The 12-month prevalence and characteristics of major depressive episode in a representative nationwide sample of adolescents and young adults

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ABSTRACT

Background. This study set out to estimate the 12-month prevalence of DSM-III-R major depressive episode (MDE) and to analyse factors associating with psychosocial impairment, episode duration, phenomenology and symptom severity in a representative general population sample of adolescents (15–19-year-olds) and young adults (20–24-year-olds).

Method. The Finnish Health Care Survey '96 (FINHCS '96) was a cross-sectional nationwide epidemiological study. A random sample of 509 adolescents and 433 young adults was interviewed in 1996. MDE was assessed by University of Michigan Composite Diagnostic Interview Short-Form.

Results. The 12-month prevalence of MDE was 5·3% for adolescents (females 6·0%, males 4·4%) and 9·4% for young adults (females 10·7%, males 8·1%). When moderate psychosocial impairment was included in case definition, the prevalences were lowered by 20–25%. Increased impairment was associated with drunkenness at least twice a month, a higher mean number of depressive symptoms and impaired concentration. The median episode duration was 1 month. No factors associating with duration were found. With the exception of symptoms related to appetite being more common among females than males, the phenomenology of MDE was mainly independent of age and gender.

Conclusions. Episodes of major depression among adolescents and young adults in the general population are short but often associated with psychosocial impairment, especially if frequent drunkenness coexists.

INTRODUCTION

Data on the frequency and characteristics of major depression in adolescence are essential in establishing empirically derived knowledge for both scientific purposes and planning of services. Together with an increase in lifetime rates of major depression a decrease in the age of onset in more recent birth cohorts has been observed (Kessler & Walters, 1998). Studies including adolescents or young adults and using structured diagnostic interviews and DSM criteria (APA,

1994) for major depressive disorder (MDD) or major depressive episode (MDE) have reported the 12-month prevalence to range from 3·4 to 16·8% (Fergusson *et al.* 1993; Newman *et al.* 1996; Kessler & Walters, 1998; Wittchen *et al.* 1998; Oldenhinkel *et al.* 1999; Olsson & von Knorring, 1999). Reported point prevalences vary between 0·7 and 6·1% (e.g. Fergusson *et al.* 1993; Regier *et al.* 1993; Blazer *et al.* 1994) and lifetime rates between 3·6 and 24·0% (e.g. Canino *et al.* 1987; Lewinsohn *et al.* 1993; Kessler & Walters, 1998; Wittchen *et al.* 1998). The roughly equal female to male ratio of major depression in childhood changes after puberty, adolescent females having approximately twice

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the risk of males for depression, corresponding to the sex ratio in adults (Fleming & Offord, 1990; Cyranowski *et al.* 2000).

Improved understanding of the phenomenology of depression among young people is needed to improve recognition and classification. Studies conducted in clinical populations show that although age modifies symptom frequency, the core phenomenology of depression is similar from childhood to adulthood (Strober *et al.* 1981; Ryan *et al.* 1987; Carlson & Kashani, 1988; Mitchell *et al.* 1988). The frequencies of diagnostic symptoms by age and gender as well as their associations with other characteristics of MDE, has been little studied in the general adolescent population (Roberts *et al.* 1995; Goodyer & Cooper, 1993). Existing data on the differences between clinical and general population samples suggest that the phenomenology of depression would be roughly similar in community and clinical samples with the understandable exception of suicidal thoughts and behaviour being more common in clinical populations (Roberts *et al.* 1995).

Few epidemiological studies in adolescent samples have assessed characteristics of major depressive episode such as duration and severity (Roberts *et al.* 1998). In clinical samples mean episode duration has been estimated to vary between 7 and 9 months (Birmaher *et al.* 1996). Episodes in the general population might be shorter although reports are inconsistent. Estimates of median duration have varied between 8 (Lewinsohn *et al.* 1994) and 16 weeks (Keller *et al.* 1988). Goodyer & Cooper (1993) reported that 64% of depressed girls had an episode lasting between 2 and 4 weeks. In the National Comorbidity Survey (NCS) the mean duration of the longest episode of MDD among 15–24-year-olds was 32·5 weeks (Kessler & Walters, 1998). Oldenhinkel *et al.* (1999) reported that less than half of those with MDD recovered during a 20-month follow-up, and in a Swedish study of high school students most subjects with MDD had long (over 12 months) episodes (Olsson & von Knorring, 1999). Persistence of major depression has been linked with severity (Lewinsohn *et al.* 1994; Oldenhinkel *et al.* 1999), older age (Oldenhinkel *et al.* 1999), suicidal ideation and treatment seeking, onset of MDD before age of 15 years (Lewinsohn *et al.* 1994) and co-morbidity (Keller *et al.* 1988).

