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Adolescent Depression

Epidemiology, Nosology, Life Stress and Social Network
Minireview based on a doctoral thesis

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ABSTRACT

The study engaged a total population of 16-17-year-old urban high-school students and 2300 (93%) were screened for depression and previous suicide attempts. Adolescents with high depression scores in self-evaluation (12.3%) or reporting previous suicide attempts (2.4%) were diagnostically interviewed together with one control for each, matched for gender and educational program. After the interview self-ratings were completed regarding social network, family climate, and life events.

Major depression was prevalent during the last year in 5.8% and during life time in 11.4%, 4 girls for every boy. A depression with remaining symptoms for a year or more was the most common type. Dysthymia without major depressive episodes was diagnosed in 1.1%, two girls for every boy. Short hypomanic episodes had been experienced by 13.2% of those with major depressive disorder.

Anxiety disorder was comorbid to depression in one half and conduct disorder in one forth of the depressed adolescents. Alcohol was abused by 6.5% and used regularly by another 12%. Other drugs were used by 6.5% of depressed adolescents and not at all by controls. The depressed used tobacco twice as frequently as non-depressed.

Social network and family climate were compared within the originally matched pairs. Adolescents with long-lasting depressions had a smaller and unsatisfying social network. They also had experienced many stressful life events related to family adversities, while those with shorter depressive episodes had stress related to the peer group. Depressed adolescents with comorbid conduct disorder reported insufficient support from the close network and a more negative family climate.

Keywords: Adolescent, depression, epidemiology, social network, family, life events.

BACKGROUND

History

Childhood depression was described in the 19th century by several psychiatrists e.g. Emminghaus (1887). Depression in a child was later on considered not possible because of the immature personality structure (Rie -66). In the following period it was thought that adult-like depression could be experienced in childhood but was expressed in a different way. This was described as "masked depression" (Glaser -67, Cytryn -72). The first attempts to make a classification of depression in children were made in the 70's. The criteria were based on similarities with adult depression as well as on features related to developmental level (Malmquist -71, McConville -73, Weinberg -73). The diagnostic operational criteria for depression in adults were finally accepted also for children and adolescents in DSM-III (APA 80).

The criteria were tested in children and adolescents with good results (Carlson -79), but there was still a discussion if not the age specific features had to be applicated (Carlson -86). Depressed mood, suicidal ideation, diminished concentration and insomnia were found to be equally frequent in depression across all ages, but anhedonia, diurnal variation, psychomotor retardation and delusions increased with age (Carlson -88b). From the 80's depression in children and adolescents have been regarded as the same affective disorder as in adults (Cytryn -80, Angold -88, Rutter -88). Very strong arguments for this came from longitudinal and hereditary studies: children with depressive disorder had an increased risk for depressions in adult ages (Harrington -90) and children of depressed parents had a greater risk for major depression (McKnew -79, Orvaschel -80, Weissman -87b). The DSM criteria for major depression were thus regarded as appropriate for adolescents (Roberts -95b).

Studies of children and adolescents

Age and gender differences

Epidemiological studies of depression in children had a start in the Isle of White study in the 60´s. The prevalence of depressive symptoms were shown to increase from the first investigation at 10-11 years of age to the follow up at 14-15 years (Rutter -89). In later investigations this increase with age was found more pronounced in girls. (Fleming -89, -90, McGee -92a, Kessler -94a, Lewinsohn -94c). The increase occurred at the age of 13-15 years (Anderson -87, McGee -92a) and was then proved to be best related to physical puberty (Patton -96, Angold -98). In adolescent years the frequency of depression is found at least twice as high in girls as in boys (Angold -93a, Fergusson -93a), the same proportion as in adults (Weissman -93a). Middle to late adolescence is a preferable age to study the vulnerability to depression (Hankin -98).

Girls in late childhood and early adolescence are more prone to anxious and depressive symptoms and boys to acting out (Ostrov -89). Puberty as well as psychosocial factors seem to influence the gender difference (Brookes-Gunn -89, Nolen-Hoeksema -94). Girls of this age have a more negative body-image and lower self-esteem than boys (Allgood-Merten -90). In the early teens, when adolescents start to live more separate from the family, the social network is changing and there might be a decrease in protective factors (Larson -91).

Secular increase

A secular increase of depression in young ages has been found in several analyses of epidemiological studies (Klerman -88, Burke -91, Ryan -92, Kessler -98). This is due to increasing rates as well as an earlier age of onset in successive cohorts (Klerman -85, Gershon -87, Joyce -90, Lavori -87, -93, Lewinsohn -93b). The increase is found both in North America, Europe and Australia (Klerman -89). The increasing life-time prevalence of depression has not changed the gender differences (Kessler -94a).

Parental awareness

The parents are not very often aware of depressive symptoms in their children. The prevalence of depression becomes lower when the parents are interviewed than when the children themselves are (Herjanic -82, Edelbrock -86, Angold -87, Weissman -87a, Barret -91). The highest depression rates are reached when information from child and parent are used in an additive way (Bird -92). Collecting information from both and using decision rules specified in the taxonomic system is recommended (Costello -89a, Andrews -93). Another study found that a parent's perception of the child's depression is related to the parent's own depression and interviews of children and adolescents themselves are recommended (Moretti -85). Depressed mothers even overrate their children's symptoms (Breslau -88, Fergusson -93c, Renouf -94). The parent-child congruence is better in rating externalising than internalising symptoms (Cantwell -97). The recall is better for depression than for anxiety (Fendrich -91).

Screening

Screening for depression among adolescents in the community has been done with different questionnaires. The Beck Depression Inventory, BDI, used with the adult cut off for moderate depression has resulted in prevalences of around 10% (Hammen -77, Kaplan -84, Baron -86, Barrera -88, Larsson -90, Ehrenberg -90, Roberts -91) and for severe depression of around 4% (Teri -82, Roberts -91). For younger children the Children's Depression Inventory, CDI, has been widely used (Kovacs -83, Costello -88, Fudundis -91). The Center for Epidmiologic Studies Depression scale, CES-D, could be used in adolescents, but almost half of adolescents reach the adult score for moderate depression. A higher cut off score has to be used to delimit around 10% as depressed (Roberts -91). Birleson's Depression Self-Rating Scale, DSRS, developed for children is another instrument with good screening properties (Birleson -81, -87, Costello -88, Fudundis -91). It has been used in Swedish adolescents with the suggested cut off score resulting in 7% with suspect depression (Ivarson -97). The Mood and Feelings Questionnaire, MFQ, (Costello -88) has been used in patients (Wood -95, Goodyer -97a, Kent -97) but not yet for screening of adolescent general population.

Nosology and epidemiology

Major depression

According to DSM-III interviews major depression has been diagnosed in 1-3% among pre-adolescent children from general populations (Kashani -83, McGee -88, Bird -88). With a two-stage design, questionnaire and interview, the prevalence has been below 1% (Fleming -89). Even in pre-schoolers major depression is found in one percent (Kashani -87b). In studies where the puberty ages are included, that is childhood years and the lower teens, the prevalence of depression has been around 2% (Fleming -89, McGee -90, Cohen -93, Canals -95) except in one study where it was 9% (Garrison -92). When high-school students in the upper teens have been interviewed the point prevalence has been 2-5% (Kashani -87a, Bailly -92, Lewinsohn -93c, Cohen -93, Roberts -95b, Canals -97), the last-year prevalence 4-6% (Fergusson -93a, Cooper -93) and the last-year incidence 3-5% (Lewinsohn -93c, Garrison -97). This is similar to adult point prevalences that are close to 5% (Blazer -94). The life-time prevalence at 18 years of age in a large longitudinal study was 9.4% (Reinherz -93a) and in a cluster of 15-24 year olds 15.7% (Blazer -94). In the Los Angeles Epidemiologic Catchment Area project one fourth of the adults with major depression reported onset of their first episode before 18 years (Sorensen -91). Among British child psychiatry patients 23-35% were found to have significant depression (Pearce -78, Kolvin -91) and among Swedish child psychiatry inpatients 27% (von Knorring -88).

The mean and median length of the first major depression episode in young patients is 8-9 months (McCauley -93, Kovacs -97b). The recovery by one year is around 80% and by two years 90% (Keller -88, -Strober -93, Kovacs -97b), which is faster than in adults (Kovacs -96). The social function seems to decline with the duration of the major depression (Ferro -94) and the social function at the start of treatment is the strongest predictor for the outcome (King -97). The recurrence of major depression episodes in adolescence is high both in clinical studies (Garber -88, Harrington -90, Rao -95, Orvaschel -95, Emslie -97) and in

studies of school populations (Lewinsohn -94c). Within 3 years 50% have a new depression episode (McCauley -93). Adolescents with depression get a worse function as young adults (Devine -94).

Childhood depression often starts as a dysthymia and the first major depression episode appears in adolescence (Kovacs -84a). Depressive problems tend to persist into young adulthood and should not be regarded the norm (Feehan -95, Ferdinand -95b, Lewinsohn -94b). Early onset of depression is related to longer episodes (Warner -92, Lewinsohn -94c), remaining subsyndromal symptoms (Rohde -94) a decrease in global functioning (Rao -95), a reduced ability to establish intimate relationships (Kandel -86) and a lower frequency of marriage and parenthood (McGlashan -89). Both major depression and dysthymia in early ages are related to a higher frequency of personality disorder in adulthood (Fava -96, Riso -96). Like the adult depression the adolescent depression has a relation to borderline personality disorder (Kutcher -90) and also to other personality disorders (Ekselius -98).

Dysthymia

Dysthymia is comorbid to major depression in 10% of depressed adolescents and often precedes the onset of major depression (Kovacs -94, Lewinsohn -91). Dysthymia has an earlier onset than major depression and the course is protracted (Kovacs -84a). In 70% of the cases it develops into a major depression later on. Childhood dysthymia can be regarded as an early marker or a subsyndromal form of major depression (Kovacs -94, Anderson -96). Relatives of children with this early onset dysthymia have almost the same high frequency of major depression as relatives of probands with early onset episodic major depression (Klein -88, -95). In a literature overview no sufficient evidence was found for dysthymia and major depression to be different disorders (Hirschfeld -94). In most studies of adolescents a little lower prevalence of dysthymia than of major depression is found, mostly 1-3% (Kashani -87c, Garrison -92, McGee -92a, Fergusson -93a, Lewinsohn -93c, Canals 95, -97).

Double depression

The definition of double depression is a major depression episode occurring in a dysthymia state (Keller -82). This is a common diagnosis among adolescents and is to be regarded as a major depression over a long time with a fluctuation of the symptom level (Kovacs -94). Adults with double depression had an earlier onset of depression than those with episodes of major depression (Sorensen -91). Double depression has a bad prognosis in adults (Keller -82). In adolescents it has a severe and protracted course with a high rate of comorbid diagnoses. The risk for recurrence is higher when a dysthymic state remains after the episode of major depression (Kovacs -84b). The social impairment is worse than for either of the depression diagnoses alone and suicidal acts are more common (Lewinsohn -91, Kovacs 94, Ferro -94). This chronic form of depression has a slow rate of improvement also when treated in hospital (Shain -91).

Bipolar disorder

Manic episodes frequently develop in children and adolescents with major depression. Within five years 20-40% of the adolescents with major depression will have an episode of mania or hypomania (Strober -82, Geller -94, Rao -95). Among adults with bipolar disorder 30% had their first manic-hypomanic episode already in adolescence and the peak onset came in early adulthood (Loranger -78, Joyce -84). The risk for bipolarity is greater when depression has a very early onset (Kovacs -96) and when the childhood depression has psychotic symptoms (Haley -88, Strober -93). It has also been suggested that young people are more prone to psychotic symptoms during a depression (Ballenger -82, Chambers -82, Rosen -83, Joyce -84). Rapid cycling cases have been described in childhood (Jones -87) and bipolar adolescents have a higher rate of mixed episodes than adults (McElroy -97). Young people with mixed or cycling episodes have multiple relapses with new episodes (Strober -95).

