15 kg for males and 10 kg for females, identifying 14 males and 18 females as screening positives. *Recurrent depressive feelings* were evaluated by two statements: ''I am often depressed'', and ''I am continuously depressed'', with scoring options (1) no, (2) somewhat, (3) moderately so, or (4) very much so. Total scores of five or more out of eight were regarded as screening positive; 10 males and 38 females were thereby classified.

2.3. Assessment of mental disorders

Diagnoses of mental disorders were based on information from semistructured clinical SCAN-interviews (SCAN 2.0; the Schedules for Clinical Assessment in Neuropsychiatry) (WHO, 1994). The SCAN aims to assess, measure and classify psychopathology and behavior associated with the major psychiatric syndromes of adult life. The SCAN incorporates the 10th edition of the Present State Examination, and retains many of its features, such as rating scales with defined thresholds, and a glossary of definitions. The reliability of the SCAN is good (Eaton et al., 2000). The aim of the interviewer is to discover which phenomena and which disorders have been present during a designated period of time and with what degree of severity. The onset and course of each disorder or symptom are discussed with the interviewee.

The SCAN is primarily designed for use by psychiatrists and clinical psychologists and covers ICD-10 (WHO, 1992) and DSM-IV (APA, 1994) axis 1 diagnostic categories. The three interviewers were trained at WHO-designated SCAN training centres. Disorders occurring during the 12 months before interview were evaluated in the present study.

All interviews were audiotaped, with four exceptions. Information was recorded as a list of scores on a special schedule, and a summary was written of each interview for further analyses and to aid recall.

The mean duration of the interview was 90 min (range 40–210 min). To increase reliability, the two principal interviewers rerated the 33 interviews of the third interviewer by consensus.

We made consensus-based diagnoses from the semistructured interview information. The diagnostic team, consisting of two principal interviewers (TAS and ATH) and a senior consultant (MM), made the diagnoses in two phases. Based on the SCAN-interview, the two principal interviewers made preliminary DSM-IV axis 1 research diagnoses by consensus, using DSM-IV hierarchy rules. All cases with a preliminary diagnosis and all unclear cases were reconsidered with the senior consultant.The temporal order of disorders was paid particular attention at these meetings. When necessary, the tapes were reexamined. In unclear cases additional data (clinical observations, other information from the interview and questionnaire) were also used. Applying the SCAN diagnostic criteria by the best-estimate method, in accordance with the Longitudinal Expert All Data Standard (Spitzer, 1983), helped to maximize the validity of the research diagnoses. Diagnoses of DSM-IV personality disorders were made by consensus following the LEAD Standard; all available interview data and clinical observations were used, although strictly based on DSM-IV diagnostic criteria.

2.4. Psychosocial impairment and psychiatric treatment need

The Global Assessment Functioning scale (GAF, DSM-IV) (APA, 1994) was completed and need of psychiatric care evaluated by consensus in the diagnostic team. The rating of overall psychological functioning during the worst phase of the 12-month episode was rated on a scale of 0–100 according to DSM-IV axis V definitions. ‘‘In need for treatment’’ refers to subjects considered in need of psychiatric consultation.

2.5. Use of psychiatric services and intention to seek treatment

Data on use of mental health services were collected by questionnaire and complemented at interview when necessary. Treatment contacts included any contact with specialty or general medical outpatient services which occurred for mental health problems. Informal helping agencies were not included. Use of psychotropic medication prescribed by a physician other than a psychiatrist ($n = 1$) was also considered as psychiatric treatment. This study reports rates for any contacts (over lifetime) and those occurring at any phase of the 12-month episode.

We evaluated the degree of intention to refer to mental health services among those diagnosed as having 12-month depression but no previous treatment contacts, hypothesizing that intention to referral would somewhat reflect the level of perceived distress due to depression. Treatment intention was evaluated by self-reported questionnaire information; we asked whether the subject had ever used mental health services for his/her problems. Response options for no prior contacts were ‘‘no’’ and ‘‘no, but I have considered it’’. The former group was considered as subjects with negative treatment intention, and the latter as subjects with no contacts but intention to use services.

2.6. Data analysis

Data analyses on prevalence estimates were confined to the 647 subjects (418 females and 233 males) of the 651 who returned the questionnaire, since in four (all female) cases data were incomplete. Prevalence estimates for disorders were calculated by the double sampling method (Levy and Lemeshow, 1991), giving different weights for disorders diagnosed in screening positive ($n = 197$) and screening negative ($n = 48$) interview subsamples. Testing for associations between diagnosis, impairment and treatment need was restricted to those diagnosed with any type of depression ($n = 67$). The χ^2-test and Fisher’s exact test were used for categorical variables and independent samples t-test for continuous variables. A probability level ≤ 0.05 or less indicated statistical significance.

3. Results

3.1. Prevalence of 12-month depression

Prevalences of DSM-IV depressive disorders (MDD, dysthymia, depressive disorder NOS) and

Table 1
Twelve-month depression: prevalences by gender and impairment (GAF < 61)

	With impairment (GAF < 61)				With impairment (GAF < 61)				With impairment (GAF < 61)			
	M (*n*)[a]	Prev% (95%CI)	M (*n*)[a]	Prev% (95%CI)	F (*n*)[a]	Prev% (95%CI)	F (*n*)[a]	Prev% (95% CI)	Tot (*n*)[a]	Prev% (95%CI)	Tot (*n*)[a]	Prev% (95%CI)
Depressive disorders (total)	11	9.5 (3.1,15.8)	9	6.2 (2.4,10.0)	53	22.2 (15.1,29.2)	42	14.7 (10.7,18.7)	64	17.4 (12.6,22.3)	51	11.7 (8.8,14.6)
MDD	8	7.4 (1.4,13.4)	7	4.8 (1.4,8.2)	33	15.2 (8.5,21.8)	25	8.7 (5.5,12.0)	41	12.3 (7.6,16.7)	32	7.3 (4.9,9.7)
Dysthymia	3	2.0 (−0.2,4.3)	2	1.4 (−0.5,3.2)	14	4.9 (2.4,7.4)	13	4.5 (2.2,6.9)	17	3.9 (2.1,5.7)	15	3.4 (1.7,5.1)
Depressive disorder NOS	0	0	0	0	6	2.1 (0.4,3.8)	4	1.4 (0.04,2.8)	6	1.4 (0.3,2.5)	4	0.9 (0.02,1.8)
Adjustment disorders with depressed mood	4	2.7 (0.1,5.4)	2	1.4 (−0.5,3.2)	10	3.5 (1.4,5.6)	3	1.1 (−0.1,2.2)	14	3.2 (1.6,4.9)	5	1.2 (0.2,2.1)
Subjects with any:												
depressive disorder	10	8.8 (2.5,15.0)	8	5.5 (1.9,9.1)	42	18.3 (11.4,25.2)	32	11.2 (7.6,14.8)	53	14.9(10.2,19.6)	40	9.2 (6.5,11.8)
depressive syndrome	14	12.2 (5.5,18.9)	10	6.9 (2.9,10.8)	52	21.8 (14.8,28.9)	35	12.2 (8.5,16.0)	67	18.1 (13.2,23.0)	45	10.3 (7.5,13.1)

[a] Prevalence estimates for disorders vary depending on the ratio of screening positive to negative subjects among those with a diagnosis.

adjustment disorders with depressed mood are presented in Table 1. When based only on DSM-IV symptom criteria, 15% of subjects were diagnosed with a 12-month depressive disorder, and 18% with either depressive disorder or adjustment disorder with depressed mood, together constituting the depressive syndrome. Prevalences dropped by more than one-third when psychosocial impairment (GAF score < 61) was required for caseness (Table 1).