It has been argued that categorical diagnostic information on depressive symptoms is not sufficient, with additional dimensional information on psychosocial impairment being needed in case ascertainment (Costello *et al.* 1996; Simonoff *et al.* 1997; Roberts *et al.* 1998; Oldenhinkel *et al.* 1999). Differing from DSM-III-R (APA, 1987) this is also indicated by DSM-IV (APA, 1994), which requires the presence of 'clinically significant impairment' for diagnosis of MDE. It is difficult to operationalize impairment in general population studies often conducted by lay interviewers (Frances, 1998), and variation in criteria and instruments may lead to differing caseness-criteria (Shaffer *et al.* 1996). Reported proportions of adolescents or young adults with psychosocial impairment related to MDD vary from 30% to almost 100% (Newman *et al.* 1996; Shaffer *et al.* 1996; Simonoff *et al.* 1997; Verhulst *et al.* 1997; Kessler & Walters, 1998; Wittchen *et al.* 1998). In adolescents, subthreshold depressive symptoms are common (Kessler & Walters, 1998) and longitudinal studies show that both depressive symptoms and impairment independently contribute to outcome (Costello *et al.* 1996; Oldenhinkel *et al.* 1999). Increased impairment has been linked with co-morbid psychiatric disorders (Wittchen *et al.* 1998), but information on how it is related to other characteristics or correlates of MDE is scarce (Bird *et al.* 1988).

This study set out to estimate the 12-month prevalence of MDE in a representative nationwide sample consisting of two developmentally different age groups, adolescents (15–19 years) and young adults (20–24 years). Another aim was to estimate the symptom prevalence of DSM-III-R MDE, and to analyse factors associating with the phenomenology of MDE by age and gender. We further analysed the correlates for psychosocial impairment, severity and duration of MDE among depressed adolescents and young adults.

METHOD

Subjects and procedure

This study forms part of the National Finnish Health Care Survey (FINHCS '96), an epidemiological population-based cross-sectional study designed to monitor the health of the general

population and evaluate the use of and need for health services. The methodology is described in detail elsewhere (Arinen *et al.* 1998; Lindeman *et al.* 2000). Professional interviewers employed by Statistics Finland and trained in the survey conducted the interviews between 5 April and 21 June 1996. The design was a one-stage cluster sampling in which households formed the clusters. Households were selected by first drawing a random sample of reference persons from the population register. A household was defined as married or cohabiting persons living permanently in the same dwelling; their parents and unmarried children were included if they, too, lived there and shared living costs. Reference persons living alone were regarded as households, too, but institutionalized persons were excluded. The members of the household of each reference person were identified from the population register.

The households were sent a letter informing them of their selection for the study and the interview appointment. All subjects were fully informed, and gave formal verbal consent in accordance with the Personal Data File Act. The household participation rate of completed interviews was 86% (3614 of 4200 households) (Lindeman *et al.* 2000). Diagnostic interviews were given to 5993 persons (82·2% of the original sample) aged 15–75 years. Data on absent household members excluding the diagnostic interview on MDE were collected by proxy interviews.

The FINHCS '96 sample is closely comparable with the entire Finnish population (Lindeman *et al.* 2000). Non-institutionalized 15–19- and 20–24-year-old inhabitants of Finland in 1996 formed the basic target population of the present study. The participating households included 1357 15–24-year-olds, of whom 29 (2·1%) refused to participate and 20 (1·5%) were not reached or otherwise could not be interviewed. Interview data were collected on 792 adolescents (401 males, 391 females) and 516 young adults (272 males, 244 females). Proxy interviews, which were excluded, were conducted for 284 adolescents (35·8%) and 82 young adults (15·9%) ($\chi^2 = 62\cdot441$, $P < 0\cdot001$), more frequently among males than females both among 15–19-year-olds ($N = 173$, 43·1% *v.* $N = 110$, 28·1%, $\chi^2 = 19\cdot420$, $P < 0\cdot001$) and 20–24-year-olds ($N = 63$, 23·2% *v.* $N = 19$, 7·8%,

$\chi^2 = 21\cdot889$, $P < 0\cdot001$). There were no other statistically significant differences in sociodemographics. The final sample thus consisted of 509 adolescents (281 females, 228 males) and 433 (224 females, 209 males) young adults. The study sample was demographically representative of the general population (Table 1).