In a general high school population bipolar disorder is found in around 1% and it is related to high rates of comorbidity and to functional impairment (Lewinsohn -95a). Even hypomanic traits are associated with psychosocial dysfunction, mood

disorder, disruptive behaviour and substance use (Klein -96). Early onset bipolar inpatients have a poor prognosis with many readmissions to inpatient care (Thomsen -92). From a good premorbid function a general deterioration of school achievements and peer relationship is seen after the onset of a bipolar disorder in adolescence (Quackenbusch -96). Other studies have found that the prognosis does not become worse from the occurrence of mania (Carlson -77, McGlashan -88).

Non-referred adolescents with manic symptoms have high rates of attention deficit, conduct and anxiety disorders as well as psychotic symptoms (Carlson -88a, West -95). Prepubertal bipolar disorder have features of both ADHD and conduct disorder (Geller -97). The diagnosis of a manic episode could be difficult when ADHD is present from childhood (Bowring -92). The outcome of this combination is discouraging with a great risk for substance abuse and antisocial behaviour (Carlson -90). More than half of the early bipolar patients have conduct disorder and this group has a worse clinical course than the bipolar group without conduct disorder (Kovacs -95). Behavioural problems and conduct disorder have also been discussed as predicting bipolar outcome in affective disorder (Kutcher -89b, Carlson -93).

Suicidal behaviour

Suicidal ideation and attempts are strongly related to depression in adolescents (Brent -86, Kashani -89a, Garrison -91a, de Man -92, Juon -94, Cappelli -95, Roberts -95a). Suicidality has the same psychosocial risk factors as depression (Lewinsohn -94a). Before 16 years of age 3% of adolescents in a cohort study had made suicide attempts (Fergusson -95c). Dutch 14-20 year-old girls reported suicide attempts in 3.3% and boys in 1.3% (Kienhorst -90a). Among American older adolescents 7.1% had made attempts (Andrews -92). In a longitudinal study the early onset of psychiatric disorder was found to increase the risk for suicidal ideation and attempts in late adolescence (Reinherz -95). The risk for suicidal behaviour is high for adolescents with early onset and long duration of depression (Ryan -87, Brent -90). In longitudinal studies of adolescent suicide attempters the

suicidal mortality is 4-6% within 5-10 years (Kotila -92, Rao -93, Harrington -94, Granboulan -95). Suicidal behaviour in the family increases the risk (Harkavy-Friedman -87, Pfeffer -94). A previous suicide attempt is in itself the strongest predictor for a future attempt (Myers -91b, Lewinsohn -94a, Pearce -94).

Comorbid substance abuse and conduct disorder increase the risk for suicide attempts (Pfeffer -91, Myers -91a, Andrews -92, Kovacs -93, Brent -94b, Harrington -94). The combination of depression and substance abuse is found in studies of suicide attempters both among psychiatric patients (Garfinkel -82, Robbins -85, Brent -93a) and in school populations (Kienhorst -90b, Andrews -92, Rossow -84, de Man -95, Windle -97). A 20-year increase of suicide attempts among British adolescent boys was found to have a strong association with an increase of alcohol abuse (Fombonne -98). Adjustment or conduct disorder comorbid to depression are also frequently found in adolescent suicide attempters in studies both of patients (Borst -89, -91, King -90, Kerfoot -88, -96) and school populations (Trautman -91, Andrews -92), as well as in a cohort study (Fergusson -95b). High school and clinical populations with suicidal ideation report the same comorbidity of depression with substance abuse and disruptive behaviour (Choquet -89, Levy -89, Kandel -91, Swanson -92). Poor social adjustment and mood disorder are strong risk factors for a repeated attempt (Kotila -87, Pfeffer -93).

Comorbidity

Psychiatric disorders

Comorbid psychiatric disorders are even more common in adolescent than in adult depression (Rohde -91, Kovacs -96, Hinden -97). An earlier age of onset is related to greater comorbidiy (Giaconia -94, Kasch -96) and comorbidity is associated with greater impairment (Bird -93). The frequency of comorbid diagnoses are high both in clinical studies (Biederman -95, Puig-Antich -86) and community studies (Bird -93, Rohde -91). In some clinical studies it is as high as

around 90% (Alpert -94, Goodyer -97a). The different depressive diagnoses major depression, dysthymia and double depression have the same high level of comorbidity (Lewinsohn -91).

Major depression most commonly occur after the onset of other childhood psychiatric disorders, mostly anxiety or disruptive disorder (Kovacs -89, Reinherz -93a, Biederman -95). Disruptive behaviour and substance abuse are more frequent in boys and anxiety in girls (Lewinsohn -95b). Comorbidity is associated with a slower recovery (Keller -88, Goodyer -97a) and a higher tendency for the depression to persist through adolescence (Feehan -93, Ferdinand -95a). Adolescents with severe comorbid diagnoses often turn out to have personality disorders as adults (Kreuger -96).

An overview of epidemiologic studies shows a relatively wide frequency range for different comorbid disorders: anxiety disorder 30-75%, conduct disorder or oppositional defiant disorder 21-83%, and attention deficit disorder 0-57% (Angold -93b).

Conduct disorder

Disturbed behaviour fulfilling criteria for conduct disorder is common and found in one fifth to one third of depressed adolescents (Marriage -86, Kutcher -89b, Biederman -95) and depression is common among conduct disordered as well (Zoccolillo -92, Myers -93). Depressed adolescents with conduct disorder tend to have a greater variability in their mood during the day and between days (Costello -91). Conduct disorder is especially common in bipolar affective disorder (Kutcher -89b, Kovacs -95). The same pattern of depression in combination with conduct disorder is found in school populations and in patient groups (Kashani -87c, Puig-Antich -82). More than two thirds of this comorbidity can be explained by common environmental risk factors, not by one disorder leading to the other (Fergusson -96a).

Even if conduct disorder could develop as a complication of depression it seems to persist after the depression has remitted (Kovacs -88). Many characteristics are the same as in pure conduct disorder and it could be regarded as a subgroup of conduct disorder (Steinhausen -96). It is associated with lower social competence (Biederman -97b, Renouf -97). The short-term outcome becomes worse with a risk of developing antisocial personality disorder (Harrington -91, Biederman -97b) and substance abuse (Fleming -93, King -96). The outcome tends to be more similar to the outcome of conduct disorder than to the outcome of depression (Fleming -93). Because of those special traits depression with conduct disorder has been proposed to be a special nosologic entity (Harrington -91, Fleming -93, Birmaher -96) and is a separate diagnosis in ICD-10 (WHO -96).

Attention deficit hyperactivity disorder

ADHD might be difficult to differentiate from affective disorders and it is crucial to scrutinise the onset conditions (Bowring -92, Weller -95). In half of the cases ADHD is combined with other conduct disorders or emotional disorders (Livingston -90). ADHD may lead to both affective disorder and early onset of oppositional and conduct disorders (Munir -87, Biederman -87, -91a, Rey -94, Loeber -95). ADHD and conduct disorder are distinct disorders even if they are often comorbid (Szatmari -89, Jensen -97). Children with ADHD also have an increased risk for bipolar disorder (Biederman -96) and ADHD may even be the signal of an early bipolar disorder (Faraone -97b). A hypothesis that attention deficit and affective disorder share familial risk factors is supported in a family study (Biederman -91b, Faraone -97a). In a follow-up study the combination was seen as mainly reflecting the depressive disorder heredity (Biederman -98). Among children with ADHD and anxiety or depression the parents themselves have more life stress and mental symptoms (Jensen -93).

Anxiety disorders

In community studies anxiety disorders have been found in 17% of adolescents (Kashani -88b) and 14% of children (Keller -92b). More than 40% of adolescents with major depression have a concurrent child anxiety disorder (Kovacs -89,

Mitchell -88, Geller -85) and they are likely to have more than one anxiety diagnosis (Last -92, Strauss -88a). Anxiety disorder often has preceded major depression in investigations of both adolescents and adults (Brady -92, Reinherz -89, -93a, Alpert -94, Kessler -96). Adolescents and young adults with the combination of anxiety and depression have a more severe symptomatology than those with either diagnosis in a pure form (Brady -92, McCauley -93, Bernstein -91a, Strauss -88a, Angst -85). In a prospective study they had more impairment as young adults than those with anxiety alone (Last -97). When the emotional psychopathology is severe, depression and anxiety diagnoses can be better separated than in milder cases (Gurley -96). General anxiety and depression seem to share genetic factors (Bernstein -89, Roy -95). Anxiety symptoms in three age cohorts show a decrease with age while depressive symptoms increase in girls but not clearly in boys (Kashani -89c).

Separation anxiety is the most common form of anxiety before puberty (Kovacs -89, Kashani -90b). Children with separation anxiety have a high risk of developing affective disorder later in life (Puig-Antich -86). Overanxious disorder is more common among adolescents and often combined with depression (Strauss -88b, Bernstein -91b, Kashani -90b), but the validity of this overanxious diagnosis has been questioned because it is too unspecific (Beidel -91, Werry -91). Avoidant disorder has some overlap with social phobia and is very often comorbid with overanxious disorder (Bernstein -91b). Simple phobias of clinical, subsyndromal and subthreshold level are found in 2.3%, 14.5% and 22.2% respectively among depressed adolescents (Milne -95). In a general adolescent population phobias of some importance are diagnosed in 3.6% (McGee -90). School phobia has an overlap with both affective and anxiety disorders (Bernstein -86).

Panic disorder has been found in 0.6% of adolescents (Whitaker -90). Attacks commonly start during adolescence (Last -89a, McCauley -89), but have been described already in younger children (Alessi -88, Moreau -89, -92). The increase is related to puberty stage (Hayward -92). In adults panic disorder is

common in affective disorder, especially in bipolar disorder (Leckman -83, Chen -95). It is related to slower recovery (Coryell -88) increased risk for alcohol abuse (Hirschfeld -96) and suicidal behaviour (Johnson -90, Warshaw -95). When panic disorder in adults is combined with depression, the panic attacks are more frequent (Pini -94) and the depressive disorder seems to be more severe and depressive episodes more protracted (Coryell -88). The social function is worse than if panic disorder is pure (Vasile -97). Panic disorder is of genetic nature and is frequently found in first degree relatives (Weissman -93b,c, McGuffin -94), especially when the attacks have an early onset (Goldstein -94, -97). In a study of hospitalised adolescents with panic disorder nine of ten had a depressive disorder as well (Alessi -87). Besides depression panic attacks in adolescence are also often combined with other anxiety disorders, conduct problems and alcohol use (Biederman -97a, Hayward -97).

Obsessive-compulsive disorder

OCD has been found in 1-3% of young adolescents and subclinical symptoms in 19% (Flament -88, Valleni-Basile -94). Among 18 year-olds a one-year prevalence of 4% has been registered (Douglass -95). In these two studies OCD was comorbid with depression in 74% and 62% respectively. In another study of referred children and adolescents with obsessive-compulsive disorder 29% had mood disorder (Riddle -90). Symptoms have mostly started at the age of ten to twelve years among referred as well as non-patient adolescents (Last -89b, Riddle -90).

