Socioeconomic inequalities in mental health among adolescents in Europe

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Introduction

Mental health in children and adolescents is a topic of increasing importance. Results from several research studies indicate an association between mental health problems and socioeconomic status in young people.

This paper attempts to provide a comprehensive overview of current knowledge on socioeconomic inequalities in mental health among adolescents in European countries that are members of the EU plus Norway and Switzerland. Problems associated with previous studies are discussed and needs for further research highlighted.

The first part of the paper describes the current research and presents background information on mental health in children and adolescents, which has been termed the "new morbidity". It introduces the most common disorders and summarizes previous research in the field. Against the backdrop of this summary, a variety of problems associated with research into mental health in young people is discussed. A short summary of previous European studies on mental health in children and adolescents and socioeconomic status is offered before the importance of considering positive mental health, in addition to the presence of mental ill health, is emphasized.

After extensive discussion of the results and shortcomings of previous research and different mental health concepts in the first part of the paper, the second part deals with the European project Screening for and Promotion of Health-related Well-being in Children and Adolescents: a European public health perspective (KIDSCREEN), which is a representative survey of mental well-being carried out in 13 European countries. The administration of the survey is described and results on mental health of children and adolescents for each of the 13 participating countries are presented. An overview of socioeconomic inequalities in positive mental well-being and in mental ill health within each country is then offered before the paper turns to the macro dimension of the topic, describing the connection between socioeconomic data and mental health data based on aggregated country means.

In the third and last part of the paper, findings are summarized and several discussion points on socioeconomic inequalities in mental health among adolescents in Europe are raised.

Background and summary of the current state of research

The rising importance of mental health problems and socioeconomic inequalities: the "new morbidity"

The configuration of childhood health and illness has changed considerably over the past century. The main problems of the first half of the 20th century, such as acute infections and high infant mortality, have diminished in importance *(1)*, although the causes of paediatric morbidity differ across European countries. For instance, infant mortality rates in European countries are inversely associated with national income *(2)*, and in eastern Europe, health problems such as diphtheria and tuberculosis are again prevalent *(3)*. In general, however, the incidence of most communicable diseases has fallen radically throughout Europe *(3)*. In place of the old problems, new challenges have emerged that need to be addressed by health professionals.

The so-called "new morbidity", characterized by emotional problems, conduct problems, learning disabilities and similar issues, came to the fore in the middle of the last century. Now, within the frame of the so-called "millennial morbidity" *(1)*, mental health and socioeconomic influences on health have risen to achieve significant importance within child and adolescent health.

Facing the magnitude of the burden of disease related to child and adolescent mental disorders, WHO declared in its publication *Caring for children and adolescents with mental disorders. Setting WHO directions (4)* that child mental health was "a key area of concern" to which professionals and policy-makers must direct their attention. WHO publications on the topic have

focused on barriers to care and analysis of available child and adolescent mental health resources, as can be seen in the *Atlas: child and adolescent mental health resources: global concerns* publication *(5)*.

WHO publications offer comprehensive introductions to the topics, focusing on the needs of affected children and adolescents. In publications such as the *Mental health policy and service guidance package: child and adolescent mental health policies and plans (6)*, WHO also considers risk and protective factors.

The prevalence rate of mental disorders in childhood and adolescence was estimated in 2001 as being between 10% and 20%, based on selected studies from all over the world *(7)*. The final report of the WHO European Ministerial Conference on Mental Health *(8)* concurs with this estimate, stressing that disorders seem to be on the increase and are often recurrent or chronic in nature. Higher prevalence is found among socially deprived groups, with low SES having a deleterious effect on existing mental ill health, although these trends are not specific to children and adolescents *(7)*. The effect of SES in relation to access to treatment has also been considered *(8)*.

The definition of mental health problems in childhood and adolescence is mediated by context. In clinical practice, decisions on presence or absence of mental disorder are based on definitions set out in one of the two diagnostic manuals – the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10) *(9)* or the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) *(10)* classification system. Mental disorders can be categorized into internalizing disorders, such as anxiety or depression, and externalizing disorders, including conduct disorders and attention deficit hyperactivity syndrome (ADHS).