Measures

Diagnostic interview and characteristics of MDE

The data were collected by the Computer Assisted Personal Interviewing (CAPI) technique. The University of Michigan Composite International Diagnostic Interview Short-Form (UM-CIDI SF) (Kessler *et al.* 1998*a*) was used to generate a probability diagnosis of DSM-III-R MDE during the preceding 12-month period. UM-CIDI 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. In WHO field trials the CIDI has had good inter-rater reliability, test–retest reliability and validity in most diagnostic categories, including affective disorders (Wittchen, 1994). Studies of reliability and validity of UM-CIDI have been conducted (Kessler *et al.* 1998*b*), and calculating from the data provided by Blazer and co-workers (1994) the estimates were 0·7 for sensitivity and 0·8 for specificity for the MDE section.

To produce UM-CIDI SF a subsample of respondents endorsing the CIDI diagnostic stem questions in the NCS has been studied and the short-form items for an optimal algorithm to predict reproduction of full CIDI diagnoses thereby selected (Kessler *et al.* 1998*a*). One stem question on the intensity of depressed mood was added to operationalize persistence of depressive symptoms (Kessler *et al.* 1998*a*). Psychomotor disturbance is not assessed and the total number of diagnostic symptoms to be endorsed in UM-CIDI SF is eight, differing from the total of nine items in DSM-III-R.

According to the diagnostic algorithm of UM-CIDI SF the diagnosis of MDE was determined by the presence of depressed mood or anhedonia for at least 2 weeks and most times of day, plus at least two additional symptoms of depression (memo Kessler and Mroczeck, Kessler *et al.* 1998*a*). The cut-point of three

Table 1. *Distribution of sociodemographic variables (crude rates) among Finnish Health Care Survey '96 (FINHCS '96) respondents and the Finnish population in* 1996

	15–19 years, FINHCS '96 (N = 509)		15–19 years, Finnish population 1996 (N = 325344)	20–24 years, FINHCS '96 (N = 433)		20–24 years, Finnish population 1996 (N = 310629)
	(N)	%	%	(N)	%	%
Sex						
Males	(228)	44·8	51·0	(209)	48·3	51·2
Females	(281)	55·2	49·0	(224)	51·7	48·8
Highest level of completed education						
Basic education	(301)	59·1	*	(40)	9·2	*
High school	(54)	10·6	*	(192)	44·3	*
Vocational school	(32)	6·3	*	(179)	41·3	*
Ongoing basic education	(109)	21·4	*	(0)		*
Others	(13)	2·6	*	(22)	5·1	*
Employment						
Employed	(59)	11·6	9·8	(166)	38·3	37·8
Unemployed	(19)	3·7	5·0	(81)	18·7	17·9
Students	(416)	81·7	79·5	(162)	37·4	37·9
Others	(15)	2·9	5·7	(24)	5·5	6·4
Region						
Southern Finland	(304)	59·7	57·4	(276)	63·7	61·5
Eastern Finland	(79)	15·5	14·2	(54)	12·5	12·6
Western Finland	(66)	13·0	15·5	(58)	13·4	14·3
Northern Finland	(60)	11·8	12·8	(45)	10·4	11·6
Urbanicity						
Urban municipality	(256)	50·3	56·1	(288)	66·5	66·5
Semi-urban	(104)	20·4	17·2	(54)	12·5	13·6
Rural municipality	(149)	29·3	26·7	(91)	21·0	19·9
Marital status						
Not married or cohabiting	(490)	96·3	96·5	(287)	66·3	68·4
Married or cohabiting	(19)	3·7	3·5	(146)	33·7	31·6

* Fully comparable data not available.

symptoms has been suggested as an optimal dichotomous classification rule to define caseness in MDE (memo from Kessler and Mroczeck, 1994). With increasing number of symptoms required for the diagnosis the probability of caseness increases (Kessler *et al.* 1998 *a*) but the price of this would most likely be the misclassification of the milder major depression cases commonly encountered in community.