Post-traumatic stress disorder

PTSD reached a life-time prevalence of 6.3% by the age of 18 years in a longitudinal study of a community population (Giaconia -95). These adolescents had widespread psychosocial impairment and an increased risk for additional disorders including depression. In a study of adults, women had a higher prevalence of PTSD than men, irrespective of trauma frequency. It seemed that the susceptibility was highest for trauma before 15 years of age (Breslau -97). Childhood trauma also had led to this gender difference in Cambodian young

adults and was often comorbid to depression or anxiety (Hubbard -95). An adolescent study confirmed the gender difference with a prevalence of 3% among girls and 1% among boys, but in this study the girls had experienced more traumas. The risk for PTSD was high after rape, sexual abuse, serious accidents and medical emergencies (Cuffe -98). In abused children the PTSD was related to anxiety, ADHD, brief psychotic symptoms, suicidal ideation and a trend to mood disorder (Famularo -96).

Substance abuse

Nicotine dependence and depression seem to have a common risk factor (Fergusson 96d). Major depression predicts tobacco smoking and smoking increases the risk of major depression (Brown -96, Breslau -98). Smoking also increases the risk of use of alcohol and illicit drugs (Breslau -95). Tobacco smoking seems to be the entry to all other forms of abuse. It is a specific risk factor for abuse but not for depression (Lewinsohn -95c).

Depression is the only significant mediator between stress and alcohol use. Impulsive adolescents drink more heavily than other depressed adolescents (Hussong -94). Depression, but not conduct problems, in preadolescent boys was found to predict multiple drug use in adolescence (Henry -93). The opposite, preadolescent conduct disorder but not emotional disorder, predicted drug use in another study (Boyle -93a). Progression to illicit drugs is dependent on use of alcohol (Kandel -92). In most studies of adolescents the abuse of alcohol and other substances has been associated with both depressive disorders and disruptive behaviour (Deykin -87, Greenbaum -91, Rohde -96, King -96, Clark -97). These studies found that depression preceded the abuse, but other studies have found that the depression is secondary to abuse (Biederman -95, Hovens -94, Bukstein -92).

In four fifths of the cases the abuse of alcohol or drugs has started before 18 years of age (Kashani -87d). In adolescents with conduct disorder and abuse the depression is concomitant especially in girls (Grilo -96, Whitmore -97, Kandel

-97). Adolescent alcohol abuse has a stronger relation to depression in girls than boys (Clark -97) and depression is the primary variable related to abuse in girls (Whitmore -97). Substance abuse is also related to persistence of depression (Kashani -85, Sanford -95). After a remission of abuse the adolescents are likely to have another psychiatric diagnosis (Keller -92a).

Somatic problems

Several somatic complaints are common in adolescents with depression (Larsson -91, Campo -94) even if it is still more common in pre-adolescent children (Carlson -88b). Depression is a significant problem in an adolescent health clinic (Cappelli -95). Somatic complaints are the most common reason for adolescents to seek help when they are depressed (Gasquet -97). Among depressive patients different somatic complaints are found in 70% and in patients with other psychiatric disorders in 34% (McCauley -91). Physical symptoms are related to depression, but not to comorbid disorders. Symptoms increase with the severity of depression regardless of coexisting anxiety (Lewinsohn -95b). In school refusers somatic complaints are commonly an expression of anxiety and depression (Bernstein -97).

One third of paediatric patients with a headache, which is the most common symptom, have depressive features (Lewis -96). Adolescents with a chronic daily headache have a diagnosis of depression in 86% (Kaiser -92). Headache is twice as common in depressed as in non-depressed adolescents and major depression leads to a nearly tenfold increased risk of developing headache (Pine -96). In childhood recurrent abdominal pain without identifiable organic cause anxiety and depression is present in most of the cases (Garber -90). Adolescents with irritable bowel syndrome score high on anxiety and depression (Hyams -96). Depression increases the risk for a disease with functional impairment and vice versa (Lewinsohn -96).

Etiology

Genetic factors

Many studies have indicated genetic factors for depression. Parental depression is related to a higher frequency of depression in the children (Weissman -87b, Orvaschel -88, Lavori -88, Merikangas -88, Beardsley -88, Kovacs -97a). Especially the rates of prepubertal depression is increased (Weissman -97). Mood disorder in relatives is more common when the onset of the depression occurred already in childhood or adolescence (Puig-Antich -89, Orvaschel -90, Strober -92, Todd -93, Williamsson -95b). Relatives of depressed children also had their first depression earlier in life than relatives of adults with later depression onset (Todd -93, Neuman -97, Kovacs -97a). In one twin study heredity was the important factor for depressive symptoms in adolescence but shared environmental factors in earlier childhood (Thapar -94). Another twin study found non-shared environmental factors to be most important factor (Eley -98).

Depression rates are higher in female than in male relatives of depressed children (Harrington -93). Mothers of depressed adolescents have more depression, anxiety, alcohol and drug abuse and suicidality. Fathers have more substance abuse and antisocial pathology (Mitchell -89). Alcoholism is 2-3 times as common in relatives of children with major depression as in the relatives of controls (Todd -96b).

Children of bipolar parents have a high rate of affective disorder and disruptive behaviour (Cytryn -82). They more often have attention deficit and behaviour problems in childhood, mood disorder as young adults (Carlson -93)) and an early onset of bipolarity (Todd -96a). Bipolar affective disorder in adolescents is more common when there is a high loading of mood disorder, especially of bipolar disorder, in the family (Rice -87, Geller -94, Akiskal -95). Bipolarity is more frequent in the first degree relatives of adolescent bipolar patients than in the relatives of adult bipolar patients (Strober -88, Kutcher -91). With a high

familial loading, bipolar disorder should be suspected even in subsyndromal depressions in the children (Nottelmann -95).

In milder depressive disorders this genetic component has not always been possible to prove (von Knorring -83, Cadoret -85, Eley -98). Psychosocial adversities and stressors might play a greater role in those cases (Harris -85). Children of parents with early onset depressive disorder have an increased risk of both depression and anxiety disorder (Warner -95). Siblings at high risk for depression more often have an anxiety disorder than a depressive disorder in common (Rende -95). Disposition for anxiety and depression seem to have a common genetic factor (Kendler -86a, Roy -95). A genetic study of this comorbidity suggests that most of the covariation can be explained by a common set of genes (Thapar -97).

Genes in combination with environment

Children of affectively ill parents have a greater risk for affective disorder (von Knorring -83, Beardslee -93). Genetic factors, though, can never explain more than half of the variance in major depression. There is often a combination of a family history with affective disorder and adverse environmental factors (Kendler -86b, Canino -90). Low education, low social standards and poor economy are associated with a high frequency of depression and suicide attempts (Gore -92, Lewis -88). Parental alcohol problems increase the risk for psychiatric disorders in adolescents (Lynsky -94).

Both genetic and environmental factors play a significant role for depression in children (McGuffin -88, Rutter -90) and there seems to be an interaction between the two (Lavori -88, Brooks-Gunn -89, Plomin -94, -95, Nolen-Hoeksema -94). Individuals at high genetic risk appear to be more sensitive to the effects of adverse environment (Kendler -95). Distress and depression in the parents, poor confiding relations, family adversities and undesirable life events are all frequent among children with emotional disorders (Goodyer -88, -91a, -93c).

Social risk factors are better related to externalising than to internalising disorder in children (Velez -89). The highest risk for emotional or behavioural disorder is found in families high levels of hostile behaviour and parental personality disorders (Rutter -84). If depressed adolescents have a comorbid conduct disorder they have an increased rate of first degree relatives with antisocial personality disorder (Williamson -95b).

Puig-Antich (-89) proposed a nosologic continuum with adverse family and environment factors related to depression with comorbid conduct disorder at the one end and heredity and bipolarity at the other. On the other hand manic episodes at an early age is also related to conduct disorder (Kovacs -95). The early onset compared to later onset of affective disorder is related to a higher rate of affective disorder in relatives (Klein -95, Rende -97). When groups of prepubertal and adolescent depression were compared the familial rates of depression did not differ between them. The younger children instead had more family discord and higher rates of criminality among relatives (Harrington -97).

The parent-child relations

Depression in a parent influences the relations negatively (Orvaschel -80, Billings -83, Gordon -89, Hammen -90a). Parental depression increases the risk for both emotional and behavioural symptoms in the children (Billings -86, Hammen -87, Kashani -87e, Mitchell -89, Fendrich -90b, Fergusson -93b, Rende -93, Pike -96). The children of parents with depressive disorder have more adjustment problems (Downey -90) and also more neonatal and medical problems (Weissman -86). The more time the parent has been ill the greater the risk is of disorder in the adolescent (Beardslee -96). The more severe and chronic the parental disorder is the more impaired is the child (Keller -86). When the mother is the only parent the absence of the father has no direct effect on the risk for depression in the child, but acts indirectly by increasing the strain on the mother (Jensen -89). Children more easily get a depression from their own life stress if the mother is depressed (Hammen -91).

Unipolar depressed mothers have a more negative and less task-focused behaviour towards their children (Gordon -89). Their children have a worse psychosocial function than the children of bipolar mothers (Anderson -93). They more often have a chronic or intermittent depression (Hammen -90b). Psychopathology in children is more strongly associated with depression in the mother than in the father (Rice -84, Keller -86, Lavori -88) but this difference was not found for bipolar parents (Kato -96). Psychiatric disorders in mothers are related to depression in daughters, but daughters of depressed mothers have a depressive disorder only in the presence of negative social and family factors (Fergusson -95a). These girls often report maternal neglect and paternal physical and sexual abuse (Andrews -90).

Parental bonding plays an important role for adolescent psychopathology. In one study this was not specific for depression (Burbach -89). In another study depressed adolescents had a less secure attachment to their parents than adolescents with other psychiatric disorders (Armsden -90). When mothers suffer from affective disorder the children more often have an insecure attachment and tend to develop both depressive and disruptive problems (Radke-Yarrow -85, -92). Negative attachment is related to depression, substance abuse, eating disorder and personality disorder (Burge -97). Lack of perceived parental care and support is highly related to depressive symptoms in adolescence (Rey -95, Patten -97) and also to substance abuse and externalising behaviour (Barrera -93). Disruptions and adversity in parental care during childhood was found to four fold increase the risk for major depression in adulthood in women (Harris -86, Bifulco -87, Oakley-Brown -95a,b, Veijola -98).

The family

Family adversity and difficulties for the adolescents to perceive their own role within the family predict adolescent depression in longitudinal studies (Reinherz -93b, Fergusson -95a). Dysfunction in the family and distress or psychopathology in the parents are related to distress and depression in the children (Holahan -87, Jensen -90, Keitner -90, Monck -94, Tamplin -98). Problems with family

cohesion and adaptability (Reinherz -89, Garrison -90, Miller -92, Kashani -95b) and family conflicts and aggression (Kashani -88a, Fleming -90) are of importance. A parental attitude of rejection and firm control is associated with child depression and problematic behaviour (Baron -89). Family dysfunction and poor relations between the mother and her partner is related to the persistence of emotional disorder (Offord -92, Goodyer -97b). Depressed adolescents perceive their relations to parents difficult and less intimate (Puig-Antich -93, Lasko -96) and so do conduct disordered adolescents (Rey -90).

Family conflicts are disturbing the psychosocial adjustment of the children leading to both emotional and conduct disorders (Enos -86, Asarnow -90, Neighbors -97). These children have met more criticism and a lack of warmth from their mothers (Vostanis -94). A high level of expressed emotion is found in the families and this delays the recovery (Schwartz -90, Asarnow -93, -94). Family and marital problems as well as family illness are more common among adolescents with conduct disorder than among those with severe mood disorder (Goodyer -85). In one study family conflicts and aggression were related to conduct disorder but not to depression (Dadds -92). Family discord is associated with increased incidence of conduct disorder and substance abuse in children both when they are at high and low risk for depression according to the family histories (Weissman -92).