It is nevertheless difficult to define a diagnosis according to one of the two classification systems in large epidemiological surveys. Screening instruments that allow a reliable estimate of whether a mental health problem is present or not are being used: some target specific mental disorders, while others enable a prediction of overall mental health problems without differentiating between specific disorders.

Literature on prevalence rates

WHO states that the "development of a child and adolescent mental health policy requires an understanding of the prevalence of mental health problems among children and adolescents" *(6)*. Quantifying the burden of mental disorders in children and adolescents in Europe is, however, a difficult task.

A PubMed database literature search of epidemiological studies on overall prevalence rates of mental disorders in children and adolescents in Europe from 1990 until 2007 identified many diverse studies. Some, however, do not include nationally representative data, and only studies published in English could be considered. Nine European studies from the United Kingdom *(11)*, Germany *(12)*, Switzerland *(13)*, the Netherlands *(14)*, Spain *(15)*, Norway *(16)*, France *(17)*, Finland (18), and Ireland (19) will be described in the following summary of single studies focusing on mental health in different countries.

A United Kingdom population-based sample of more than 10 000 children *(11)* found that at least one DSM-IV-TR disorder was present in approximately one in ten subjects. A representative German survey that screened approximately 3000 children and adolescents found signs of mental health problems in 22% of respondents *(12)*. Similarly, a study of approximately 2000 pupils from Zürich, Switzerland estimated a total prevalence figure for any Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised (DSM-III-R) diagnosis of 22.5% *(13)*. Corresponding to the German and the Swiss results, a study of adolescents in the Netherlands found a prevalence of any DSM-III-R disorder in around 22% in the self-report and parent-report elements *(14)*; however, there was overlap between the self report and the parent report in only 4% of cases.

These four studies present a picture of heterogeneous results in different countries. Although all studies refer to a time frame of six months, the overall prevalence estimates range from 9.5% in the United Kingdom to around 22% in Germany, Switzerland and the Netherlands, according to different case definitions.

A study from Spain that estimated mental disorders according to the DSM-III-R criteria in 8-, 11- and 15-year-olds in Valencia found a point estimate of 21.7% *(15)*, which is in the same range as the estimates from Germany, Switzerland and the Netherlands cited above. This is significant because the Spanish estimate is a point prevalence, whereas the rates from Germany, Switzerland and the Netherlands refer to a time frame of half a year.

A survey in Norway of around 30 000 children and adolescents aged from 10 to 19 found self-reported mental health problems in 12.5% of respondents (symptoms and associated burden in the previous six months were considered) *(16)*. Other countries such as France *(17)* and Finland *(18)* report prevalence rates in the same range but refer to a time frame of three months. A French study conducted in 2441 children aged from 8 to 11 years found an overall prevalence figure of 12.4%. In Finland, around 3400 8 and 9-year-olds from the south of the country were screened in a two-stage procedure, and approximately 15% were identified as being affected by a psychiatric disturbance. Another study from Ireland found a quite similar overall prevalence of current psychiatric disorder in 15.6% of pupils aged 12 to 15 years, but as a point estimate *(19)*.

The same variation becomes apparent in relation to prevalence rates of specific mental disorders. For example, prevalence of anxiety disorders ranges from approximately 4% in the United Kingdom *(11)* and Ireland *(19)* to approximately 19% in Germany *(20)*. The prevalence estimates of depression are between less-than 1% in France *(21)* and Switzerland *(13)* and 18% in Germany *(20)*. Smaller ranges have been found in relation to conduct disorders and hyperactivity, but considerable variation exists.

This small selection of studies illustrates that overall prevalence estimates vary widely. The many possible reasons for these differences will be discussed after the next section, which summarizes the conclusions of previous (and more extensive) reviews of the topic.

There are several comprehensive reviews of mental health in children and adolescents that focus on a range of aspects *(17,22–24)*. Two of these reviews *(23,24)* focus on prevalence estimates of mental disorders in different studies conducted in children and adolescents. The review of Ihle & Esser *(24)* included 19 studies from all over the world published between 1970 and 2000, six of which were longitudinal studies. All reported prevalence rates of several mental disorders in children and adolescents within large and representative samples based on structured interviews and categorical case definitions. The studies found a median rate of prevalence estimates of around 18%, with a range between 6.8% and 37.4%. Seventy-five per cent of the prevalence estimates ranged between 15% and 22%. Another review *(23)* included 52 studies from more than 20 countries carried out over four decades. All included studies gave prevalence estimates of overall psychiatric disorders by means of employing clinically meaningful definitions. This review found a mean prevalence estimate of 15.8% and a median rate of 18%. The spectrum of overall prevalence was strikingly wide, however, ranging from 1% to 51%.