MDD and dysthymia were two (MDD with or without impairment, DD without impairment) to more than three (DD with impairment) times more common among females. Depressive disorder NOS was diagnosed entirely in females. Adjustment disorders were similarly prevalent in both sexes (Table 1).

3.1.1. Comorbidity

Approximately two-thirds of subjects with MDD, three-fourths with dysthymia and half with depressive disorder NOS were diagnosed with at least one other 12-month DSM-IV disorder (Table 2). These rates include 11 subjects with both MDD and dysthymia. All but one adjustment disorders were non-comorbid, the exception being comorbid with a personality disorder. Of all comorbid disorders, one-third (12/33) were comorbid with more than one disorder.

The disorders comorbid with MDD were dysthymia in almost one-third ($n = 11$), anxiety disorders ($n = 10$), eating disorders ($n = 7$), substance use disorders ($n = 5$), personality disorders ($n = 5$), and identity disorder ($n = 1$). Comorbid disorders in dysthymia were MDD in almost two-thirds ($n = 11$ of 17), anxiety disorders in five, eating disorders in three, substance use disorders in two subjects, and personality disorder in one. Two subjects with depressive disorder NOS had a comorbid eating disorder and one a personality disorder.

Adequate data on temporal priorities of disorders were obtained in 22 of 25 subjects with a 12-month depression comorbid with any other axis 1 non-affective disorder.

The majority of subjects (86%) (19/22) reported at least one other axis 1 disorder preceding depressive episodes. Anxiety disorders preceded depression in 78% (7/9), eating disorders in 89% (8/9), and substance use disorders in 80% (4/5) of subjects with depression comorbid with these disorders.

3.1.2. Psychosocial impairment and need for treatment

Subjects with comorbid depressions showed significantly lower mean GAF scores than those with non-comorbid depressions (Table 2), and subjects with more than two comorbid disorders ($n = 12$) were significantly more impaired than those ($n = 21$) with only one comorbid disorder (mean GAF scores 47.5 vs. 55.2, mean difference 7.7, 95%CI (3.6,11.8), $P = 0.001$). Gender difference in impairment among subjects with any type of depression ($n = 67$) was non-significant (mean GAF of females 56.8 (S.D. 7.8) versus mean GAF of males 54.1 (S.D. 15.8), $P = 0.5$).

Of subjects with a depressive disorder, all but one with a comorbid disorder and two-thirds of those

Table 2
Twelve-month depression: comorbidity, impairment and treatment need

	Subjects (*n*)	Mean GAF score (S.D.)	% With impairment GAF < 61	% With need for psychiatric care
Depressive disorders (any)	53		75% (40)	85% (45)
Non-comorbid	21	61.3 (5.9)	48% (10)	67% (14)
Comorbid	32 (60%)	52.2 (7.3)***	94% (30)***	97% (31)**
Axis 1 comorbidity	29 (55%)			
MDD	41		79% (33)	81% (34)
Non-comorbid	14	61.1 (5.9)	50% (7)	57% (8)
Comorbid	27 (64%)	52.1 (7.6)***	93% (25)**	96% (26)**
Axis 1 comorbidity	25 (61%)			
Dysthymia	17		88% (15)	100%(17)
Non-comorbid	4	62.8 (5.6)	50% (2)	100% (4)
Comorbid	13 (76%)	48.6 (4.6)***	100% (13)*	100% (13)
Axis 1 comorbidity	13 (76%)			
Depressive disorder NOS	6		67% (4)	100% (5)
Non-comorbid	3	60.3 (8.1)	33% (1)	67% (2)
Comorbid	3 (50%)	55.0 (4.0)	100% (3)	100% (3)
Axis 1 comorbidity	2 (33%)			
Adjustment disorders	14		36% (5)	14% (2)
Non-comorbid	13	58.1 (15.8)	31% (4)	7% (1)
Comorbid	1 (7%)	60.0	100% (1)	100% (1)
Axis 1 comorbidity	0			
Depressive syndrome (any)	67		67% (45)	70% (47)
Non-comorbid	34	60.1 (10.7)	41% (14)	44% (15)
Comorbid	33 (49%)	52.4 (7.3)**	94% (31)***	97% (32)***
Axis 1 comorbidity	29 (43%)			

*$P < 0.05$, two-tailed test; **$P < 0.01$; and ***$P < 0.001$.

with a non-comorbid disorder were estimated to be needing psychiatric treatment. All subjects with dysthymia and more than four-fifths of those with MDD were considered in need of psychiatric care, contrasting with only two subjects with an adjustment disorder with depressed mood.

3.2. Psychiatric help-seeking

3.2.1. Use of psychiatric services

All prior psychiatric contacts had occurred during adolescence or early adulthood, the mean age of first treatment contact being 19.8 years (S.D. 1.8, range 16–23 years): 20.5 (S.D. 0.6) in males and 19.7 (S.D. 1.9) in females.

Treatment contacts during the index (12-month) episode were reported by approximately one-third and any prior contacts by one-half of subjects with any type of depression (Table 3). Subjects with dysthymia were the most and those with an adjustment disorder the least likely to report treatment seeking. Probability of treatment contacts increased by severity of disorder as measured by the level of impairment, comorbidity, and estimated need for treatment. The effect of comorbidity was more evident than that of impairment in determining treatment seeking: approximately one-half of subjects with comorbid depression compared to one-third of those with severe impairment reported psychiatric treatment contacts during the index episode (Table 3).

3.2.2. Intention to seek help

One-third of subjects with any type of depression had never intended to contact mental health services for their problems (Table 3). Among those with no prior contacts, intention to referral was least frequent

Table 3
Twelve-month depression: treatment contacts by disorder

	DSM-criteria	With impairment (GAF < 61)	With need for psychiatric care	Comorbid depression	Non-comorbid depression
Depressive disorders total	53	40	45	32	21
Never considered contacting mental health services	26% (14)	20% (8)	20% (9)	9% (3)	52% (11)
Considered but no contact	23% (12)	23% (9)	24% (11)	19% (6)	29% (6)
Treatment contact	51% (27)	55% (22)	56% (25)	72% (23)	19% (4)
Contact during index episode	34% (18)	38% (15)	40% (18)	50% (16)	10% (2)
MDD	41	33	34	27	14
Never considered contacting mental health services	22% (9)	15% (5)	12% (4)	4% (1)	57% (8)
Considered but no contact	19% (8)	21% (7)	21% (7)	15% (4)	29% (4)
Treatment contact	59% (24)	61% (20)	68% (23)	81% (22)	14% (2)
Contact during index episode	39% (16)	42% (14)	47% (16)	56% (15)	7% (1)
Dysthymia	17	15	17	13	4
Never considered contacting mental health services	12% (2)	7% (1)	12% (2)	0	50% (2)
Considered but no contact	18% (3)	20% (3)	18% (3)	15% (2)	25% (1)
Treatment contact	71% (12)	73% (11)	71% (12)	92% (12)	25% (1)
Contact during index episode	53% (9)	53% (8)	53% (9)	62% (8)	25% (1)
Depressive disorder NOS	6	4	5	3	3
Never considered contacting mental health services	50% (3)	50% (2)	60% (3)	67% (2)	33% (1)
Considered but no contact	33% (2)	25% (1)	40% (2)	33% (1)	33% (1)
Treatment contact	17% (1)	25% (1)	0	0	33% (1)
Contact during index episode	0	0	0	0	0
Adjustment disorder with depressed mood	14	4	2	1	13
Never considered contacting mental health services	53% (7)	25% (1)	0	0	54% (7)
Considered but no contact	29% (4)	25% (1)	0	0	31% (4)
Treatment contact ($n = 13$)	15% (2)	50% (2)	100% (2)	100% (1)	8% (1)
Contact during index episode ($n = 14$)	7% (1)	25% (1)	50% (1)	100% (1)	0%
Depressive syndrome total	67	44	47	33	34
Never considered contacting mental health services ($n = 66$)	32% (21)	20% (9)	19% (9)	9% (3)	53% (18)
Considered but no contact ($n = 66$)	24% (16)	25% (11)	23% (11)	18% (6)	29% (10)
Treatment contact ($n = 66$)	44% (29)	55% (24)	57% (27)	73% (24)	15% (5)
Contact during index episode ($n = 67$)	28% (19)	36% (16)	40% (19)	52% (17)	6% (2)