Adverse family circumstances and suicidal behaviour in adolescents are related (Fergusson -95b, Pfeffer -98). The majority of adolescents with suicidal behaviour describe the families as disengaged (Summerville -94). The combination of perceived lack of support, low self-esteem and depression is deleterious (de Man -92, Miller -92, Adams -94b). Suicidal adolescents have met less support (Kienhorst -90b, de Man -93a), more changes in life and more physical and sexual abuse (Kienhorst -92, de Wilde -94). Family dysfunction and poor relations to parents influence suicidal behaviour both indirectly through depression (Kandel -91, King -93b, Martin -95a) and by an independent influence (Hollis -96). Adolescents who make suicide attempts have more serious social

problems than suicidal young adults (Kotila -89). Adolescent suicide victims have often met instability and discord in their families and been exposed to physical abuse (Brent -94a).

Protection against depression is related to good family relations (Forehand -91, Canals -97). Cohesion and support within the family seem to be more important than the structure of the family (Garrison -97). Good family relations lead to a better outcome of depression for adolescents (Sanford -95) as well as for adults (Keitner -95). Well adjusted adolescents perceive their parents as more caring and supportive (Kashani -87f). Perceived support from the family, but not from friends, seems to be protective in youth (Greenberg -83, Procidano -83, Glyshaw -89, Barrera -92, Seiffge-Krenke -93).

Even if they are not protective relations to friends are important. Adolescents with major depression or dysthymia have difficulties in relation to both parents, siblings and peers (Puig-Antich -93). Not being accepted by peers is one predictive factor for major depression (Reinherz -93b). The peers' negative evaluations of a child's competencies are related to negative self-references and self-reported depression (Cole -95). Being unpopular and having friendship problems are related to depression in cross-sectional studies of children (Goodyer -90b, Jacobsen -83). In another study rejection by peers was not found in childhood depression, only when depression was combined with externalising disorder (Asarnow -88a). Friendship difficulties can delay the recovery from emotional disorder in children (Goodyer -91b). Dysthymic adolescents have less support from friends (Klein -97). On the other hand depressed adolescents with substance abuse are more involved with peers than well adapted adolescents are (Kandel -96).

Parenting and adolescent function

Self-esteem is due to good relations to parents (Litovsky -85, Walker -86, Blyth -88, Brown -90a, Field -95). Depressed children and adolescents have a low self esteem (King -93a, de Man -93b, Orvaschel -97) and this is associated with

parental rejection and family dysfunction (Parker -79, Kaslow -84, Robertson -89, Fleming -90). A low self-esteem negatively influences the ability to make use of social support in a crisis, increases the risk for depression and delays recovery (Andrews -88, Brown -90b,c,d). Life stress can easily cause onset of major depression in the presence of low self-esteem in women (Miller -89). Depressed adolescents have a low social self-confidence (Marton -93b). The problems with self-consciousness and self-esteem are specific to adolescent depression and not found so strongly related to other disorders (Lewinsohn -97).

The child's coping style seem to be related to the mother's affective quality, style and interaction (Burge -91, Hamilton -93). Adolescent depressive disorder is related to dysfunctional coping attitudes (Rohde -90, Martin -95b), negative cognitions (Garber -93), ruminating response style (Nolen-Hoeksema -93) and a problematic attributive style with cognitive errors (Jaenicke -87, Cole -93, Gladstone -95, Asarnow -88b). Adolescents who have been sexually abused have the most negative coping strategies (Cohen -96). Depressed adolescents have a cognitive distortion that is more extreme in a severe depression and that will not completely disappear with remission of the depression (Marton -89, -93a, -95, Gotlieb -93).

Self-efficacy is negatively correlated to depression (Ehrenberg -91) and hopelessness is a frequent trait in depressed children and adolescents (Kashani -89b, -92). The individual's perception of problem-solving alternatives are important for the impact of life events on depression (Adams -93, -96, Davila -95). Depressed children and adolescents have affect regulation deficits (Rudolph -94) and problems in cognitive control of anger and they easily behave aggressively (Kashani -95a). Especially if depression is combined with externalising disorder the social competence is low (McGee -92b).

Adolescents with suicidal behaviour are characterised by a more external locus of control orientation (Pearce -93). They have a problematic cognition and coping style (Lewinsohn -93a) and poor social competence (Spirito -90). Hopelessness,

negative cognitions, withdrawal and isolation are characteristic of depressed, suicidal adolescents (Kienhorst -92). One study found that suicidal youth did have greater cognitive distortion and less assertiveness than depressed adolescents who were not suicidal (Brent -90). In another study no significant psychological difference could be found between depressed adolescents and other inpatients compared to those with suicide attempts (Spirito -91, de Wilde -93).

Life-events

Many studies have found that depressed adolescents have experienced a large number of major events during their lives (Allgood-Merten -90, Berden -90, Berney -91, Garrison 91a,c, Goodyer -93c, Höök -95, Kandel 91). Other studies emphasise that only undesirable life events are related to disorders (Adams -91, Goodyer -90a, Garrison -90, Nolen-Hoeksema -92). Children of depressed mothers are exposed to a higher rate of stressful events and conditions (Adrian -93, Goodyer -93b). The effect of events which are independent of the young persons own behaviour are very much influenced by other adverse or ameliorating circumstances (Goodyer -93a). The life events have an impact on the affective-cognitive process and subsequently on behaviour (Goodyer -96). An apparent influence from parental divorce came mainly from negative social factors that were present before the divorce (Fergusson -94). Persistence of emotional disorder is related to family dysfunction but also to poor friendship and severely disappointing events for the adolescent (Goodyer -97b). Cognitions with low self-worth and self-efficacy seem to mediate the impact of stressful events to depression vulnerability (Hammen -88).

Recent events have not been found more common among depressed adolescents (Steinhaussen -86). Single events are not of much importance alone (Goodyer -96), but become important in combination with chronic strain (Goodyer -87, Rowlison -88). Neither major life events nor daily hassles seem to act as triggers for depression, although they are more common among depressive than healthy adolescents (Lewinsohn -94b). Suicide victims though were more likely to recently have experienced stressful events such as conflicts and disruptions with

parents, conflicts with boy or girl friend, legal or disciplinary problems (Brent -93b).

Daily events and stress relate to depressive symptoms in all ages (Banez -90, Wagner -88). Chronic stress, psychosocial adversities and daily events have a stronger impact than single serious events in studies of adolescent general population (Gersten -77, Jensen -91, duBois -92, McGee -92b, Esser -93, Wagner -90). Events with long term psychological threat seem to carry the greatest risk (Sandberg -93). Illness in the family causes strain and is more common in the families of depressed than healthy adolescents (de Wilde -92, Berney -91). The strain from having a single parent seems to be of greater importance among children with dysthymia than among those with major depression (Garrison -92). Disruptions in parental care and low maternal care is related to depression in adult women (Oakley-Browne -95a,b). The most serious stress with long-term sequelae including depression, anxiety, conduct problems and suicidal behaviour is physical and sexual abuse (Silverman -96). Adolescents with suicide attempts have experienced more chronic strain as well as acute negative events (Adams -94a).

Dependent events signifies that the adolescents act in a way that leads to still more negative events. Depressed adolescents compared to healthy controls have experienced more negative events during the last year, but only events depending on their own behaviour (Williamsson -95a). Youngsters with many adversities early in life seem to be prone to these self-inflicted stressful life events later on (Champion -95). High symptom level relates to subsequent negative events also in adults (Compas -87a,b). Depressed adolescents with dependent events had a lower level of depression than those without dependant events (Williamson -95a). Initial degree of depressive symptoms is a stronger predictor for future mental distress than life events (Garrison -90, Höök -95, Compas -89).

Physical and sexual abuse

Physical abuse of children and adolescents is often followed by a combination of depression and disruptive behaviour (Kazdin -85, Flisher -97). Family violence in childhood is related to adult recurrent depression (Bryer -87, Kessler -94b). Child abuse can be seen as a prolonged trauma with subsequent suicidal behaviour during adolescence (Adams -97). This picture is common in the history of incarcerated adolescents (Ulzen -98), a group with a high rate of PTSD (Steiner -97).

Sexual abuse is often found in the background to depression and suicide attempts in adolescence and young adulthood (de Wilde -92, Deykin -94, Lizardi -95, Fergusson -96b, Silverman -96, McCauley -97, Cheasty -98). In the New Zealand cohort study 5.6% of the girls and 1.4% of the boys had been seriously sexually abused before 16 years of age. The families had adjustment and alcohol problems, a high level of marital conflicts and impaired parenting (Fergusson -96b). In a Canadian study the frequency was the double and there were often both sexual and physical abuse (MacMillan -97). Abused adolescents have more drug problems than equally depressed other inpatients (Hussey -93) and they often have a disruptive and suicidal behaviour (Sansonnet-Hayden -87, Fergusson -96c). A combination of depression and PTSD is frequently found after severe sexual abuse (Brand -96). Psychotic symptoms are more frequent than in other depressed adolescents (Haley -88).

MATERIAL AND METHODS

Screening for depression

Population

The population studied is a total population of first year students, 16-17 years old, in all the senior high-schools of the town of Uppsala, a Swedish university town of 180 000 inhabitants. Since it was impossible to complete the study in only

one year, half of the schools were studied one year and the other half the following year.

Screening procedure

The first step was a screening for depression with two self-evaluation instruments, the Beck Depression Inventory (BDI) and the Center for Epidemiologic Studies - Depression Child (CES-DC). The questionnaires were filled in by the whole class together in the class-room during an ordinary lesson. Absent students were asked to do it later. All different educational programs were included: university preparing, vocational, and education for actors, dancers and musicians. Adolescents in a special unit training those who were not yet qualified for high school or had dropped out of school were also asked to take part.

Participation

		Educational program				Gender		Total
		Univers.	Vocat.	Artist	Special	Boys	Girls	
Popul.	(N)	1166	1057	59	183	1170	1295	2465
Partic.	(N)	1141	1006	56	97	1072	1228	2300
	(%)	97.9	95.2	95.2	53.0	91.6	94.8	93.3

Screening instruments

BDI, Beck's Depression Inventory, was originally made for measuring changes in depressive symptoms (Beck -61) but has been validated for depression screening among adults (Beck -74, Beck -88) and adolescents (Barrera -88, Lightfoot -85, Kendall -87, Marton -91). BDI has been widely used in adolescent patients (Williams -72, Chiles -80, Strober -81, Kutcher -89a, Kashani -90a, Ambrosini -91,) and school populations (Hammen -77, Bumbery -78, Teri -82, Baron -86). It has been evaluated also in Swedish adolescents (Larsson -90, Byrne -95, -96).

BDI consists of self-evaluative statements in 21 categories. The statements are the same as for adults except that the one about libido was changed to "interest in the opposite sex" in the Swedish version (Larsson -90). Values from 0 to 3 indicate the degree of severity. The range of total score is 0 to 63. As cut off for suspected depression score 11 has been suggested for mild, 16 for moderate and 21 for severe depression. A score of 16 and above is usually used as indication for depression (Larsson -90).

CES-DC, Center for Epidemiologic Studies - Depression Child, was developed from previously validated scales by the National institute of Mental Health, USA, to be used in community surveys of depression. This new scale, CES-D, was validated for adult population (Craig -76, Weissman -77a, Radloff -77, Roberts -80, -83, Myers -80, Lewinsohn -82, Breslau -85, Knight -97) and adolescents (Wells -87, Roberts -90,-91). It has been used as a screening instrument for depression among adults (Craig -78, -79, Boyd -82). The adult cut off score for depression was reached by one third to one half in different adolescent populations (Schoenbach -82, Wells -87, Garrison -89, -91b). Attempts were made to apply RDC and DSM-III criteria to the scale which resulted in around 3% depression prevalence (Schoenbach -82, Garrison -89) or to count only persistent symptoms which resulted in 16% prevalence (Wells -87). A version for children, Center for Epidemiologic Studies - Depression Child, CES-DC, was evaluated with good results in adolescents (Faulstich -86, Doerfler -88, Fendrich -90a, Garrison -91b). Used with a cut off score of 31 around 10% were screened as depressed (Roberts -91). The instrument was translated to Swedish for this study by the author.