In relation to specific mental disorders in children and adolescents, Ihle & Esser *(24)* found in their review that anxiety disorders were the most frequently found conditions, with an average frequency of 10.4%. The average frequency of conduct disorders was 7.5%, while depressive disorders and hyperactivity/attention-deficit disorders were found in 4.4% of the children (mean of studies). The rates of persistence were consistently high in all six longitudinal studies (more than 50%).

The two reviews discussed above *(23,24)* arrived at different results in relation to potential increases in mental disorders with age. Roberts et al. *(23)* found higher prevalence in studies including older children, but Ihle & Esser (24) did not observe an increase in mental disorders with age in their review of six cohort studies.

Regarding the assumption of increasing rates of mental health problems in young people over time, several studies provide supporting evidence. Rutter & Smith *(25)* conclude from their review that there has been a substantial rise in the prevalence of psychosocial disorders in many western nations over the past 50 years. Reviews by Fombonne *(17)* and Prosser & McArdle *(22)* arrive at the same conclusion, particularly in relation to suicide, delinquency/offending behaviour, substance misuse/addictive behaviours and depression.

Roberts et al. *(23)* compared studies from four time frames: 1970 and earlier, 1971 to 1980, 1981 to 1990 and after 1990. No evidence for an increase was found in the first three time frames. The studies conducted after 1990 reported a higher prevalence of mental disorders, but they cannot be compared with studies carried out before 1990 because of different methodological approaches. There are, however, some longitudinal studies providing comparable data that indicate a rise in conduct problems and emotional problems over time *(26)*.

These findings paint a complex picture of trends in child and adolescent mental health *(27)*. Evidence described above indicates a substantial rise in prevalence rates, but the fact that data sources are limited has to be taken into account. There are also results which suggest that increased media attention and professional awareness contribute to the rising number of referrals and diagnoses *(27,28)*.

Despite high variability of prevalence rates, it can be deduced that rates for children and adolescents are not substantially different than those for adults, indicating that mental health issues appear early in life and require early intervention.

Shortcomings of available epidemiological research

As the discussions above show, epidemiological studies targeting children's and adolescents' mental health are prone to methodological problems and challenges. A general problem, which will be addressed in detail later, is the predominant understanding of mental *health* as the absence of mental *disorder*. This leads to a lack of data regarding positive mental health in children and adolescents.

An overview of the burden of mental health problems on children and adolescents in Europe has been difficult to complete, as some countries do not have published data available in English. Studies currently apply very different methods of data collection, data analysis and data presentation. In data collection, for example, some use questionnaires, while others opt for diagnostic interviews. There are also differences in assessment tools applied to questionnaires and methods of interviewing. While some studies use structured interviews, others employ semistructured interviews which lead to systematically different results *(29)*. Furthermore, cross-cultural comparability of applied instruments is mostly not assured. Some studies use two-stage procedures, while others do not. Another important aspect is the source of information. Some prevalence rates are based on the child's self report, while others focus only on the parents, or perhaps also include teachers as sources of information. Studies relying on multiple informants integrate their data in different – and often not explicit – ways.

Similar problems are found when it comes to the definition of a case. What criteria need to be fulfilled to justify the attribution of a mental disorder to a given child or adolescent? Some studies apply diagnostic criteria (such as DSM or Rutter), while others require the presence of an identified impairment or an explicit need for mental health services. It is not surprising that studies including the factor severity in their case definitions find lower prevalence rates than those describing the number of subjects in the examined population who fulfil the diagnostic criteria. But even studies that consider impairment associated with symptoms of mental disorder do so by using a variety of methods. An additional methodological challenge regarding prevalence estimates of specific mental disorders is the high rate of co-morbidities.