among subjects with adequate overall psychosocial functioning and non-comorbid depression. Again, comorbidity emerged as more important than impairment in determining treatment intention: nine of 10 subjects with a comorbid depression compared to four in five of those with severe impairment had at least considered contacting mental health services (Table 3).

3.2.3. Gender differences in treatment seeking

Treatment contacts during the index episode were reported by an approximately equal proportion (one-third) of both sexes, except for dysthymia (Table 4). The overall rate of previous treatment contacts was, however, higher among females than males. Males were more likely than females (half versus a third) not even to have considered referring to mental

Table 4
Twelve-month depression: gender differences in treatment behavior

	Total (*n*)	Males (*n*)	% Males	Females (*n*)	% Females
Depressive disorders total	53	10		43	
Never considered contacting mental health services	14	5	50	9	21
Intention but no contact to services	12	2	20	10	23
Treatment contact	27	3	30	24	56
Contact during index episode	18	3	30	15	35
MDD	41	8		33	
Never considered contacting mental health services	9	4	50	5	15
Intention but no contact to services	8	1	13	7	21
Treatment contact	24	3	38	21	62
Contact during index episode	16	3	38	13	38
Dysthymia	17	3		14	
Never considered contacting mental health services	2	1	33	1	7
Intention but no contact to services	3	1	33	2	14
Treatment contact	12	1	33	11	79
Contact during index episode	9	1	33	8	57
Depressive disorder NOS	6	1		5	
Never considered contacting mental health services	3	0	0	3	60
Intention but no contact to services	2	1	100	1	20
Treatment contact	1	0	0	1	33
Contact during index episode	0	0	0	0	0
Adjustment disorder with depressed Mood	14	4		10	
Never considered contacting mental health services ($n = 13$)	7	2	50	5/9	56
Intention but no contact to services	5	1	25	4/9	44
Treatment contact ($n = 13$)	2	2	50	0/9	0
Contact during index episode	1	1	25	0	0
Depressive syndrome total	67	14		53	
Never considered contacting mental health services ($n = 66$)	21	7	50	14/52	27
Intention but no contact to services	16	2	14	14/52	27
Treatment contact ($n = 66$)	29	5	36	24/52	46
Contact during index episode	19	4	29	15	29

health services for their problems; of females with no previous contacts one-half had at least considered contacting services. This overall gender difference was even more obvious in MDD: although males and females reported treatment contacts during the index episode equally often, almost two-thirds of females had previous contacts and only one-sixth had never considered referring to services for their problems. Males with MDD reported no other treatment contacts than those during the index episode, and half of males with MDD had never considered seeking psychiatric help (Table 4).

3.3. Double depression

More than two-thirds of subjects with dysthymia ($n = 11/17$) had developed an episode of MDD. This group, all in need of psychiatric care, was dis-

tinguished from other depressions by particularly low mean GAF scores (mean 48.5, S.D. 4.3, range 42–55). Treatment contacts were reported by all but one, and contact during the index episode by almost two-thirds ($n = 7$).

4. Discussion

The main findings can be summarized as follows. (1) The 12-month prevalence of depression among young adults was high, with 12.4% meeting DSM-IV criteria for major depression, 3.9% for dysthymic disorder, and 18.1% for any type of depression including adjustment disorders with depressed mood. (2) The majority of depressions were comorbid, depression usually occurring after other mental disorders. Comorbidity was associated with more severe impairment and treatment seeking. (3) Depressed young adults were severely undertreated: even of those with severe psychosocial impairment, less than one-fifth had contacted mental health services during the 12-month episode. (4) A clear female preponderance was found in overall rates of psychiatric treatment contacts and intention to service use among those with no contacts, but no such gender difference was found in rates of episode-related contacts.

4.1. Limitations and strengths of the study design

There are several limitations that need to be considered in generalizing the findings of this study. First, the sample comprised young people with urban or suburban high-school backgrounds, and was thus not fully representative of all Finnish 20–24-year-olds. Secondly, the number of interviewed males was relatively low, so interpreting results concerning gender differences requires caution. Thirdly, since data on illness course and prior treatment contacts were gathered retrospectively, they were sensitive to recall error bias. On the other hand, we consider that adopting the LEAD Standard methodology (Spitzer, 1983) strengthened the diagnostic procedure. Careful case ascertainment and use of best-estimate diagnoses to complete diagnostic data from standardized interviews allowed us to improve the validity of the research diagnoses and minimize overdiagnosing milder forms of disorders common in community studies (Regier et al., 1998).

4.2. Strengths and weaknesses in relation to other studies

Despite the vast amount of research on depression, only a few other studies have reported prevalence data specifically on youth in their transition to adulthood: the Dunedin birth cohort study examined the same individuals at age 18 (Feehan et al., 1994) and 21 years (Newman et al., 1996), and prevalence data for late adolescent and young adult age groups of the National Comorbidity Survey (NCS) have recently been reported (Kessler and Walters, 1998). The Epidemiological Catchment Area Study (ECA) (Regier et al., 1993a,b; Robins and Regier, 1991) provided data for a subsample with a broader age range of 18–29 years, as did the Early Developmental Stages of Psychopathology Study (EDSP) (Wittchen et al., 1998) by reporting data on 15–24-year-olds. Although all these studies examined service use, only Newman et al. (1996) reported age-specific service use rates for young adults.

Being based on a high school sample, our study may underestimate the rates of depression since high school dropouts and non-attenders were omitted. On the other hand, Hankin et al. (1998) in their reports on the Dunedin birth cohort sample have revealed depression rates and accompanying gender differences to be similar in university compared to nonuniversity subsamples, supporting the generalizability of results from a high-school sample such as the present one. Further, due to the two-phase design with a semistructured interview instrument, our interview sample was considerably smaller than in any aforementioned study. Instead, we devoted much attention to the accuracy of case ascertainment. We also included service use data with different types of depression, and investigated the process of treatment seeking among young people by evaluating not only treatment contacts but also their intention to contact services. Finally, we addressed the issue of incorporating impairment criteria in case definition. We therefore suggest that our data provide valuable and clinically valid prevalence and service use information on depression as it occurs among young people in their transition to adulthood.