The data on SF scales suggest that diagnostic classification of the CIDI can be reproduced with moderate to excellent accuracy with the MDE Short-Form, indicated by sensitivity of 89·6, specificity of 93·9 and overall classification accuracy of 93·2 % (Kessler *et al.* 1998 *a*). In a clinical sample applying a cut-point of five symptoms sensitivity of 0·98 and specificity of 0·72, when compared with the CIDI, have been reported (Patten *et al.* 1997). An external study comparing the accuracy of the Finnish translation of UM-CIDI-SF to a semi-struc-

tured clinical interview is ongoing in a sample of young adults. The preliminary results show satisfactory sensitivity and specificity.

The duration of the worst episode was assessed. A categorical item on psychosocial impairment (severe, moderate, mild, none) was included in UM-CIDI SF. The application of a cut-point of moderate impairment in the analyses is based on a previous work by Bird *et al.* (1988) concluding that moderate impairment best correlates with other measures of adaptation.

Independent variables

The FINHCS '96 included several items related to general health and health behaviour. In addition to the gender, age, region of residence and urbanicity the following variables were used in this study. Educational (1 = ongoing basic education, 2 = basic education completed, 9 years, 3 = high school graduate, 12 years, 4 =

Table 2. *The* 12-*month prevalence of major depressive episode among adolescents* (15–19 *years*) *and young adults* (20–24 *years*)

Age, years	Females (N = 505)		Males (N = 437)		Total (N = 942)		F:M
	N (%)	(95% CI)	N (%)	(95% CI)	N (%)	(95% CI)	OR (95% CI)
15–19 (N = 509)	17 (6·0)	(3·2, 8·7)	10 (4·4)	(1·8, 7·0)	27 (5·2)	(3·3, 7·2)	1·38 (0·62, 3·07)
20–24 (N = 433)	24 (10·7)	(6·6, 14·7)	17 (8·1)	(4·4, 11·8)	41 (9·4)	(6·7, 12·2)	1·36 (0·71, 2·62)
Total (N = 942)	41 (8·1)	(5·7, 10·4)	27 (6·1)	(3·9, 8·4)	68 (7·2)	(5·5, 8·8)	1·34 (0·81, 2·22)
YA:A, OR (95% CI)	1·89	(0·99, 3·62)	1·92	(0·86, 4·27)	1·88	(1·44, 3·12)	

OR, odds ratio; 95% CI, 95% confidence interval; F, female; M, male; YA, young adult; A, adolescent.

vocational school graduate, 5 = others) and employment status (1 = employed, 0 = unemployed) were assessed. A variable differentiating those working from full-time students was created (1 = working, 0 = student). Marital status was defined (1 = married or cohabiting, 0 = not married or cohabiting).

Substance use was assessed by six questions concerning alcohol consumption and cigarette smoking. All the interviewees were asked how often (once a day, once a week, 2–3 times a month, once a month, never) they drank alcohol and how often (once a week, 2–3 times a month, once a month, never) they drank until drunkenness. These items were combined into a categorical variable of 'frequent drunkenness' (1 = drunkenness at least twice a month, 2 = drunkenness once a month, 3 = never drunk). Information on lifetime and current smoking and number of cigarettes smoked daily was gathered. In the final data analysis the variable for smoking was dichotomized (1 = currently smokes more than 10 cigarettes/day, 0 = others).

All persons were asked to name any chronic or otherwise disabling somatic illness or symptom and whether this condition was assessed by a physician. Distinct categories were created for the most prevalent somatic complaints (e.g. allergies, respiratory tract symptoms, headache). Physical exercise lasting at least 30 minutes was recorded.

Statistical procedures

To adjust for differential participation rates and estimate population prevalence, the respondents were post-stratified by region, age group and sex, and then weighted to correspond to the distribution of the target population. Pre-valences of MDE by age and gender and their 95% confidence intervals were calculated, taking into account the household sampling procedure and the aforementioned weighting, using STATA software (Stata Corp., 1999). In analyses including only the subgroup of the respondents with MDE weighting was not applied and parametric (two-tailed t test) and non-parametric tests (Mann–Whitney U test, χ^2, Fisher's exact test) were used for comparisons when appropriate, using SPSS software (SPSS, 1999). In hypothesis testing the $P \leqslant 0.05$ level was considered statistically significant, and P values between 0·05 and 0·1 are reported as trends.