The CES-DC is a self-rating scale with 20 items with scoring 0 to 3. In sixteen of the items the scoring refers to how often a depressive symptom was present during the last week. Four items are about presence of positive feelings and cognitions and the scoring is reversed. The total score range is 0 to 60. A cut off score of 16 was recommended for adults (Weissman -77) and used also in a study of children and parents (Weissman -80). In the validation of CES-DC this was

rather the median score and a cut off at score 31 is recommended (Doerfler -88). Different optimal cut points of 12 for boys and 22 for girls were calculated by receiver operating curves (Garrison -91b). In this study a cut off at 30 was used. If they also had a BDI score of at least 11 they were considered in the calculation of prevalence for the last year.

Statistics were computed with the SPSS software package. Internal consistency was analysed with Cronbach's alpha, inter-item and item-total correlations. Gender differences were analysed with Student's t-test. A factor analysis with varimax rotated factor matrix was carried out for the whole sample and for the sample split into two halves as well as for the different genders separately. Specificity was investigated with a highly structured diagnostic interview according to DSM-III-R and compared between genders.

Diagnostic interview

A diagnostic interview was performed with all students who had high depression scores in self-evaluation (BDI≥16 or CES-DC≥30 + BDI≥11) or reported previous suicide attempts. For each of them was chosen as a control the student of the same sex in the same class that was closest in age and had a screening result with BDI<16 and CES-DC<30.

DICA-R-A, Diagnostic Interview for Children and Adolescents in the revised form according to DSM-III-R for adolescents (APA -87), was presented to depressed adolescents and controls. This is a structured interview assessing life-time diagnosis relevant for this age. It was developed by Herjanic and Reich (-82) and was shown to have good reliability and validity (Welner -87, Boyle -93b), but not a total concordance with clinical diagnoses (Ezpeleta -97). It has been widely used in studies of general population and special subgroups (Livingston -90, Famularo -96, Ulzen -98), and in patients (Kashani -90b, Marton -91, Jolly -94, Myers -93). It was translated into Swedish for this study by the author.

Students were called in for the interview during school hours. The interviews were performed as soon as possible after the screening: 37% within one month, 20% during the second, 14% during the third, 13% during the fourth, 13% during the fifth and sixth months and 3% later. More than half of the interviews were performed by the same psychiatrist (the author) and the remaining by two psychiatry nurses, two psychologists and one student. They were all individually trained by the psychiatrist. In 27 of the interviews another psychiatrist made a simultaneous scoring with the interviewer. There were no differences in diagnostic results, only small discrepancies in details.

Participation

		Educational program				Gender		Total
		Univers.	Vocat.	Artist	Special	Boys	Girls	
Screened populat.	(N)	1142	1006	56	96	1072	1228	2300
Screening result:								
High scores	(N)	131	121	13	19	64	220	284
Suicide attempts	(N)	23	27	3	3	13	43	56
To interview	(N)	154	148	16	22	77	263	340
Interview								
with probands	(N)	141	132	13	15	68	233	301
	(%)	91.6	89.2	81.3	68.2	88.3	88.6	88.5
with controls	(N)	145	136	12	12	68	237	305
	(%)	94.2	91.9	75.0	54.5	88.3	90.1	89.7
with all	(N)	286	268	25	27	136	470	606
	(%)	92.9	90.5	78.1	61.4	88.3	89.4	89.1

Epidemiology and comorbidity

Prevalences of depression were counted among the 2300 participating in screening irrespective of that some interviews were never performed. Prevalence during the last year was calculated from those with high depression scores at screening and a depression diagnosis during the last year according to the

interview. For calculation of life-time prevalence were taken account of all students interviewed (high-scorers, suicide attempters and controls), together one fourth of the population of 2300.

For the case control analysis of psychiatric diagnoses other than depression 186 pairs were used, 37 male and 149 female. Adolescents with depression scores at screening and an interview diagnosis of depression during the last year were compared to students without depression scores at screening and without life time diagnosis of depression. The proband diagnosis was double depression in 70.5% of the girls and 62% of the boys, major depression episode in 18.5% and 17% and dysthymia in 11% and 21% respectively.

A new control was chosen when the originally matched control could not be used i.e. was not interviewed or had a life time diagnosis of depression. This was the case in 55 pairs, 43 female and 12 male. Among those 42 had a life time diagnosis of depression, 9 refused the interview and 4 could not be reached. The majority of the new controls could be found in the same educational program in the same school and a few in another school or a slightly different educational program.

Although this is a total investigation the matched pairs are regarded as a sample over time and McNemar significance test for pairwise differences of different comorbid diagnoses are calculated by the SPSS software package.

Social network and life events

Participation

All students who had been interviewed were asked to fill in self-evaluation questionnaires about life events, social network and personality. This was completed by 291 of the 301 depressed or suicidal adolescents and 302 of the 305 controls, 98% of those who had been previously interviewed.

Instruments

ISSI, the Interview Schedule for Social Interaction, was developed, used and evaluated for adults (Henderson -78, -80, Duncan-Jones -81). The Swedish ISSI questionnaire for self-evaluation in population studies was constructed and evaluated by Undén and Orth-Gomer (Undén -89) and has been successfully used in Swedish adults (Engström -91, Ternlund -93, Nettelblad -95, Wadsby -96) and adolescents (Samuelsson -94).

The schedule is composed of four subscales: AVSI - availability of social interaction; ADSI - adequacy of social interaction; AVAT - availability of attachment; ADAT - adequacy of attachment. The score range is 0-9 based on nine items for each subscale except for AVAT with range 0-5 and five items. Each item is given a value of zero or one and the values are added within each subscale.

KSP, the Karolinska Scale of Personality, was developed in Swedish (Schalling -83). The long term stability of personality traits has been investigated (Gustavsson -96). Personality traits has been studied in relation to platelet MAO activity in general population (Schalling -87, af Klinteberg -87). Especially impulsivity has been of interest (Schalling -88). The KSP has been used in many studies of adult patients: depressive disorder and suicidality (Perris -84, Nordström -95, Engström -96), pain and other somatic complaints (von Knorring -87a, Uvnäs-Moberg -91), alcohol abuse (Hallman -90), personality disorder (Ekselius -94), criminality and psychopathy (Mattson -80, Stålenheim -97). The KSP has also been used for studies of personality in male adolescents (Olweus -80) and in alcohol abusing boys (Rydelius -83, von Knorring -87b).

KSP consists of 135 statements to be registered how well they apply: not at all, not especially, pretty well, exactly. Six of these statements are about the family of origin and these are used in this study to evaluate the perceived family climate. The first three of the family statements are framed positively and scored 1-4. The

next three are negative and the scoring is reversed. The sum of these scores is used as a measure of perceived family climate with a theoretical range of 6-24.

LE, the Life-event questionnaire by Coddington (-72) was tested in British children (Monaghan -79). It has been used in studies of general population (Berden -90, Puskar -91) and in studies of disorders among children and adolescents (Kaplan -86, Berney -91, Adams -91, -93, -96, Garrison -92, Goodyer -93c, Carton -96, Muratori -97). Events are rated for the last year an earlier in life. The questionnaire was translated into Swedish by Hurme (-83) and has been used as a self-evaluation inventory for Swedish adolescents and children (Höök -95, Wadsby -96).

This self-evaluation inventory was completed by the adolescents in this study. Only events for total life were analysed since the validity with regard to life frame has been questioned (Garrison -87). After a preliminary analysis items were omitted if they were influenced by or dependent of other items. Items with very common events for this age group were omitted and so were events not adequate to Swedish conditions. The result was a list of 21 remaining events with a mainly negative impact (Table 1 in study VI).

Analysis

The analysis was performed only with originally matched pairs, in all 177 pairs (59%), in a case-control model. Seventy-five pairs could not be used because 46 depressed adolescents and 29 controls were not interviewed or had not completed all the questionnaires (25%). The 49 pairs (16%) in which the control had a history of depressive disorder were also deleted. The proportion of the original pairs that could be used differed between the educational programs: 87 (63%) of pairs from university preparing programs, 79 (64%) from vocational programs, 6 (33%) from artistic programs, and 5 (24%) of those still preparing for senior high-school. Of the 177 pairs 38 (21.5%) were boys.

In this part of the study only probands with high scores in the depression screening were used, not those with suicide attempts only. If a CES-DC score of 30 or above should be counted as suspect depression, it was requested that the BDI score should be above 10. By mistake 17 pairs were used in spite of a BDI score of 9-10 combined with a high CES-DC score. This was the case in 11 of the analysed pairs.

The social factors were analysed in diagnostic subgroups. First they were analysed according to depression diagnosis and then the two subgroups with conduct disorder and oppositional defiant disorder were analysed separately from pure double depression, dysthymia and major depression.

First analysis groups	(N)	Comorbidity	(N)	Second analysis groups	(N)
Double depression	82	+ CD	24		
		+ ODD	23		
		+ 0	35	Double depression	35
Dysthymia	38	+ CD	3		
		+ ODD	8		
		+ 0	27	Dysthymia	27
Major depression	23	+ CD	2		
		+ ODD	1		
		+ 0	20	Major depression	20
				Depression + CD	29
Subsyndromal depr.	34			Depression + ODD	32
Total	177		143		143

CD = conduct disorder; ODD= oppositional defiant disorder

Double depression could be diagnosed in three different situations: if the adolescent had suffered from a major depressive episode during the major part of the last year, if an episode of major depression was followed by remaining symptoms enough for dysthymia diagnosis, if major depression was super-imposed on a state of dysthymia. The adolescents with major depression had their actual episode during the last year but it was of a shorter duration, 1-4 months in

60% of the cases (2-4 weeks in 20%, 4-6 months in 20%). Subsyndromal depression means a high depression score in screening but no definite diagnosis of depression.

Statistics

All analyses are based on the pairwise differences between adolescents with and without depression. The Kruskal-Wallis test is used to compare the pairwise differences between diagnostic groups. If at least one group tended to yield larger pairwise differences than the other groups, multiple comparisons were made to determine which groups of pairs differed (Conover -80). A significance level of 5% is used and reported.

A multiple linear regression analysis of 123 pairs was made using only pairs with controls without disruptive diagnosis and the major depression group pure i.e. without disruptive disorder. As dependent variable each of the ISSI subscales and the KSP family scale was used. Dummy variables for gender and six diagnostic groups (double depression with conduct disorder, with oppositional defiant disorder, and without disruptive disorder, as well as dysthymia with the same three subgroups) were used as independent variables, leaving the group with major depression and without disruptive disorder as reference. A forward stepwise analysis was performed. The final model contained variables with coefficients significant at 5% significance level.

Regarding the 21 life events all the 143 probands with a diagnosis of depression and their controls were analysed with a conditional logistic regression. Successive elimination of non-significant factors resulted in five remaining events with significant odds ratios reported with 95% confidence intervals. The diagnostic subgroups were too small to allow the same type of analysis.

RESULTS

The Beck Depression Inventory

Beck's Depression Inventory performed well in the 2270 adolescents who answered all the items of the questionnaire. Internal consistency measured by Cronbach's alpha was 0.89. The correlations between each item and the total score were acceptable (0.31 to 0.69). The best correlations emerged for the items depressed mood, suicidal ideation, failure, self-dislike, guilt, and dissatisfaction (>0.6). The girls had higher scores on each item and totally. The mean score was 7.8 for girls and 4.2 for boys and the median 6 and 2 respectively. Ten percent of the girls reached score 18 or more and ten percent of the boys reached score 11 or more.