4.3. Prevalence of depression

Roberts et al. (1998) recently concluded that caseness in epidemiology is best determined by the presence of both symptoms and impairment. In accordance we have reported separate prevalence estimates for depressions with and without impairment. However, comparisons with previous findings should be made using the prevalence estimates without impairment.

For major depression, studies have reported 1-year prevalence estimates of 15.6% (Kessler and Walters, 1998) and 16.8% (Newman et al., 1996) among 21–22-year-olds, 5.3% among 15–24-year-olds (Wittchen et al., 1998), and 2.9% among 18–29-year-olds (Robins and Regier, 1991). For dysthymia, prevalences have ranged from 2.2 to 3.0% (Newman et al., 1996; Regier et al., 1993a,b; Wittchen et al., 1998). Bearing in mind that the highly structured interviews applied in these studies tend to give higher prevalence estimates for disorders than semi-structured interviews (Roberts et al., 1998), our 12-month estimate of 12.4% for MDD is in line with those from other young adult samples (Kessler and Walters, 1998; Newman et al., 1996) but considerably higher than the estimates from samples with a broader age-range (Robins and Regier, 1991; Wittchen et al., 1998). Prevalence of dysthymia in the present study was slightly higher (3.9%) than previously reported (Newman et al., 1996; Regier et al., 1993a,b; Wittchen et al., 1998). Congruent with most prior studies, the female-to-male sex ratio in MDD was approximately 2:1.

Although the relation between adjustment disorders with depressed mood and other mood disorders is somewhat unclear (Lewinsohn et al., 1999), we included adjustment disorders with depressed mood within the concept of depression, yet reporting total rates of depression separately for depressive disorders and depressive syndrome (including adjustment disorders with depressed mood). Recently, Lewinsohn et al. (1999) reported the prognosis of adjustment disorder with depressed mood among late adolescents not to differ from that of adolescent MDD in predicting future MDD and non-affective disorders. In the present study, adjustment disorders differed from MDD in not showing the gender difference characteristic of depression but being as common in both sexes, only one subject with an adjustment disorder showing comorbidity as opposed to the highly comorbid MDD, as well as in comprising a smaller proportion than MDD of those with severe impairment or treatment need. Treatment seeking rates in adjustment disorders resembled those of the non-comorbid MDD. Of note is that incorporating impairment criteria in caseness seemed to solve the issue of whether to include adjustment disorders when estimating the prevalence of depression: the total prevalence of depressive disorders was very close to that of depressive syndrome when impairment was included in case definition.

4.4. Comorbidity in depression

Our 12-month comorbidity rate of MDD (64%) and corresponding rates from the NCS (63%) and the Dunedin study (67%) are remarkably similar (Kessler and Walters, 1998; Newman et al., 1996), indicating that comorbidity in depression among young adults is rather the rule than an exception. As previously reported in young adult (Newman et al., 1996; Wittchen et al., 1998) and adolescent (Birmaher et al., 1996) samples, comorbidity was related to severity of depression and treatment contacts. In accordance with earlier findings on adolescents (Birmaher et al., 1996; Rohde et al., 1991), young people with double depression were found to constitute a subgroup of particularly severe depression in terms of their poor psychosocial functioning.

In line with previous findings on adolescent (Birmaher et al., 1996) and young adult (Kessler and Walters, 1998) populations, depression tended to be secondary to other disorders. Data are, however, inconsistent on the temporal order of depression and substance use disorders, in both adolescents and adults (Biederman et al., 1995; Brook et al., 1998; Reinherz et al., 1993). We found substance use disorders to precede depression, but Kessler and Walters (1998) recently reported depression to precede substance use disorders among young adults in the much larger NCS sample.

4.5. Treatment seeking of depressed young adults

Unlike studies reporting contact rates for the past year (Kessler et al., 1999; Kessler and Walters, 1998;

Newman et al., 1996) or over the lifetime (Wittchen et al., 1998), we reported contacts that occurred during the index depression episode, including those before the past year if made during the course of the episode. Rates for past year treatment contacts would have been lower than the ones reported here, especially concerning dysthymia. The data do not reveal how many of those contacting services actually received proper treatment for their depression, but only to what extent depressed late adolescents and young adults sought mental health services during the course of their depression, and to what degree the seriousness of depression determined treatment seeking.

Our episode-related contact rates of 39% for MDD and 53% for dysthymia are well in line with the past-year contact rates of 37.3% for MDE and 50.0% for dysthymia documented among 21-year-olds by Newman et al. (1996). Among the 15–24-year-olds in the NCS (Kessler et al., 1999), reported treatment rates were lower (26.7% for MDD and 26.0% for dysthymia), as were lifetime rates of 24% for single and 40% for recurrent major depression, and 46% for dysthymia in a mixed adolescent–young adult sample (aged 14–24) reported by Wittchen et al. (1998). The ECA Study found that approximately one-half of the whole sample aged 18 years or more with unipolar major depression or dysthymia had reported psychiatric service use during the past year (Narrow et al., 1993; Regier et al., 1993a,b).

As previously (Kessler et al., 1999; Newman et al., 1996; Regier et al., 1993a,b; Rohde et al., 1991; Wittchen et al., 1998), seriousness of depression was related to treatment use as measured by the level of impairment or comorbidity in disorders. The greater the estimated level of impairment or number of disorders, the greater was the proportion of subjects with contacts within each disorder category, and the smaller the proportion of those with no prior intention to service use. The role of comorbidity was evident in that while half of subjects with a comorbid depression reported treatment seeking during the index episode, only one in 10 with a non-comorbid depression had sought psychiatric help. Also congruent with previous findings among adolescents (Lewinsohn et al., 1994) and adults (Weissman et al., 1988) was that the probability of treatment seeking seemed to relate to the duration of depression: dysthymia associated with the highest and adjustment disorders with the lowest contact rates, possibly indicating that the level of distress was increased by the persistence of underlying depression. Most young adults had not, however, contacted treatment services. Even among those with serious impairment in psychosocial functioning only one-third had sought treatment during their depression.

Although the factors affecting treatment seeking among late adolescents and young adults are obscure, intention to refer to services might somewhat reflect the level of perceived distress due to depression among those with a disorder but no treatment contacts. One-third of subjects with any type of depression had never considered referring to mental health services. This may indicate that many subjects with depression according to DSM-IV symptom criteria experience no need for professional help for their symptoms, giving further support for the use of additional diagnostic criteria in producing clinically significant prevalence data. On the other hand, the discrepancy between rates of depression and treatment seeking may reflect the inability of young adults, particularly males, to recognize their depression. Since comorbidity more clearly than psychosocial impairment seemed to relate to treatment seeking (both contacts and intention), this finding further emphasizes the importance of exposing comorbidity in clinical practice to identify subjects with the most severe depressions. Similarly to those with fulfilled contacts, among subjects with depression but no treatment contacts those diagnosed as dysthymic showed the most and those with adjustment disorders the least intention to refer to services.

4.6. Gender differences in treatment seeking

The total prior contact rates were higher among females. Moreover, young adult males were more likely not even to have thought of referring to mental health services. This might be due to a gender difference in the ability of young people to identify their depressive symptoms. With the exception of subjects with dysthymia, however, no gender difference was found in rates of episode-related treatment contacts. When interpreting this result it has to be kept in mind that our sample consisted of relatively

well-educated young people with urban backgrounds. The males and females in the present study may represent more homogeneous attitudes towards treatment seeking than generally prevail. Also, the fact that young people studying at universities in Finland have easier than average access to mental health specialty services may have had some effect on the help-seeking behavior of these subjects.