RESULTS

Twelve-month prevalence of MDE

In all, 27 of the 509 15–19-year-olds and 41 of the 435 20–24-year-olds received a diagnosis of MDE, corresponding to a 12-month prevalence of 5·3% for adolescents and 9·4% for young adults (Table 2). When at least moderate psychosocial impairment was required for caseness the prevalence of MDE was 5·6% (95% CI 4·12, 7·04) for 15–24-year-olds, 3·9% (95% CI 2·22, 5·57) for adolescents, 7·6% (95% CI 5·08, 10·1) for young adults, 6·3% (95% CI 4·17, 8·39) for females and 4·8% (95% CI 2·79, 6·78) for males.

The frequencies of MDE symptoms

The prevalences of UM-CIDI SF stem questions in the study population appear in Table 3. Females and young adults reported depressed mood more frequently than males and adolescents. When the requirements for the persistence and frequency of dysphoria were

Table 3. *The prevalence of the UM-CIDI Short-Form stem questions among the respondents*

UM-CIDI Short-Form stem questions	Total (N = 942)		Females (N = 505)		Males (N = 437)		Adolescents (N = 509)		Young adults (N = 433)	
	(N)	%*	(N)	%*	(N)	%*	(N)	%*	(N)	%*
Depressed mood	(110)	11·7	(69)	13·6	(41)	9·5†	(43)	8·4	(67)	15·5‡
Most times of the day	(51)	5·4	(32)	6·3	(19)	4·3	(20)	3·9	(31)	7·2§
Every day	(49)	5·2	(31)	6·1	(18)	4·1	(20)	3·9	(29)	6·7
Anhedonia	(69)	7·4	(37)	7·3	(32)	7·5	(36)	7·2	(33)	7·7
Most times of the day	(25)	2·7	(12)	2·3	(13)	3·1	(11)	2·2	(14)	3·2
Every day	(23)	2·4	(10)	2·0	(13)	3·1	(9)	1·8	(14)	3·2

* Weighted prevalence.
† Age- and sex-adjusted logistic regression: females to males OR 1·55; 95% CI (1·02, 2·35).
‡ Age- and sex-adjusted logistic regression: young adults to adolescents OR 1·99; 95% CI (1·32, 2·98).
§ Age- and sex-adjusted logistic regression: young adults to adolescents OR 1·94; 95% CI (1·08, 3·4).

Table 4. *The frequency of DSM-III-R diagnostic symptoms included in UM-CIDI SF among respondents with major depressive episode (MDE)*

Symptom prevalence among respondents with MDE	MDE+ (N = 68)		Females (N = 41)		Males (N = 27)		Adolescents (N = 27)		Young adults (N = 41)	
	(N) %	Rank	(N) %	Rank	(N) %	Rank	(N) %	Rank	(N) %	Rank
Depressed mood	(61) 89·7	1	(36) 87·8	1	(25) 92·6	2	(22) 46·8	3	(39) 65·0	1
Anhedonia	(60) 88·2	2	(33) 80·5	3	(27) 100	1	(25) 53·2	1	(35) 58·3	2
Fatigue	(45) 66·2	4	(27) 65·9	4	(18) 66·7	5	(20) 42·6	4	(25) 41·7	5
Appetite, increase	(8) 11·8	8	(7) 17·1	8	(1) 3·7*	9	(4) 8·51	8	(4) 6·67	9
Appetite, decrease	(29) 42·6	7	(27) 65·9	4	(7) 25·9*	8	(11) 23·4	7	(23) 38·3‡	7
Insomnia	(45) 66·2	4	(25) 61·0	5	(20) 74·1	4	(20) 42·6	4	(25) 41·7	4
Impaired concentration	(59) 86·8	3	(35) 85·4	2	(24) 88·9	3	(25) 53·2	1	(34) 56·7	3
Worthlessness	(38) 55·6	5	(24) 58·5	6	(14) 51·9	6	(14) 29·8	6	(24) 40·0	6
Thoughts of death	(31) 45·6	6	(22) 53·7	7	(9) 33·3†	7	(10) 37·0	5	(21) 35·0	8

* Females to males P < 0·05 (Fisher's exact test).
† Females to males P = 0·1 (chi-square test).
‡ Young adults to adolescents P = 0·1 (chi-square test).

applied the differences in gender and age became insignificant (female to male OR 1·55, 95% CI 0·85, 2·83; young adult to adolescent OR 1·79, 95% CI 0·99, 3·23). The endorsement of anhedonia stem questions did not vary significantly by age or gender. Notably, 68 of the 72 respondents (94·4%) reporting persistent depressed mood or anhedonia lasting at least 2 weeks received a diagnosis of MDE.