The level for suspected moderate depression (≥16) was passed by 9.8% of the 2300 adolescents, 14.2% of the girls and 4.8% of the boys. Suspected severe depression with scores of 21 or more was reached by 7.2% of the girls and 1.8% of the boys. Suicidal ideation was three times as common among the girls than the boys: self-hurting ideas in 16% versus 4%, death wishes in 3% versus 1% and more active plans in 1% versus 0.5%. The girls reported a previous suicide attempt in 7.4% and the boys in 2.5%.

The specificity of the instrument was 73% for life time depressive disorder with the cut off at score 16 (75% for girls and 65% for boys). Using the cut off for severe depression the specificity was increased to 81%, but half of the true cases were lost. An attempt to evaluate a point prevalence by requesting a score of 2 on the items covering the symptoms belonging to the DSM-III-R criteria for major depression, resulted in a point prevalence of 3.1% for girls and 1.3% for boys. The required duration of two weeks for diagnosis cannot be guaranteed though.

A factor analysis revealed different main factors for boys and girls. For girls self-dislike, guilt, failure, feeling unattractive and suicidal ideation explained 31.8%. For boys depressed mood, crying and suicidal ideation explained 28.6%

of the variation. The second factor enclosing work impairment, insomnia, and fatigue was the same for boys and girls. So was also the third factor with withdrawal and loss of interest in the opposite sex, as well as the fourth factor with anorexia and weight loss.

The CES-DC questionnaire

The CES-DC questionnaire was completely answered by 2272 adolescents. The internal consistency was high with a Cronbach's alpha of 0.91. The correlations between each item and total score were acceptable (0.38 to 0.80). The best correlations were for the items depressed mood, feeling sad, feeling blue, and crying (>0.7). Three of the four positively stated items had low correlations: feeling good, hopeful, and happy (<0.5).

The mean score was 16.5 for girls 9.9 for boys, and the median score 14 and 8 respectively. Ten percent of the girls had a score of 34 or more and ten percent of the boys 22 or more. The level for suspected moderate depression in adults (≥16) was passed by 44.4% of the girls and 18.5% of the boys and for severe depression (≥21) by 21.6% of the girls and 5.1% of the boys. Used with the higher cut off (≥30) recommended for adolescents 15.7% of the girls and 4.1% of the boys passed the limit. High scores of 40 or more were recorded in 4.0% of the girls and 1.2% of the boys.

The specificity of the instrument was 71% with cut off at score of 30 (73% for girls and 63% for boys). Diagnosis was ascertained by the structured interview DICA-R-A rendering life time diagnoses. The specificity did not increase if the cut off was set to 40, but three quarters of probands had not been selected. There are some indications that a cut off at score 21 would have given the same specificity.

The girls had a higher scoring both totally and on each item. Boys had a 0-score more often than girls for every item. Girls had higher frequency of score 1-3 on

every item with one exception: boys had more often a score of 3 on the four positively framed items. This could indicate that boys dissimulate or cannot understand the questions.

A factor analysis revealed the same main factor for boys and girls explaining 38.6% of the variation. The items enclosed were crying, feeling sad, depressed, bothered, blue and fearful. The second factor contained feeling tired and difficulties to "get going" and concentrate. The third factor was feeling rejected, lonely and disliked and the fourth was constituted by three of the positive statements.

Epidemiology of affective disorder

Suspected depression in self-evaluation was indicated in 12.3% or 284 of the 2300 adolescents who took part in the screening. That is 17.9% of the 1228 girls and 6.0% of the 1072 boys. Among those 88% or 251 (196 girls and 55 boys) conceded to be interviewed by the DICA-R-A.

The one-year prevalence figures were counted only from those with a self-evaluation indicating depression. The life-time prevalence of affective diagnoses were calculated using all the interviews performed: adolescents with suspected depression, with previous suicide attempts, and controls.

During the major depression episode one third of the girls as well as of the boys had suicidal ideation for at least two weeks.

Among those with a last-year diagnosis of major depression 18.1% had experienced short hypomanic episodes and among all with a life-time history of major depression 13.2% had.

Diagnosis	Girls (% of 1228)	Boys (% of 1072)	Total (% of 2300)
The last year:			
Major depression (MDD)	8.9	2.3	5.8
Dysthymia	1.4	0.7	1.0
Dysthymia + earlier MDD	1.9	0.5	1.2
MDD or dysthymia	12.1	3.5	8.1
Life-time:			
Major depression	17.7	4.2	11.4
Hypomania/mania	2.4	1.2	1.8

Comorbidity in adolescent depression

Adolescents with depressive disorder during the last year fulfilled the criteria for other psychiatric disorders more often than controls without life time depression diagnosis and matched for gender and education. Any other diagnosis was found in 87% of probands and in 33% of controls.

Conduct disorder was diagnosed among probands in 24% compared to 4% among controls. It was 3 times more common in double depression than in major depression and 5 times more common than in dysthymia. A childhood anxiety diagnosis, mostly overanxious disorder, was present in 57% of depressed and 6.5% of controls. Panic attacks were reported by 12% of the depressed and not at all by controls. Agoraphobia, eating disorder, posttraumatic stress disorder, gender identity problems and psychotic symptoms were found only among depressed adolescents.

Conduct disorder was comorbid to double depression and to bipolar disorder in 30% but to major depression episode or dysthymia only in 10%. A child anxiety diagnosis during adolescence was found in all types of depression in around one third of the cases. Panic disorder was found only in the long-lasting types of depression.

Before puberty the depressed group had a childhood anxiety disorder, commonly separation anxiety, in 53% and controls in 17%. It was more than twice as common in those with adolescent major depression than in those with later dysthymia. Among the depressed adolescents 15% had a childhood ADHD and among the controls 0.5% had. Half of those with ADHD in childhood developed a conduct disorder. ADHD and conduct disorder were more common in depressed boys than depressed girls. The rate of other comorbid diagnoses did not differ significantly between boys and girls.

Tobacco was smoked regularly by 48% of depressed and 26% of controls. Alcohol was consumed regularly every week by 12% versus 6%. Abuse or dependence was already established in 6.5% of depressed and 1% of controls. None of the controls were using other drugs. Among depressed 4% regularly smoked cannabis, 1% abused street drugs and 4% had for some time submitted to regular glue sniffing. All the depressed with some sort of abuse were smoking tobacco. Among the 12 adolescents with alcohol abuse 9 had conduct disorder and 9 had made suicide attempts.

Social network and family climate

Attachment network and social network, to their extension and satisfaction, was compared pairwise between depressed adolescents and controls. Availability of close persons to trust and confide in did not differ significantly between depressed and controls, but the depressed adolescents were less contented with these relations than controls were. The social network outside the close relations was more limited and less satisfying for depressed adolescents than for controls.

When the depressed adolescents were grouped according to depression diagnosis and comorbid disruptive disorder significant differences between groups did not emerge as to the social network. For the close network there was a tendency for those with comorbid conduct or oppositional disorder to be less contended with their close relations. Adolescents with an episode of major depression not going

on for more than half a year did not differ from their controls in any aspect of the network.

The family climate was evaluated more negatively by depressed than by controls. Only the group with shorter episodes of major depression did not differ from controls. The difference was successively larger in the diagnostic groups dysthymia, double depression, comorbid oppositional defiant disorder, comorbid conduct disorder. Those with comorbid conduct disorder had a much more negative view of their family climate and close relations than their controls had.

A multiple regression analysis of the pairwise differences for diagnostic subgroups was calculated. Significant influence on family climate evaluation was found from conduct disorder, oppositional defiant disorder and double depression without disruptive disorder. In the final regression analysis the confidence intervals were significant but partly overlapping. For the ISSI subscales significant influences were seen from double depression combined with conduct disorder or oppositional defiant disorder on attachment availability (AVAT) and adequacy (ADAT) but with extensive overlapping of confidence intervals with the other diagnostic groups.

Life events

The number of stressful events and conditions in life was compared pairwise between depressed adolescents and controls. The depressed adolescents had more events than controls in 71% of the pairs. In 25% of the pairs they had an excess of 5 events or more out of 21 possible. There was a tendency for those with comorbid disruptive disorders to have a greater difference in number of events compared to controls than the groups with pure depressive diagnosis.

Events that were more common in the depressed adolescents belonged to a few categories. Above all there were conflicts within the family. Family members had also more often been diseased. The adolescents themselves had more changes in

acceptance by peers. Parents had more often been away for a job and had also more often been unemployed. The frequency of parental divorce did not differ significantly between depressed adolescents and controls. The small existing difference belonged to the group with comorbid conduct disorder.

The events that had a significant pairwise difference in the conditional logistic regression analysis were: change in popularity among peers (OR 6.42), conflicts between the parents (OR 5.57), conflicts with the parents (OR 3.46), a parent away more from home for a job (OR 2.96), self falling ill and having to stay in hospital (OR 2.69).

The diagnostic subgroups were too small to allow this type of regression analysis. From the numbers of different events in each subgroup (Table 1 in paper VI) it is obvious that the group with comorbid conduct disorder differ most from controls with more conflicts, absent parents, and illness in the families. The conflicts are both between parents and between the adolescent and the parents. The oppositional defiant group often has family conflicts and changes in relation to peers. Also the adolescents with double depression have more conflicts in the family. Among those with a shorter episode of major depression the change in relation to peers is the most prominent event, at least as frequent as among those with disruptive disorders, but they do not have more conflicts in their families than their controls. The dysthymia group had no dominating type of event.

DISCUSSION

The population and participation

This is an investigation of a total school population, even if the different schools could not be screened during the same year for practical reasons. Thus no general conclusions can be drawn about other populations. It also means that the figures stand exactly for what they are and significance tests are in that sense not

applicable. The important issue is the losses of individuals from the population used. Even if the losses in the screening stage are relatively small they are not at all evenly distributed.

More than half of the adolescents not participating belong to the group still outside ordinary senior high-school, a group never before used in school studies. Within this group we apparently managed to reach those with the best psychosocial function. An important group of boys with very problematic behaviour was impossible to get in touch with, even with very good help from the school staff. Among those who did participate the frequency of high depression scores and suicide attempts was very high compared to the students in the ordinary senior high school. This implicates that 3.5% of the total population with probably very high rates of both depression and disruptive disorder are left outside the investigation.

Very few of the students in ordinary classes refused to take part in the screening. Most of those not participating could not be reached because they were very often absent. This could reflect both emotional and disruptive disorder and there is no reason to believe that they would have had a lower rate of depression than those reached for the screening. Thus the calculated prevalence of depression would probably have been still higher with a higher participation rate.

The prevalence figures are calculated for all the 2300 participating in the screening, irrespective of that 11.5% (39 of 340) high scorers were not interviewed. Half of those refused the interview and the rest could not be reached because they had left school or were frequently absent. This again could implicate a loss of a group with a high rate of depression. Even if the same rate of major depression had been found in this group as in the group that was interviewed, a total participation would have increased the one year prevalence of major depression by another percent. The same calculation for life-time prevalence of major depression would have increased the figure by almost one and a half percent.

The matching

In the comorbidity study all probands with depression scores in the screening and a diagnosis of major depression or dysthymia during the last year were used. In the originally matched pairs, where the controls were not interviewed or had a life time diagnosis of depression, a new control was chosen matched for gender and educational program. The advantage of choosing new matches was that the number of pairs was increased with forty percent. The matching was not exactly as good as the original matching, but good enough to get a fairly equal type of education and school environment even if the proband and the control were not always in the same school-class. The family socio-economic standard could not be used in the matching, simply because it was not known, but the chosen education tends to reflect the tradition of the family. It will also influence the future socio-economic standards of the adolescents themselves.