4.7. Clinical implications

The present findings agree with earlier results in finding depression in early adulthood to be common, usually related to substantial impairment in psychosocial functioning, and being highly comorbid with other mental disorders. As previously, depression tended to occur after other co-occurring disorders, and comorbidity was related to severity of depression and treatment contacts. We, too, have documented depressed young people to be notably undertreated (Kessler et al., 1999, Newman et al., 1996, Wittchen et al., 1998).

The present study exposes some further issues worth emphasizing. First, we consider it important to evaluate impairment with DSM-symptom criteria along with proper assessment of comorbidity in order to produce clinically significant prevalence data. This issue also has vital implications for treatment planning. Secondly, it emerged that only one-third of those with depression associated with severe impairment had sought services. This implies that a large group of severely depressed young adults needing clinical attention are currently beyond treatment. Efforts are needed to develop interventions to reach this group. Thirdly, double depression appeared to constitute a subgroup with particularly severe depression. As all but one of these subjects had at least contacted mental health services, in clinical practice it would be important to identify them to offer prompt treatment, paying special attention to the characteristics of double depression. Finally, young males with depression reported no other treatment contacts than during the index episode. Considering that half of depressed males had never even considered service use, this implies that initial contacts to services by young men should be taken seriously.

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BRIEF COMMUNICATION

Major depressive episode among young adults: CIDI-SF *versus* SCAN consensus diagnoses

T. AALTO-SETÄLÄ,[1] L. HAARASILTA, M. MARTTUNEN, A. TUULIO-HENRIKSSON, K. POIKOLAINEN, H. ARO AND J. LÖNNQVIST

From the National Public Health Institute, Department of Mental Health and Alcohol Research, Mannerheimintie; Helsinki-Uusimaa Hospital District, Department of Adolescent Psychiatry, Peijas Hospital, Vantaa; and the Finnish Foundation for Alcohol Studies, Helsinki, Finland

ABSTRACT

Background. We aimed to evaluate the diagnostic accuracy of a highly structured diagnostic interview in relation to a semi-structured diagnostic procedure. We compared the World Health Organization Composite International Diagnostic Interview Short Form (CIDI-SF) in diagnosing major depressive episode (MDE) to consensus diagnoses based on the SCAN interview (Schedules for Clinical Assessment in Neuropsychiatry).

Method. Subjects comprised a follow-up sample of 239 20–24-year-old former high-school students who were administered the SCAN and immediately thereafter the CIDI-SF. Concordance was estimated for 12-month MDE, using different cut-points of the CIDI-SF and for any affective disorders.

Results. Correspondence between instruments was moderate for MDE ($\kappa = 0{\cdot}43$, sensitivity 0·71, specificity 0·82), but better for any affective disorder ($\kappa = 0{\cdot}60$, sensitivity 0·70, specificity 0·90). Most false negatives suffered from their depression as much as those correctly identified by the CIDI-SF. False negativity was mainly due to not endorsing the stem questions of the CIDI-SF. Of the false positives almost half had an affective disorder other than MDE.

Conclusions. The CIDI-SF seems to function best in identifying a broader category of affective disorders. It could be useful in large-scale community surveys where more extensive psychiatric interviews are not feasible.

INTRODUCTION

In psychiatric epidemiology, two different types of interview procedures are used for diagnostic ascertainment. The interviewer-based format provides only general guidelines for conducting the interview, and is therefore suited to interviewers experienced in clinical psychiatry. The SCAN (Schedules for Clinical Assessment of Neuropsychiatry) (WHO, 1994) is an example of this approach. By contrast, highly structured respondent-based interviews such as the CIDI (Composite International Diagnostic Interview) (WHO, 1990), designed for large-scale epidemiological surveys, may be conducted by lay interviewers as they minimize the need for clinical interpretation and judgement. The reliability of the structured interviews is reportedly high (Andrews *et al.* 1995) while their validity regarding the clinical diagnostic procedure remains more controversial (Anthony *et al.* 1985; McLeod *et al.* 1990).

In a sample of Finnish non-clinical 20–24-year-olds with a high-school background, we investigated the diagnostic accuracy of the

[1] Address for correspondence: Dr Terhi Aalto-Setälä, Iirislahdenranta 30 A, FIN-02230 Espoo, Finland.

World Health Organization Composite International Diagnostic Interview Short Form (CIDI-SF) (Kessler *et al.* 1998) in relation to a semi-structured clinical diagnostic interview (SCAN) in assessing depression.

METHOD

Subjects and design of the study

The study sample and procedure is previously described in detail (Aalto-Setälä *et al.* 2001). The data were gathered in a larger 5-year follow-up of high-school students, first examined by questionnaires in 1990. Of the total of 1518 adolescents (mean aged 16·8 years, S.D. = 0·9) 1493 responded. No statistically significant differences between the 709 respondents (442 females, 276 males) consenting to follow-up and those not consenting were found in their family social class, school grade-point average, age, or various psychosocial variables measured at baseline (Aalto-Setälä *et al.* 2001).

In a two-phase follow-up in 1995, all but three of the 709 volunteers were first mailed a new questionnaire; two were excluded due to incomplete questionnaire data, and one male had died.

The main measure for screening psychiatric symptoms was the 36-item version of the General Health Questionnaire (GHQ) (Goldberg, 1972), a widely used self-administered rating scale for screening psychiatric disturbance in individuals in the general population. One-third ($N = 203$) of the 651 respondents scored above the conventional cut-point of five or more symptoms and were regarded screening positive (151 females and 52 males). An additional 89 subjects were screening positive according to their answers in questions charting lifetime referrals to mental health services, pathological eating behaviour, high yearly intake of alcohol and recurrent depressive feelings (Aalto-Setälä *et al.* 2001). Based on this procedure, 292 persons were invited to diagnostic interviews, forming the screening positive subgroup. The invited screening negative subgroup comprised 111 randomly selected subjects with no self-reported psychopathology. In all, 245 subjects (172 females and 73 males) completed the interviews. Of these, 197 (68%) were screening positive (47 males, 150 females) and 48 (26 males, 22 females) screening negative. The interviewed and non-interviewed subjects showed no statistically significant differences in their GHQ scores, family social class, age or sex (Aalto-Setälä *et al.* 2001).

The present study group comprised the 239 young adults (72 males and 167 females) mean aged 21·8 years (S.D. = 0·9) with completed data from both the SCAN and the CIDI-SF for MDE.

Interview procedure

At the same interview session, subjects were administered first the SCAN interview and thereafter the CIDI-SF for MDE by the same interviewer. The interviews were preceded by reviewing the main events of the subjects's life history. Before introducing the CIDI-SF, the subjects were informed that two different interview instruments would be compared, and the latter instrument would be very short. Subjects were encouraged to answer the questions independently of their answers in the preceding interview.

The SCAN consensus diagnoses

Diagnoses of depressive episodes and other DSM-IV (APA, 1994) mental disorders during 12 months preceding the interview were based on information from a semistructured diagnostic SCAN interview (SCAN 2.0) (WHO, 1994). In cases of more than one disorder episode, the most severe one was chosen for analysis. Information was recorded as a list of scores, and a summary was written of each interview. Interviews were audiotaped, with four exceptions.