DSM-III-R symptoms present in over 80% of the 68 subjects with MDE were depressed mood, anhedonia and impaired concentration, followed by insomnia, fatigue and worthlessness, in over 50% (Table 4). Frequent thoughts of death were reported by 45·6% of those with MDE. The trend of females reporting more thoughts of death than males did not reach statistical significance (OR 2·32; 95% CI 0·85, 6·35). Females reported more commonly both decrease

(OR 2·4; 95% CI 1·2, 4·8) and increase (OR 5·16; 95% CI 0·81, 32·9) of appetite. No other gender differences emerged and only minor age differences occurred in the rank order of diagnostic symptoms (Table 3). Those with moderate or severe psychosocial impairment had more frequently impaired concentration (Fisher's exact test P = 0·020) than those reporting mild or no impairment. No other variations in symptom prevalence by degrees of impairment were observed.

Psychosocial impairment, symptom score and episode duration in MDE

The number of DSM-III-R symptoms was normally distributed (Shapiro–Wilk P = 0·26) and ranged between 3 and 8, mean 5·2 (S.D. 1·50), median 5·0. In addition to the association

with severe psychosocial impairment (see below) there were trends of female gender (5·4 *v.* 4·7) ($t = -1·912$, df = 66, $P = 0·060$), frequent drunkenness (5·9 *v.* 5·0) ($t = 1·706$, df = 66, $P = 0·093$), being without a stable relationship (6·1 *v.* 5·0) ($t = -1·857$, df = 66, $P = 0·068$) and allergic symptoms (5·9 *v.* 5·0) ($t = 1·83$, df = 66, $P = 0·071$) associating with a higher mean symptom score. No significant difference between age groups was observed (5·1 for young adults *v.* 5·3 for adolescents) ($t = 0·432$, df = 66, $P = 0·667$).

The length of the worst major depressive episode ranged from 2 weeks to 12 months. The distribution was highly skewed. Mean total episode duration was 1·5 months (s.d. 2·54) and median 1 month in both genders (Mann–Whitney *U*, $z = -0·890$, $P = 0·418$) and age groups (Mann–Whitney *U*, $z = -1·567$, $P = 0·117$). Most subjects with MDE ($N = 62$; 91·2%) reported that the episode had both started and ended during the 12-month period. No factors associating with median duration of MDE were found.

All but one subject with MDE reported psychosocial impairment: 27·9% ($N = 19$) reported severe impairment, and 50·0% ($N = 34$) moderate impairment while 20·6% ($N = 14$) perceived that MDE only had a small impact on their functioning. If severe psychosocial impairment was present the mean number of depressive symptoms was significantly higher (5·9, s.d. 1·82) than among those with mild or moderate (4·9, s.d. 1·27) impairment ($t = 2·232$, df = 25·1, $P = 0·035$). Drunkenness at least twice a month was related to a higher level of psychosocial impairment among those with MDE. While 14·7% ($N = 10$) the respondents with MDE reported drinking to drunkenness at least twice a month, 6·1% ($N = 3$) of those with mild or moderate impairment and 36·8% ($N = 7$) of those with severe impairment reported as frequent drunkenness (Fisher's exact test, $P = 0·004$). No other variables associating with increased psychosocial impairment in MDE were found.

DISCUSSION
Twelve-month prevalence of MDE
The 12-month prevalence of MDE in both age-groups fall into the range of estimates reported in prior studies using standardized diagnostic interviews and DSM criteria among adolescents and young adults. The MDE prevalence was lower than in the NCS, which applied UM-CIDI in case ascertainment, estimating the 12-month prevalence of MDD to be 12·4% among 15–24-year-olds (Kessler & Walters, 1998). Small alterations in the diagnostic algorithm can cause significant differences in prevalence estimates (Regier *et al.* 1998). Discrepancies may also be due to differences in sampling, study populations and their age distribution, information sources, data processing and presentation (Roberts *et al.* 1998) as well as to true variation in prevalences between populations (Weissman *et al.* 1996).