It has to be recognized that there are very few studies in Europe with large and representative samples. Population-based samples are few in number because much research concentrates on specific subgroups, such as adolescents with particular risk factors and other very specific groups. Those population-based samples that do exist are not necessarily nationally representative and commonly concentrate on the populations of defined geographic areas. Furthermore, they often include children of narrow and different age ranges and are therefore not comparable. Small sample sizes often reduce the precision of estimates.

In relation to data analyses and presentation, there is no standard governing the presentation of information and reporting of results with reference to different time frames, such as point-, period- or life-time prevalence rates.

In summary, there is a lack of comparable prevalence data on mental health of children and adolescents in Europe. It can be assumed that the evident variety in mental health prevalence is not only due to real underlying differences, but also because of the wide variety of methodological problems encountered. It must be emphasized, however, that despite being based on different informants, different time frames and different classification systems, high-quality international studies display comparable prevalence rates *(24)*.

Review of studies on mental health and socioeconomic status in Europe

The focus now turns from one review exclusively concentrating on mental health to one which looks at studies in Europe that considered mental health alongside an assessment of socioeconomic status. Similar problems on comparing data from different European countries can be anticipated, and a similarly diverse methodological picture is to be found. Indeed, an even more complex picture emerges, as socioeconomic status is defined in very different ways. It is sometimes considered in terms of neighbourhood deprivation or neighbourhood inequality, while other studies look at parental occupation or family affluence (Table 1). Regardless of these challenges, there is much evidence pointing to the existence of social inequalities in mental health.

Table 1

Examples of different definitions of SES and mental health in European studies

Definition of SES	Definition of mental health	Publication
Household income	Emotional and behavioural problems	Prescott-Clarke & Primatesta *(30)*
Household recipient of benefits, household is rented, social class of head of household	Mental health problems (SDQ)[1]	McMunn et al. *(31)*
Parents' labour market participation	Children's well-being	Pedersen et al. *(32)*
Parental occupation and family affluence	Psychological health	Richter *(33)*
Neighbourhood socioeconomic deprivation	Health-related quality of life (HRQOL)	Drukker et al. *(34)*
Neighbourhood socioeconomic deprivation	Behavioural problems	Schneiders et al. *(35)*

The following nine selected studies provide an illustration of the diversity of research approaches adopted and describe the general direction of results.

Data from the *Health survey for England 1997* showed a graded association between household income and the frequency of children's emotional and behavioural problems *(30)*. Socioeconomic indicators such as living in a household that receives benefits or living in rented accommodation (and not in a self-owned house) as well as the social class of the head of household also proved to be significant influences on children's mental health *(31)*.

A study covering Denmark, Finland, Norway and Sweden *(32)* defined socioeconomic status according to parental occupation, with the higher-ranking parent determining the family's social class. Comparing data from 1984 and 1996, the researchers found increasing social inequality in children's well-being in Scandinavian countries, with the exception of Denmark. A higher percentage of children from families without paid work reported low well-being in the data from 1996.

It was found in the German sample of the HBSC study that while family affluence was significantly associated with mental health, parental occupational status was not *(33)*. Drukker et al. *(34)* found that neighbourhood income inequality in Maastricht, the Netherlands, was not associated with (mental) health-related quality of life outcomes in families, but that neighbourhood socioeconomic deprivation had a negative impact. Their results demonstrated the influence of absolute neighbourhood deprivation and lack of influence of neighbourhood inequality, leading them to conclude that the relative income hypothesis does not work at neighbourhood level.

Schneiders et al. *(35)* found similar results in Rotterdam, the Netherlands, where growing up in a disadvantaged neighbourhood (in terms of unemployment, instability, average income and high numbers of recipients of welfare benefits) was associated with increased behavioural and emotional problems, even after adjustment for individual variables. Parents' education and occupation were also found to be connected to children's behavioural and emotional outcomes.

A Slovak study *(36)* showed that adolescents with lower socioeconomic status determined on the basis of parental occupational group and type of school attended achieved significantly lower scores in mental health; however, socioeconomic differences in psychological health were not found.