At that time, programmed algorithms were not available for SCAN 2.0. Best-estimate research diagnoses were generated from the diagnostic interview information to maximize the validity of the research diagnoses. The diagnostic team, consisting of interviewers (T.A.-S. and A.T.-H.) and a senior consultant (M.M.), all experienced clinicians, made the diagnoses in two phases. First, the interviewers made preliminary DSM-IV Axis I research diagnoses by consensus, using DSM-IV hierarchy rules. Thereafter, all cases were reconsidered with the senior consultant. In unclear cases additional data (clinical observations,

other information from the interview and questionnaire) were used and tapes were re-examined.

The SCAN consensus MDE and SCAN consensus affective disorder

Of the 239 subjects, seven males and 30 females were diagnosed a 12-month MDE based on the SCAN consensus procedure. According to the DSM-IV classification, a diagnosis of major depression requires a 2-week period of either depressed or irritable mood or loss of interest or pleasure, and at least four other symptoms (APA, 1994). As the CIDI-SF diagnosis of major depressive episode also comprises depressive episodes of a bipolar disorder, these ($N = 3$) were included, giving 40 subjects diagnosed with SCAN consensus MDE. In further analyses of the data, an alternative reference group of 66 subjects (13 males, 53 females) was used, comprising also 12-month dysthymia, depressive disorder not otherwise stated (NOS) and adjustment disorders with depressed mood (SCAN consensus affective disorder).

The CIDI-SF

The CIDI-SF (Kessler *et al.* 1998) was used to generate a probability diagnosis of DSM-III-R (APA, 1987) MDE during the preceding 12-month period. The CIDI-SF was developed from the CIDI (WHO, 1990) by creating an optimum algorithm to reproduce CIDI diagnoses. Compared to CIDI, the CIDI-SF MDE diagnoses have shown sensitivity of 89·6% and specificity of 93·9% (Kessler *et al.* 1998).

The CIDI-SF MDE

The diagnosis of the CIDI-SF MDE was determined by the presence of depressed mood or anhedonia for at least 2 weeks, lasting at least half of the day, plus at lease two additional symptoms. The stem questions introduced to all subjects are: (1) During the past year, have you felt sad or depressed?; and (2) During the past year, have you lost interest in most things like work or hobbies or things you usually like to do for fun? Respondents endorsing the stem questions are asked further questions specifying the intensity and duration of the stem items and of other diagnostic symptoms. The cut-point chosen depends on the aim of the study (Kessler *et al.* 1998). As in another general population study using the CIDI-SF, the cut-point of three symptoms out of eight in total was applied (Haarasilta *et al.* 2001). This procedure identified 65 subjects (13 males and 52 females).

Measures used in the analyses of discrepant and non-discrepant data

Using a consensus procedure as described, evaluations of subjects' current level of overall psychological functioning on a scale 0–100 according to DSM-IV GAF (Global Assessment Functioning) scale (APA, 1994), and psychiatric treatment need were made (Aalto-Setälä *et al.* 2001).

Data analysis

Correspondence between SCAN consensus and CIDI-SF MDE diagnoses was evaluated by overall percentage agreement, sensitivity and specificity figures. In addition to unweighted kappa values (relevant for treatment seeking populations) we calculated weighted kappas, taking into account the two-stage study design (relevant for community studies). In the analyses of discrepantly identified subjects, chi-square procedures, Fisher's exact test and independent samples t test were applied. A probability levels $\leqslant 0{\cdot}05$ indicated statistical significance.

RESULTS

Forty subjects out of 239 (17%) were assigned a SCAN consensus MDE diagnosis during the past 12 months (Table 1). Any other (one or more) diagnosis was discovered in 54 subjects;

Table 1. *Correspondence of CIDI-SF MDE to SCAN consensus MDE and SCAN consensus affective disorder*

		SCAN consensus MDE*		SCAN consensus affective disorder†	
		+	−	+	−
CIDI-SF MDE	+	29	36	47	18
	−	11	163	19	155

* kappa = 0·44; sens 0·73; spec = 0·82; agreement 80·3%.
† kappa = 0·61; sens 0·71; spec = 0·90; agreement 84·5%.

Table 2. *Clinical characteristics relating to false-negative and false positive MDE diagnoses CIDI-SF MDE compared to SCAN consensus MDE*

Variable	A True positives ($N = 29$)	B False negatives ($N = 11$)	C False positives ($N = 36$)	Significance A *v.* B	Significance A *v.* C
Proportion females, %	83	82	78	NS	NS
Age (S.D.), years	21·8 (0·8)	21·5 (0·5)	21·9 (0·8)	NS	NS
Axis I non-affective co-morbidity, %	66	45	11	NS	0·002
Current MDE, %	69	55	11	NS	0·000
Psychological impairment (GAF < 61), %	76	64	22	NS	0·000
Need of psychiatric care, %	79	73	33	NS	0·000

A *v.* B: 29 true positives compared to 11 false negatives.
A *v.* C: 29 true positives compared to 36 false positives.

145 received no DSM-IV diagnosis. The CIDI-SF identified 65 subjects (27%) with MDE.

Of the 40 subjects with SCAN consensus MDE, the CIDI-SF correctly identified 29 ('true positives'), leaving 11 subjects undiagnosed ('false negatives'). Of the 199 subjects with no SCAN consensus MDE diagnosis, the CIDI-SF detected 36 ('false positives'); 163 subjects were not identified by either instrument ('true negatives'). Agreement between instruments was modest: kappa unweighted 0·44, kappa weighted 0·39, sensitivity 0·73, specificity 0·82 (Table 1).

The 29 true positive subjects were notably affected by their MDE: severe psychosocial impairment and a co-morbid disorder were discovered in more than two-thirds, and almost all were estimated to need psychiatric care (Table 2).

Among the false negative subjects, the majority were clearly impaired, almost half of the disorders were co-morbid, and three-quarters were estimated to need psychiatric care (Table 2). Indeed, no statistically significant differences were found between the false negative and the true positive groups regarding the correlates of MDE (Table 2). Further analyses revealed that out of the 11 false negatives, nine had answered 'no' to the very first stem question: one failed to meet the diagnostic criteria due to the low total depressive symptom score, and one due to the short daily duration of symptoms.

The false positives ($N = 36$) differed significantly from the true positives. The proportions of subjects with severe impairment (22%), treatment need (33%), and co-morbidity (11%) were considerably smaller than among the true positives or false negatives (Table 2). Case-by-case analysis of these subjects revealed that at the diagnostic level, almost half (44%, $N = 16$) actually had a mood disorder other than MDE: dysthymia ($N = 4$), depressive disorder NOS ($N = 3$); or adjustment disorder with depressed mood ($N = 9$). Reanalyses by comparison of CIDI-SF MDE to SCAN consensus any affective disorder resulted in higher specificity (0·90) and better agreement (κ non-weighted = 0·61, weighted 0·54) (Table 1).

To study the effect of tightening the caseness criteria of CIDI-SF MDE on accuracy rates, we performed reanalyses with higher CIDI-SF cut-points than the suggested three symptoms. By cut-point four 57 subjects were identified, with κ (unweighted) = 0·47, sensitivity 0·70, specificity 0·85; by five 46 subjects with $\kappa = 0{\cdot}60$, sensitivity 0·60, specificity 0·89; by cut-point six 29 subjects with $\kappa = 0{\cdot}34$, sensitivity 0·38, and specificity 0·89.