We also estimated the prevalence of MDE if 'at least moderate impairment' was reported by the respondent. Prevalences were lowered by 20–25%, replicating earlier findings that case definition is affected by including impairment criteria (Shaffer *et al.* 1996; Simonoff *et al.* 1997; Verhulst *et al.* 1997; Oldenhinkel *et al.* 1999). All but one subject reporting at least mild impairment is congruent with some earlier reports (Bird *et al.* 1988; Newman *et al.* 1996), while others suggest that many young people with MDD function relatively well (Shaffer *et al.* 1996; Verhulst *et al.* 1997). The marked variation in measuring and reporting psychosocial impairment makes comparisons between studies difficult. The UM-CIDI SF stem questions (Kessler *et al.* 1998*a*) may be rather exclusive resulting in lower sensitivity and misclassification of the mildest forms of depression.

Our finding that MDE was more prevalent among young adults than adolescents, agrees with higher prevalence estimates in studies including young adults rather than pure adolescent samples (Newman *et al.* 1996; Wittchen *et al.* 1998; Oldenhinkel *et al.* 1999). Longitudinal studies show a peak increase in depression after puberty while in young adulthood the high prevalence rates are mainly due to recurrent cases (Cohen *et al.* 1993; Lewinsohn *et al.* 1993; Newman *et al.* 1996; Oldenhinkel *et al.* 1999). Cross-sectional studies have been inconsistent, although many reports have not included age-specific data. Wittchen *et al.* (1998) observed the odds ratio for any affective disorder to be significantly higher in young adults (OR 1·98) compared with younger subjects, while in the NCS no age-gradient in prevalence of MDD

among 15–24-year-olds was found (Kessler & Walters, 1998).

Consistent with most prior studies females had an increased prevalence of MDE, although the female to male ratio was lower than expected. Finnish adolescent males may have an increased risk of MDE, which is indirectly supported by the high suicide rates among them (WHO, 1999). There is evidence on methodological determinants (e.g. threshold for caseness, interview instruments or measurement procedures), along with 'true' explanatory factors, to contribute to the sex difference measured in depression prevalence (Piccinelli & Wilkinson, 2000). Proxy interviews were more frequent among males and adolescents than females and young adults, and the true prevalence of MDE in adolescent males could be even higher than we found considering the possibility of non-participants having increased prevalence of psychiatric symptoms (Blazer *et al.* 1994).

The frequencies of MDE symptoms

Our study covered both genders and a wider age range than earlier epidemiological studies on the phenomenology of adolescent MDE. We found the phenomenology of MDE to be fairly consistent with the report from the Oregon Adolescent Depression Project (OADP) (Roberts *et al.* 1995). In both studies depressed mood (OADP 98%) and impaired concentration (OADP 82%) were among the three most prevalent symptoms and thoughts of death had the lowest prevalence (OADP 55%). Anhedonia was more prevalent in our sample (OADP 77%) and sleep disturbances (OADP 89%) and symptoms related to appetite (OADP 80%) were more common in OADP. Also, in the study by Goodyer & Cooper (1993) the symptom frequencies among the 15-16-year-old females closely resembled those observed by us, depressed mood (91%) and impaired concentration (71%) being the most prevalent symptoms. However, increased appetite was clearly more common (71%) and anhedonia among females less prevalent (14%) in their study.

The frequencies of depressive symptoms in our study fall into the range reported in clinical samples (Strober *et al.* 1981; Ryan *et al.* 1987; Carlson & Kashani, 1988; Mitchell *et al.* 1988).

Thoughts of death were an exception here, being less frequent in our sample, which is consistent with the study by Roberts *et al.* (1995). We also found worthlessness to be at the lower end of the range. Suicidal thoughts or behaviour being more frequent in clinical samples may indicate that suicidal adolescents are more likely to alert their significant others leading to increased rates of treatment referral. In our study the symptom prevalence of MDE was mainly independent of age and gender. Prior studies have also concluded that the core diagnostic symptoms of adolescents MDE are fairly consistent and similar to those in children and adults.

Impaired concentration associating with at least moderate impairment is understandable via the ability to concentrate in studying and working. We found no reports in adolescent general population samples on the relation of phenomenology and psychosocial impairment, with the exception of suicidality being linked to an unfavourable course of MDD (Lewinsohn *et al.* 1994). In our study, the prevalence of thoughts of death did not vary by degree of disability. Assessment of actual suicidality might better differentiate those with severe impairment, thoughts of death being more common than suicidal behaviour among depressed adolescents.