In the studies of social network, family climate and life events only the originally matched pairs were used. Here the matching was very important. Probands and controls studied and had their daily life in the same social context. All analyses are also made pairwise. The pairs became fewer but still many enough to divide into diagnostic subgroups to be able to show the differences between pure depression of long and short duration and depression with comorbid disruptive disorders. An important problem was that most of the pairs were lost from the group still outside ordinary senior high-school. In that group the interview rate was very low both among probands and controls. Many controls also had a depression diagnosis.

Another important issue in this part of the study is that the controls are not exactly free from depressive symptoms even if they do not have a diagnosis of depression. They were chosen among all students with screening scores below the cut off for being a case and thus some of those might suffer from a subsyndromal depression. If only controls with screening scores below the levels for any

suspected depression had been chosen, the differences between cases and controls would probably have been still larger.

The instruments

BDI, the Beck Depression Inventory, is very thoroughly validated for epidemiological studies. The inventory also has very good properties in studies of adolescents. In a school population it is not appreciated that there are no alternatives on any item announcing a well-being, only absence of depressive symptoms. Although the BDI is performing very well, this would motivate a search for an instrument constructed for screening among adolescents. Questions have also been raised about the problems with the large score differences between boys and girls and if there ought to be a lower cut off for boys in the screening for depression. In this study this would not have improved the performance of the instrument. The specificity in the BDI score interval 11-15 was very low for boys, much lower than for girls.

The other screening instrument **CES-DC**, Center for Epidemiologic Studies - Depression Child, was constructed for adolescents on the basis of the adult questionnaire and the questions were well accepted by the adolescents. It is not like BDI, describing severity degrees of symptoms, but instead frequency of the different feelings during the last week. It is questionable whether scores of one, i.e. the feeling has occurred only a few times, should be counted. Another problem is that the wording of the positive statements are difficult to understand. Sometimes double negations cannot be escaped and this creates some problems in understanding, especially for adolescents with traits of dyslexia. Some boys tended to answer all statements in the same line, that is denying every feeling, also the positive ones. That could of course be used as an indication of not understanding or a wish to dissimulate. These answers then should be left aside or otherwise they will distort the results. In this study these students were asked specially to read it through once more and see if they really had answered the way they meant to answer. No questionnaires were left aside in the analysis.

Those who have denied also positive feeling thus have got a higher scoring, but still in the low range. They are not many enough to influence the mean scores.

DICA, the Diagnostic Interview for Children and Adolescents, is highly structured. This diminishes the problems with inter-rater reliability and allows for more variation in basic education of interviewers. Its short-comings, though, are very obvious. It cannot be stated for sure that a depression diagnosis from a DICA interview is a clinical depression. It has a high sensitivity and will tend to overdiagnose (Roberts -89). There are no probing about severity of symptoms or restriction in function at school or in the family, which would lead to seeking medical help. On the other hand even children with unrecognised disorders in a population study have been found impaired by their depression (Costello -89b). Another thing is that the assurance that the different symptom have been present at the same time is not satisfactory. These are of course the same problems as in other studies using this instrument and a comparison of prevalence could be made to those studies. There will probably not be an overdiagnosing of long-lasting depressions but could be of the shorter major depression episodes.

Since DICA is assessing the life time diagnosis, the age for the latest depressive episode had to be added. It was not specified if the depression had been going on in full extent at the time for the screening. For this reason the rate of major depression had to be presented as a one year prevalence, even if all probands had high depression scores at the screening. It will probably be correct to regard the one year prevalence as a point prevalence of major depression at least not in full remission.

ISSI, Interview Schedule for Social Interaction, in the self-evaluation form seemed to be acceptable to the adolescents. The scoring varied widely between individuals. The greatest problem is that one of the subscales, Availability of Attachment, has fewer questions and a more narrow range of scores. There were no pairwise difference between cases and controls on that subscale which it was in the other subscales. It is unclear whether a difference would have emerged if this

scale had been equal in range to the other three scales. This was the reason for trying to find more answers how they evaluated their families of origin. If all groups did have a close network and persons who did care and offer comfort, it was of interest to find out why the quality of the contact was not satisfying.

KSP, the Karolinska Scale of Personality, and its subscale Sociability has attracted much interest in studies of antisocial disorder. The six statements, used in this study as a measure of family climate, are directly referring to the childhood and the family with appreciations and regrets. They all belong to the Sociability subscale and it could be argued that they describe a trait in the personality, not only a statement about the family climate. Those with a low scoring on this 6-item family climate scale, in the interview have described a lot of serious problems in the family such as alcoholism, fighting, physical abuse, police interventions, illness and accidents. Thus this corresponds well with a negative family climate, which seems to be a reality in the adolescents' lives, not only a depressive cognitive distortion. These relations will of course also influence the personality of a child growing up into adulthood.

LE, Coddington's Life Event Scale, asks for a lot of events and conditions and if they have occurred during the last year or earlier in life. There is some doubt if adolescents do remember everything correctly and if they assign it to the right time in life and the results are presented only for their total lives. Some of the events are of a positive character and it has been questioned if these should be used in assessing factors that are supposed to influence the mental health negatively. Only twenty-one events with a probably negative impact were used in the analysis of results. Another problem is that some of the so called events are not really distinct events but rather conditions during a longer time, for example conflicts going on in the family.

One question is about change in popularity among peers. This could be for better or worse and is very difficult to interpret. Since this study is made with students that have recently left compulsory school for senior high-school there is a certain

possibility that their popularity has gone through a change, unless they are very stable in being easy-going and popular or the quite opposite. If they record a change in the self-evaluation it might mean that they either are not for the present or were not before quite confident in their relations to peers. On the other hand this question does not select those with continuously bad relations to peers, a serious draw back of the questionnaire.

The greatest problem with LE is that it omits very harmful events and conditions. It does not ask about bullying, fights, rape, sexual or physical abuse within the family or suicide attempts among family members. Those delicate question might not be truly answered by everyone, but that is no reason for leaving them out. In the DICA interview a question about sexual abuse was added, but some refused to answer the question and a few told about less serious abuse. They also knew that we had to take precautions if they were involved in seriously harmful situations.

The results

The Beck Depression Inventory

In the screening with BDI the total frequency of scores of 16 or above did not differ from other studies. Since these boys and girls are post-pubertal a gender difference should be expected. Here it was as high as three girls for every boy, which is more than in other studies This gender difference might have been a little smaller if all the boys outside ordinary senior high-school had been reached. The other important gender difference was found in the factor analysis. Boys had a main factor with the basic affective symptoms: depressed mood, crying and suicidal ideation. The alarming finding was that girls had symptoms of guilt and devaluation of themselves together with suicidal ideation, not symptoms of depressed mood, as the characteristic traits. Girls also had almost three times higher frequency of suicidal ideation and suicide attempts than boys. They also had thoughts about hurting themselves four times as often as boys.

Why girls have that negative and depressive thinking about themselves cannot be answered in a study like this. The question arising is whether this really is an effect of depression or an effect of the values in society leading to depression in girls. It could be that this low self-esteem is prevalent already in girls without a depression, in the form of a general feminine trait. These negative cognitions could also be the earliest occurring symptoms of female depression. The groups of boys and girls with high depression scores were too small to give a clear answer in a separate factor analysis. If this gender difference in self-concept really is an effect of depression, we have no answer why boys and girls react in different ways. The tendency for girls to turn feelings inwards against themselves and boys to act out their feelings could be associated with this. One problem is that girls do act out in a self-hurting behaviour.

The CES-DC questionnaire

The screening with CES-DC gave an even larger gender difference in high scoring than the BDI did. Nearly four girls for every boy passed the limit of score 30 for suspected severe depression. The specificity was almost as high as that of the BDI. The factor analysis of this questionnaire gave the same main factor for boys and girls. In the CES-DC the statements about devaluation of oneself are not present. Still the specificity tended to be better for girls than for boys with CES-DC like it was with the BDI. If boys do not admit difficult feelings as easily as girls in the self-evaluation, and the structured interview also probes all the more physical symptoms of depression, one would expect at least the same specificity when the same cut off is used. Receiver operating curves, which demand diagnostic interview of a sample or all participants, could not be applicated in this type of study. When such analyses have been done with BDI and other questionnaires the optimal cut off has always been lower for boys than for girls. The reason for this has not been explained.

Epidemiology

The depression prevalences accounted for are minimal figures. The one year prevalence of major depression 5.8% consists of adolescents with high depression

scores at screening and a diagnosis of depression during the last year according to the interview. The percentage is counted from the total screening material of 2300. The losses from the interview are in groups with probably at least the same high rate of depression and the prevalence would have increased if they had all been interviewed. In spite of that the prevalence is rather high. This could be interpreted that adolescents in Sweden have more depression than in other countries, but this is not very probable. Other studies of high school populations have not tried to reach the groups outside school. Longitudinal studies of cohorts also have high prevalences (Feehan -94, Kienhorst -90a). In a total investigation like this the possibility to analyse the losses is better than it is in studies of samples. Half of the adolescents not reached in this study come from socially problematic groups where depression rates could be very high. Probably this is the reality also in studies of samples but cannot so easily be demonstrated. The participation rate in a study of depression prevalence thus seems to be crucial to the results and a high participation rate probably leads to a higher prevalence.

The gender difference with three to four times as many depressed girls than boys both in screening and interview was larger than in other studies. A lower screening cut off would not have changed this, since the specificity in the mild to moderate range of scores were better for girls than for boys. Boys with depression have a lot of disruptive behaviour and a large group of these boys were never reached for the screening. Boys had a higher frequency of subsyndromal depression than girls, that is interviews without depression diagnosis in spite of high depression scores.

The life time prevalence is calculated from all interviews in relation to the total screened population of 2300. For major depression this prevalence of 11.4% may be more adequate than the one year prevalence figure. The reason is that also depressions among controls and those with previous suicide attempts without ongoing depression come into the calculation. There were more depressions among controls in the classes where high depression scores were more common.

Still three quarters of the total population were not interviewed and they would hold some cases even if there is reason to believe that the frequency is low.

Episodes of hypomania were diagnosed in almost 2% of the population and in 13% of those with a life time major depression episode. These figures are probably rather close to the real prevalence. Half of the hypomanic cases were found in the group with previous suicide attempts and there could possibly have been a few more in a little group not reached for the interview. Only four cases without a depressive episode were found and two of those were controls. Among all those with hypomanic episodes 12% had ADHD as children and 28.5% had conduct disorder, a comorbidity in accordance with the results in earlier studies.

Comorbidity

Adolescents with a depressive disorder have many more other mental symptoms and diagnoses than controls without depressive disorder. In adolescence they have more anxiety disorders and more conduct disorders. Increased comorbidity seems to reflect a more serious disorder. Those with double depression have more comorbid diagnoses than the major depression and dysthymia groups in contrast to what was found by Lewinsohn's group (Rohde -91). Whether this is really a comorbidity or increasing symptoms of different types when the disease becomes more serious has to be currently questioned (Caron -91).

Depressed adolescents had more often suffered from separation anxiety in prepubertal childhood. Other diagnoses, mostly anxiety, in many studies have been shown to precede depressive disorder. Since this pattern is so common it could be hypothesised that depression and anxiety have the same vulnerability or even belong to the same disorder. This is indicated in both familial and genetic studies. In this study childhood anxiety disorder was found in more than half of the depressive adolescents and it probably had preceded the first major depression, but that could not be stated for sure. Among controls it was found in one third of the frequency of that in depressed adolescents. A forthcoming

follow-up study will show if these adolescents will develop depressive disorder in the future.