DISCUSSION

The correspondence between CIDI-SF major depression and SCAN consensus MDE was modest. Almost one-third of subjects diagnosed with SCAN consensus MDE (11 out of 40) remained unidentified by the CIDI-SF. Comparison to SCAN consensus diagnoses of any affective disorders produced better correspondence.

Recall error, although generally considered among risks for validity (McLeod *et al.* 1990; Wittchen *et al.* 1999) seems unlikely to explain inconsistencies in our study, since CIDI-SF was preceded by SCAN, which already had encouraged respondents to discuss their depression. Question misunderstanding, reportedly a problem in highly structured interviews (Brugha

et al. 1999*a*), may be a more important explanation, as the thorough approach of the SCAN allows the interviewer to ensure the correct interpretation of questions, not possible when administering the CIDI-SF.

Alternatively, respondents may have failed to duplicate acknowledgement of their episodes as they were too tired or otherwise reluctant to rediscuss their depression (McLeod *et al.* 1990; Wittchen *et al.* 1999). Moreover, having already completed the SCAN, subjects might have noticed that by answering 'no' to stem questions they could avoid being asked further related questions. This would partly explain why almost all the false negative subjects had answered negatively to the very first CIDI-SF stem question. On the other hand, some of the false positives may be subjects incorrectly unidentified by the SCAN: the risk of embarrassment influencing responding, for example, may be smaller in highly structured interviews as these allow more separation between the respondent and the interviewer (Wittchen *et al.* 1999).

That random ordering of instruments was not applied precludes evaluation to what extent the completion of the CIDI-SF was influenced by the preceding SCAN. A study comparing SCAN and CIDI with random ordering of instruments revealed lower concordance when CIDI followed SCAN (Brugha *et al.* 2001). The impact of the order of the applied instruments on results should indeed receive more attention in future studies. The close time proximity between interviews is reportedly an advantage (McLeod *et al.* 1990); yet in our study it precluded blind administering of the following CIDI-SF. On the other hand, some justification for introducing CIDI-SF after SCAN derives from the reportedly high reliability of the CIDI (Andrews *et al.* 1995) suggesting it not to be open to interpretation by the interviewer.

Milder forms of disorders predominate in community samples (Regier *et al.* 1998), emphasizing the importance of correct classification of threshold cases. High sensitivity is, however, reportedly difficult to obtain with highly structured interviews (Regier *et al.* 1998; Brugha *et al.* 1999*b*). In our diagnostic ascertainment, attention was paid in particular to this issue. The importance of threshold disorders is seen in that almost half of the false positive subjects were diagnosed other affective disorders than MDE. In a recent study many endorsed CIDI items were judged as subthreshold by SCAN (Brugha *et al.* 2001).

Our findings in relation to other studies

Different from earlier studies comparing CIDI-SF to CIDI (Patten, 1997; Kessler *et al.* 1998), we used a semi-structured interview as the 'gold standard'. Generally, levels of concordance between structured and clinical interviews among non-clinical samples tend to be poor (Brugha *et al.* 1999*a*). Recently, Brugha and colleagues (2001) compared CIDI and SCAN and reported κ of 0·15 for depressive episodes and 0·39 for any depressive disorders. In line with our findings, κ values first improved when raising the threshold for CIDI diagnosis but then worsened probably reflecting the influence of prevalence rates on κ values. We also found a steady increase in specificity and decrease in sensitivity by higher cut-points.

Also congruent with our findings, comparison of SCAN to DIS (Diagnostic Interview Schedule) (Robins *et al.* 1981) produced only fair agreement in assessing MDE, but better when diagnostic thresholds were set at the level of depression syndrome rather than specific diagnosis (Eaton *et al.* 2000). Using broader syndromal diagnosis instead of MDE may, however, involve problems, because in SCAN e.g. symptoms of dysthymia are asked using clinical checklists instead of formal rating of symptoms. Little work on the reliability of these aspects has yet been done.

Strengths and limitations of the study

The study was conducted in a non-clinical follow-up sample of young adults with high-school basis from urban and suburban environments, being therefore not representative of all 20–24-year-olds. Restricting to young adults with mostly first MDE episodes enabled us, however, to study depression at its initial stage. The relatively high attrition along the study is a limitation, since response readiness is likely to be affected by factors associated with the risk of psychopathology.

SCAN consensus diagnoses as the reference standard may imply pitfalls. The reliability of SCAN has not been established in community samples (Wittchen *et al.* 1999). Detailed replication of our findings is precluded since SCAN

algorithms were not applied for diagnoses. However, we ascertained the cases carefully using SCAN interview to ensure reliable data collection, and applied clinical judgement in making the research diagnoses. The comparison of DSM-III-R CIDI-SF MDE with DSM-IV SCAN consensus diagnoses involves problems mainly as impairment criteria is incorporated only in the latter criteria.

Implications

Regarding its diagnostic accuracy, the CIDI-SF seems to function best in identifying a broader category of affective disorders. It could be useful in large-scale community surveys where more extensive psychiatric interviews are not feasible.

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Brief Report

Depressive Symptoms in Adolescence as Predictors of Early Adulthood Depressive Disorders and Maladjustment

Terhi Aalto-Setälä, M.D.
Mauri Marttunen, M.D., Ph.D.
Annamari Tuulio-Henriksson, Lic.Phil.
Kari Poikolainen, M.D., Ph.D.
Jouko Lönnqvist, M.D., Ph.D.

Objective: The authors examined the association between self-reported depressive symptoms in adolescence and mental well-being in early adulthood.

Method: A questionnaire assessing psychosocial well-being was given to a group of subjects (N=651) in their last 3 years of high school (mean age=16.8 years) and again when these subjects reached early adulthood (mean age=21.8 years). Diagnostic interview data were obtained from a subgroup of the young adults (N=245). Adolescents' depressive symptoms were analyzed in relation to their early adulthood mental health outcome data.

Results: Depressive symptoms in adolescence predicted early adulthood depressive disorders (major depression and dysthymia), comorbidity, psychosocial impairment, and problem drinking.

Conclusions: Depressive symptoms in adolescence deserve attention as a potential risk for early adulthood mental disorders.

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The prevalence of depression increases during adolescence and peaks in early adulthood (1). Adolescent depression is related to early adulthood depression (1–3), higher occurrence of hospitalizations (2), social adjustment and interpersonal problems (2, 3), suicidality (2, 3), and dissatisfaction with life (3).

Correspondingly, adolescents with depressive symptoms that do not meet diagnostic criteria for a mood disorder have shown higher rates of early adulthood depression (4, 5), adverse psychological and social functioning (5), and substance abuse (5).

Previous studies have also shown evidence of the continuity of adolescent mood disorders (1, 4). Therefore, finding easy-to-use measures to identify those at risk would be valuable. As part of a larger follow-up investigation on mental health risk factors among Finnish high school students, we examined whether adolescents' self-reported depressive symptoms—as measured by a two-item query—predicted depressive and other psychiatric disorders in early adulthood.

Method

The study group and procedure have been described in detail (6). In 1990, a questionnaire that assessed psychosocial well-being was delivered to 1,518 adolescent high school students from two Finnish cities who were attending their final three grades. Of these adolescents, 1,493 responded (mean age=16.8 years); 709 (47.5%) of the 1,493 respondents provided written, informed consent to be contacted for follow-up. No statistically significant differences between respondents consenting and those not consenting to be recontacted were found in age, family social class, or psychosocial variables measured at baseline (6). Assessment of family social class followed the City of Helsinki social group classification and was based on the father's occupation or on the mother's occupation in cases where the father was not living in the family of the adolescent.