Characteristics of MDE

Regarding episode duration our study is congruent with most earlier findings in adolescent general population samples, although the median duration of MDE in our sample was at the lower end of the range observed before (Keller *et al.* 1988; Goodyer & Cooper, 1993; Lewinsohn *et al.* 1994). Clearly longer episodes have also been reported (Oldenhinkel *et al.* 1999; Olsson & von Knorring, 1999). UM-CIDI SF assesses the duration of the worst episode, and it is possible that periods of varying symptom severity or partial remission are not included by the respondent leading to a spuriously short estimate of the total episode duration. The time of the investigation may also have a censoring effect on episode duration although, in the present sample, the effect is likely to be quite small on a population level.

We were unable to analyse diagnostic substance use disorders, but of equal interest was that a certain drinking pattern among depressed

youth is related to severe impairment in the presence of MDE. Frequency of drunkenness has earlier been suggested to be 'the single best indicator of problem drinking among young adults' (Bailey *et al.* 1997). Also, in twin studies simple measures as the number of maximum drinks ever drunk have proven to be good proxy measures of DSM alcohol dependence criteria (Saccone *et al.* 2000).

Cut points of mild or moderate impairment not yielding any factors differentiating those with impairment from those without may be due to the characteristics of the interview instrument. Kessler *et al.* (1998*b*) suggested that if respondents are asked a 'yes–no' question more report significant distress than if categories such as 'a lot, moderate, some, not at all' are used. Interpretation of these 'vague quantifiers' may vary greatly by respondent in a general population survey and lay interviewers are not expected to use clinical judgement in rating.

Strengths and limitations

Few studies on adolescent psychiatric disorders, including MDE, have been carried out on a highly representative, nationwide sample. The size of our sample is also among the largest of epidemiological studies in adolescents still not large enough for some subgroup analyses. Although an ideal way to explore developmental patterns in psychopathology would be a longitudinal design, we were able to study two developmentally different age-groups, i.e. adolescents and young adults. In particular, the phenomenology of adolescent MDE in general populations and episode characteristics has not been sufficiently covered by earlier literature. We were also able to assess one of the most common mental health disorders in adolescence in the context of other health-related issues.

Our study has the general limitations of a cross-sectional design. Most importantly, causal inferences cannot be made. Another limitation was the inability to assess psychiatric co-morbidity. Thirdly, since UM-CIDI Short-Form does not allow assessment of subthreshold conditions, we could not analyse subjects with depressive symptoms neither did we have a non-depressed control group for further analyses on the phenomenology of MDE. Finally, lacking information on the history of earlier depressive

episodes or other mood disorders (e.g. bipolar or schizoaffective disorder) is a limitation.

Although the procedural validity of CIDI is good, the validity of UM-CIDI SF in general population samples (Kessler *et al.* 1998*a*) or samples outside the NCS (Patten *et al.* 1997) has been studied less. It has been suggested that UM-CIDI SF could be of high specificity and slightly lesser sensitivity when compared with full CIDI (Kessler *et al.* 1998*a*). Additionally, in comparison with full UM-CIDI, the stem questions in the Short-Form are more detailed in their requirement for the intensity of depressed mood and/or anhedonia and all but four subjects endorsing the stem questions also received the MDE diagnosis. A higher threshold for stem question endorsement as well as lower sensitivity and a possible tendency of UM-CIDI to over-estimate the prevalence of major depression (Kessler *et al.* 1998*b*) may yield lower prevalence estimates for MDE and lower associations when compared e.g. with the results from the NCS.

Clinical implications

MDE is common among adolescents and young adults, with females and young adults affected more often than males and adolescents. Although episodes of major depression in the general population of both adolescents and young adults are as short as a few weeks they are likely to be accompanied by impairment. Both psychosocial impairment and number of depressive symptoms could serve as measures of severity of major depression.

It seems that the phenomenology of adolescent MDE in a general population sample does not greatly vary by age, gender or levels of impairment. Females are more affected by symptoms related to appetite than males. Concentration problems implicate more severe psychosocial impairment and specific assessment of difficulties in concentration may help evaluate the impact of depression on school or work. Our study underlines the importance of identifying drinking patterns among adolescents and young adults in clinical practice. Screening for the frequency of drunkenness in a depressed adolescent, or for depression in those frequently drinking to drunkenness, may help to identify multiple problem areas and targets for early intervention.

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