Panic disorder are known to frequently be concomitant with depression and increase the severity of the disorder. It was found in 6.5% of depressed adolescents. In adults it is also found as a separate disorder, but in this study we found no case of panic disorder among the 186 controls.

Almost all adolescents with childhood ADHD have passed an episode of depressive disorder, even the fifth of them who were not screened as depressed but were interviewed as controls. Half of the children with a history of ADHD have conduct disorder. One fourth of those with ADHD in childhood have an abuse of alcohol or drugs whether they were screened as depressed or not. A history of ADHD is found in one third of the depressed adolescents with comorbid conduct disorder. Thus there are strong relations between ADHD, depression, conduct disorder and substance abuse. ADHD and conduct disorder are the only diagnoses comorbid to depression that are more frequent in boys than girls.

Conduct disorder is comorbid to depression in one fourth of the cases. It is most frequent in the group with double depression. Oppositional defiant disorder is equally common in boys and girls, but boys always have conduct disorder in combination with it. Oppositional disorder like conduct disorder is most frequent in double depression.

Among those with high depression scores or a previous suicide attempt 29, or almost 10% of those interviewed, were abusing alcohol or other drugs and all of them smoked tobacco. Use of tobacco seems to be a prerequisite for all other forms of abuse in this Swedish population like in American studies. Among these abusing adolescents 25 had a life time major depressive disorder, 15 had conduct disorder, and 23 had made suicide attempts. Among controls were found four alcohol abusers and two of them had a major depressive disorder and one had

conduct disorder as well. The proportion of girls is unexpectedly high. Even if depressed boys had a higher frequency of abuse, the total number of abusing girls was higher among both depressed and controls, an observation that needs to be followed up. The conclusion from this is that all forms of abuse at this early age is strongly related to depression and that this is a very serious dual diagnosis with risk for suicide mortality.

Serious disorders as PTSD, eating disorder, gender identity problems and psychotic symptoms were found in a few percent among depressed but not at all in controls. The traumatising events in the adolescents with PTSD were mostly occurring together with other family problems. Many problematic circumstances that could promote the depression were present. Eating disorders have a well known component of depression. Gender identity problems can probably in these years of age elicit depressive problems. Whether the psychotic symptoms are related to depressive episodes cannot be concluded because of deficiencies in the interview structure. At least one boy suffered from a schizophrenic disorder with depression.

Social network

The social network was explored in relation to type of depression and comorbid disruptive disorder. The depressed adolescents had a more limited and unsatisfying network than their controls. The only diagnostic subgroups that did not clearly differ from controls were those with a shorter major depressive episode or subsyndromal depression. Short episodes do not seem to influence relations in the destructive way as long term depressions do. No difference from controls could be found in the aspect of attachment network in any subgroup, but the depressed adolescents with disturbed conduct or long term depression were less satisfied with their close relations than the controls were. The depressive cognition could confound these results (Slavin -89).

The analysis of six question about family climate from the KSP was tried to find out if the quality of the available close relations could explain the confusing

result. A very clear case-control difference in the evaluation of family climate was found in the group with conduct disorder, while those with a shorter episode of pure major depression did not differ from their controls. Among those with a negative view of the family climate the interview in many cases revealed serious conditions and events within the family, e.g. alcoholism, fights, physical abuse, police interventions, illness and accidents. This confirms that the problematic family situation is a reality that would be rated very negative even without a depressive distortion of the cognition. Of course the adolescents themselves could add to the problems in the family by the provoking behaviour associated with conduct or oppositional disorder. Depressed adolescents also withdraw from their families in a provoking way (Larson -90).

Another factor that could influence the evaluation of close relations was an impression from the interviews that the depressed adolescents more often had their close relations to other adolescents and not to their parents. A Dutch study of depressed adolescents with high risk for suicide attempts also found that these adolescents relied more on peers (de Wilde -92). When relationship to parents are good adolescents confide in them but with a chronic family turmoil they turn to friends (Monck -91, Aseltine -94). This could explain why some adolescents were not getting comfort to their satisfaction. They are young enough to need more stable support from trustworthy adults. Several studies have also shown that good relations to parents can protect against depression, which peer relations are not capable to do.

Since this is a case-control study no conclusions can be drawn about cause and effect. Bad relations theoretically could have their roots in the adolescents' depression and their own behaviour. On the other hand the serious family conditions revealed in the interviews were strongly related to low scores on the family climate scale. It does not seems plausible that these adversities should be a result of the adolescents depression. As much as 80% of those with low scores on the family climate scale suffered from double depression and half of these adolescents had a conduct disorder as well. More than half of those with conduct

disorder had very low family climate scores in contrast to those with a major depressive episode without conduct disorder. Among those very few had low scores and more than half had high scores. This could be compared to an adult study where dissatisfaction with the family was not state-dependent but evaluation of social contacts were (Rosenbaum -96).

This indicates that problems and bad relations within the family is related to long-lasting depression and comorbid conduct disorder in line with Puig-Antich's theory. Family adversity can lead to the combination of depression and conduct disorder and a depressive episode has little possibility to remit if there is a bad climate with little support to the adolescent in the family. There is a possibility that pre-adolescent depression is more strongly related to conduct disorder and antisocial behaviour as proposed by Harrington (-97). This could not be analysed in this study since DICA does not probe the time for the first episode of depression.

Life events

The life events according to Coddington's scale were more common among depressed adolescents than controls. The group with high depression scores in screening but without diagnosis of depression did not differ from controls. There was a tendency for the group with conduct disorder to differ more from controls than the other diagnostic groups. This could be in line with a more disruptive family pattern. The conduct disorder group was characterised by more conflicts in the family and it was the only diagnostic group with more separations between parents. They also tended to have more negative events during the last year, which could be assumed to be caused by their own behaviour, so called dependent events. Also in the double depression group without conduct disorder there were more conflicts between parents. In the group with major depression episode the characteristic events were related to popularity among peers and moving to another town, both having to do more with relation to peers than with the relation to parents.

These difference between the groups could be interpreted in the same direction as the results from the family climate investigation. Long-standing depression, especially in combination with conduct disorder, is related to conflicts and problems in the family. Among adolescents with shorter depressive episodes there were not found indications of adversities in the family. The events related to shorter major depressive episodes were instead associated with peer relations. In this respect we have an important source of error, since the question about serious difficulties in relation to peers and mobbing is not adequately probed. From a clinical experience though it is well known that mobbing is an important problem in child and adolescent depression and there might be more such cases in different depressive subgroups.

There is also a possibility that short episodes of depression occur in adolescents with a family disposition for depression but with warm and good relations within the family. Good supportive relations might be the most important factor for recovery (Cohen -87, Brugha -97).

The influence from hereditary factors, although of great interest, could not be investigated in this study since parents were never involved and adolescents themselves are not informed enough to give adequate information. Genetic and psychosocial factors are probably intensely related. This is obvious especially in studies of childhood bipolar disorder with well known strong genetic factors and at the same time a frequent comorbidity with conduct disorder related to a disruptive family environment. This is a field that needs to be better understood. So far we can conclude that the combination of unipolar or bipolar disorder with conduct disorder has a serious outcome and that these adolescents and their families need qualified help.

Results in summery

Depressive disorder, as it is defined in the DSM-III-R, is a common disorder in adolescence. Short hypomanic episodes are seen early and are relatively frequent. Identification and treatment of adolescent depression is an important issue because

it is a recurrent disorder with a great suffering. Without successful treatment it might lead to educational and social disadvantages. Suicidal behaviour with a discouraging mortality is the great threat, a threat that is increased by comorbid substance abuse and conduct disorder. Suicide is the single most common cause of death in adolescent years in Sweden.

Depressive disorder has a pronounced dominance for girls appearing after puberty. Thus there is a clear biological factor, but to what extent biological and psychosocial factors respectively could explain the gender difference has never been possible to elucidate. Nor have the girls' lower self-esteem, more self-devaluating cognition or the self-hurting behaviour been explained. In boys, more often than in girls, conduct disorder is comorbid to depression. Role expectations and social factors seem to play a role for the sex differences in the psychopathology patterns during adolescence (Almqvist -86). Boys also seem to be more difficult to reach both for epidemiological studies and for treatment. There is a strong need to understand the differing clinical picture among adolescent boys and girls in order to create adequate treatment facilities.

Adolescent depression is not at all pure in its symptomatology but mixed up with symptoms enough for many comorbid diagnoses. Depressions with long duration have the most frequent comorbidity, which seems to be related to the severity of the disorder. Symptoms of anxiety and panic attacks occur in depression to an extent that raises the question if they do not belong to the same kind of vulnerability or even the same disorder. Anxiety is a very common childhood precursor to adolescent depression and the genetic factors seem to be the same for childhood anxiety and depression.

Alcohol and substance abuse is a very serious problem occurring in adolescent depression. It is alarming that the frequency is high also among girls and might even be equally high as among boys in this total population. The abuse is related also to conduct disorder and to childhood ADHD. Without tobacco smoking alcohol abuse was very seldom found in this study and without regular alcohol

use no abuse of other drugs was found. This successive development of abuse needs to be stopped at an early stage. Otherwise it can lead to social disaster and it is strongly associated with suicidal behaviour.

Adolescents with a long-lasting depression have unsatisfying social networks. This could be a result of a depressive state disturbing the relations both to parents and friends. Nor are these adolescents content with their close relations and family climate. This negative view could be a result of depressive, distorted thinking. It could also mean that depressions frequently occur when close relations are bad or do not easily remit unless the adolescents have a good support within the family. The group with depression and comorbid conduct disorder has the most negative evaluation of family and close relations. They also more often describe alcohol abuse, conflicts and violent behaviour in the family. The most plausible conclusion is that adversities in family relations have a causal connection to long-lasting depression, especially when it is combined with conduct disorder.

Stressful life-events are more common among depressed adolescents. Like the family network adversities they are most common in the conduct disordered group. A difficulty and important drawback in the study is that it was not possible get reliable information about physical and sexual abuse which has a strong relation to depression, suicidal behaviour, conduct disorder, and substance abuse. Probably it has to be investigated in a clinical setting with more time to spend with the adolescent. Alcohol abuse and violence but not sexual abuse within the family were reported by some adolescents in the interview. It is important to stress this lack of information in a study of adolescents to make the list of psychosocial factors for depressive disorder a bit more complete.

CONCLUSIONS

1. The prevalence of depressive disorder in adolescents is high. Several of them have already experienced shorter hypomanic episodes.

2. Depression has a strong female preponderance with 3-4 girls for every boy. The depressive cognitions with self-devaluation and low self-esteem are more pronounced among girls than boys.

3. The great majority of adolescents with depressive disorder have symptoms that satisfy criteria for more than one diagnosis. Anxiety disorder and depression are highly correlated during adolescence and there is indication that childhood anxiety precedes depression. Conduct disorder is frequently concurrent to depression, more often among boys than girls. Abuse of alcohol and use of other drugs are almost exclusively found in the group with depressive disorder.

4. Adolescents with a depressive disorder that has lasted longer than half a year have a more limited and unsatisfying social network. When the depression is long-lasting, and especially when it is combined with conduct disorder, the close relations are experienced as not supportive enough and the family climate as more negative.

5. Stressful events and conditions are more frequent in the lives of depressed than non-depressed adolescents. Those with long-lasting depression, especially when it is combined with conduct disorder, have had a life with a lot of stressful conditions. The majority of the events are related to adversities in the family, except in the group with shorter episodes of depression.

6. A screening for adolescent depression can be accepted by students and is possible to accomplish with acceptable specificity.

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