In 1995, 706 of the consenting subjects (mean age=21.8 years) were mailed a follow-up questionnaire. Of the 442 female subjects, 418 (94.6%) responded; of the 264 male subjects, 233 (88.3%) responded.

The main measure for screening psychiatric symptoms was the 36-item version of the General Health Questionnaire (7), a widely used self-administered rating scale for screening psychiatric disturbance in individuals of the general population. The General Health Questionnaire inquires about the occurrence of various psychological symptoms during the previous month. Scores of 3 and 4 on a 4-point scale indicate the presence of a symptom. The presence of five or more symptoms in total out of 36 indicates psychiatric disturbance (7). Of the 651 questionnaire respondents, 151 female and 52 male subjects scored above this cutoff point and were thus candidates for diagnostic interview. An additional 89 subjects (66 women and 23 men) were considered eligible for diagnostic interview on the basis of their responses to questions regarding lifetime referrals to mental health services, pathological eating behavior, high yearly intake of alcohol, or recurrent depressive feelings (6). Thus in total, 292 persons were considered eligible for diagnostic interviews (the "screening positive" subgroup). In addition, 111 randomly selected subjects with no self-reported psychopathology (the "screening negative" subgroup) were asked to undergo the diagnostic interviews. Of all eligible or invited, 245 subjects (172 women and 73 men) completed the diagnostic interviews (6). The interviewed and noninterviewed subjects did not significantly differ in terms of their General Health Questionnaire scores, family social class, age, or sex (6).

Depressive symptoms in adolescence were assessed by two items in the 1990 questionnaire ("I often get depressed," "I am continuously depressed") rated on a 4-point scale in which 1=no, 2=somewhat, 3=moderately so, and 4=very much so. In order to exclude subjects with transient depressive feelings, this measure was dichotomized so that presence of depressive symptoms was recorded only for scores of 3 or 4 on either question or both.

Measurement of psychiatric disturbance refers to a total score of 5 or more on the 36-item General Health Questionnaire (7). Problem drinking was defined as two or more positive answers on the four-item CAGE questionnaire (8), designed to detect alcohol problems (subject has been asked to cut down drinking, been an-

TABLE 1. Maladjustment and Psychopathology Among Young Adults Who Reported Depressive Symptoms in Adolescence[a]

Early Adulthood Outcome	Subjects With Outcome	Likelihood of Outcome: Adjusted Odds Ratio[b]	Likelihood of Outcome: 95% CI	Analysis: Beta	Analysis: p
Psychosocial well-being[c]					
Psychiatric disturbance (General Health Questionnaire score ≥5)	197	3.4	2.2–5.2	5.52	<0.0001
Problem drinking (CAGE questionnaire score ≥2)	195	1.6	1.0–2.4	1.96	<0.05
Psychopathology[d]					
Psychsocial impairment (Global Assessment of Functioning score ≤60)	37	3.5	1.6–7.6	3.12	0.002
Any DSM-IV axis I disorder	68	2.2	1.1–4.3	2.37	0.02
Axis I comorbidity	22	6.2	2.3–16.5	3.64	0.0003
Depressive disorder	31	3.2	1.4–7.5	2.74	0.006
Substance use disorder	14	0.9	0.2–3.7	-0.10	0.90
Anxiety disorder	20	1.9	0.7–4.9	1.23	0.20
Eating disorder	15	2.4	0.8–7.3	1.60	0.10

[a] Subjects had given a rating of 3 or 4 to the item "I often get depressed" or "I am continually depressed" or both on a questionnaire completed 5 years earlier.
[b] Determined by logistic regression analyses that adjusted for age, sex, and family social class.
[c] From a questionnaire given to 651 subjects who had completed the same questionnaire 5 years earlier. For psychiatric disturbance, General Health Questionnaire or family social class data were missing for 31 subjects. For problem drinking, CAGE questionnaire or family social class data were missing for 59 subjects.
[d] Determined with the Schedules for Clinical Assessment in Neuropsychiatry interview given to a subgroup of 245 subjects, eight of whom had missing data for family social class.

noyed by criticism of his or her drinking, felt guilty about drinking, or ever resorted to drinking as an "eye-opener").

Diagnostic interview data on the 245 subjects were collected by using the semistructured Schedules for Clinical Assessment in Neuropsychiatry (9), which cover the major psychiatric disorders of adult life. Preliminary DSM-IV axis I research diagnoses, based on the DSM-IV hierarchy rules, were first set by the two interviewers by consensus and thereafter reconsidered with the consultant (6). When needed, additional data based on the longitudinal expert all data standard (10) were used to maximize the validity of the research diagnoses. Only current disorders occurring during the past 4 weeks were considered in the present study. We used a similar procedure to assess current level of psychosocial functioning according to the DSM-IV Global Assessment of Functioning Scale. On a scale of 0–100, subjects with Global Assessment of Functioning Scale scores of 60 or less were considered impaired (6).

Adolescent depressive symptoms were analyzed against outcome data from questionnaire and interviews. We used logistic regression analyses to produce odds ratios for measuring the strength of associations between adolescent depressive symptoms and each early adulthood outcome. Age of respondent, family social class at baseline, and sex were used as covariates in each logistic model.

Results

Baseline depressive symptoms were reported by 112 (17.2%) of the 651 questionnaire respondents and 60 (24.5%) of the 245 administered the diagnostic interviews.

Depressive symptoms in adolescence predicted significantly greater risk of psychiatric disturbance and problem drinking in young adulthood (Table 1). Analyses of the diagnostic data revealed that adolescent depressive symptoms predicted a two-fold risk of a subject experiencing any DSM-IV axis I disorder and a six-fold risk of experiencing any two co-occurring DSM-IV axis I disorders. Compared with subjects who did not report depressive symptoms in adolescence, the risk of early adulthood depressive disorders (major depressive disorder or dysthymia) was threefold and that of psychosocial impairment 3.5-fold among those reporting depressive symptoms in adolescence.

Discussion

Adolescent depressive symptoms predicted a high risk of depression, psychiatric comorbidity, and psychosocial impairment in young adulthood. Symptoms of depression in adolescence also predicted subsequent psychiatric disturbance and problem drinking.

Lack of diagnostic data at baseline precluded controlling for the presence of depressive disorders at that time. Furthermore, we are aware that besides depressive symptoms, a range of other factors are probably associated with greater risk of the reported outcomes.

We consider the strengths of the present study to include the homogeneity of the study group of adolescent high school students, the follow-up design, and the careful diagnostic procedure.

Our results agree with prior findings (4, 5) in showing the important predictive impact of adolescent depressive symptoms on subsequent depressive disorders, psychosocial impairment, and problem drinking. Our findings suggest that even a two-item measure may identify adolescents at greater risk of subsequent depression and maladjustment. Subclinical depressive symptoms in adolescence, not merely clinical depression, should be a focus of further research and clinical interest.

Received July 14, 2000; revisions received Feb. 20 and Nov. 26, 2001; accepted Jan. 22, 2002. From the Department of Mental Health and Alcohol Research, National Public Health Institute. Address reprint requests to Dr. Aalto-Setälä, Department of Mental Health and Alcohol Research, National Public Health Institute, Iirislahdenranta 30, FIN-02230 Espoo, Finland.

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