It becomes apparent in some studies that detection of the presence of socioeconomic inequalities is dependent on the indicator. A study from the United Kingdom, for instance, was unable to find an influence of socioeconomic status on adolescents' mental health when based on parental characteristics such as occupation, education and residential neighbourhood, but provided some evidence for mental health inequalities when respondents' social position in terms of economic activity status was considered *(37)*.

[1] Strengths and Difficulties Questionnaire.

Evidence supporting the association between socioeconomic status and mental health in children and adolescents comes not only from European studies; there is also a large body of evidence from the United States. The US National Longitudinal Study of Youth, for instance, reported that a lower prevalence of depression and emotional disorders was associated with higher socioeconomic status, independent of the definition of socioeconomic status as education or income of the family *(38–40)*.

An extensive review of socioeconomic status and child development *(41)* states that there is "substantial evidence that low-SES children more often manifest symptoms of psychiatric disturbance". Although there is little research on this association among very young children, there is evidence that socioeconomic inequalities in early childhood become more pronounced in middle childhood and adolescence *(41)*.

Evidence exists not only to support the association between socioeconomic status and mental disorders in children and adolescents, but also to emphasize positive mental health and observed socioeconomic inequalities. A study in seven European countries of 1896 children and adolescents showed that higher parental education level and greater family affluence were associated with more positive perceptions and emotions *(42)*.

Mental ill health versus positive mental health

Only research focusing on mental ill health has been considered to this point. A crucial disadvantage of research adopting this approach to children's and adolescents' mental health is that it provides limited information. Despite the reported high prevalence rates, a majority of adolescents do not meet diagnostic criteria for mental ill health. By focusing exclusively on mental ill health, researchers do not acquire information about the positive psychological well-being and mental health of the majority of adolescents. The application of screening instruments focusing on mental disorders results in a separation of adolescents into two groups: those with signs of a disorder, and those without. Further differentiation is not possible because no information on the subjects' position on a mental health continuum is available. The application of a mental health index, in addition to a measure of mental disorders, can give us valuable information on mental health.

Collecting data on positive mental health not only provides valuable information; it also complements the idea behind WHO's definition of health, which states that health is more than the absence of disease and is a "state of complete physical, mental and social well-being" *(43)*. WHO specifically defines mental health as "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" *(44)*. A new approach to data collection that goes beyond the administration of screening instruments for mental disorders is needed.

Two instruments that meet this criterion are used in the HBSC study. The tool used for collecting data on positive mental health is the KIDSCREEN-10 Mental Health Index, developed within the KIDSCREEN project which will be described in the next section. It is included in the "positive health" optional package in HBSC and was applied in 14 countries in the 2005/2006 survey. The SDQ, also part of the "positive health" package, is used to collect information on mental ill health and was administered in seven countries.

Results on mental health and socioeconomic status from the European KIDSCREEN survey

The European KIDSCREEN mental well-being survey

The KIDSCREEN European project took place between 2001 and 2004 in 13 European countries (Austria, the Czech Republic, France, Germany, Greece, Hungary, Ireland, Poland, Spain, Sweden, Switzerland, the Netherlands and the United Kingdom). The project was part of the Quality of life and Management of Living Resources programme and was funded by the European Commission (EC) within the Fifth Framework Programme (EC Grant Number: QLG-CT-2000- 00751) *(45)*.

The aim of the project was to develop a new indicator and to measure well-being and mental health problems in children and adolescents. The KIDSCREEN-10 Mental Health Index was developed simultaneously in the participating countries. It assesses the child's perspective on his or her physical, mental and social well-being, identifies children at risk and suggests suitable early interventions. The survey collected comparable data on physical health, mental health and socioeconomic status in children and adolescents in Europe, estimating the distribution of mental ill health and poor mental well-being.

KIDSCREEN survey data were collected from large population-based samples in each country, including children from the same age range (8–18 years). Distributions within the national samples by age and gender were fairly good and were comparable across countries. The survey used the same sources of information (parents and children), applied the same kind of data collection tool (questionnaires) and administered the same assessment tools in all participating countries *(46)*.

Three different approaches to sample selection were followed. In six countries (Austria, Germany, Switzerland, Spain, France and the Netherlands), address sampling was conducted via computer-assisted telephone interviews. Questionnaires were sent by post to families who agreed by phone to participate. These were completed at home and sent back to the national centres in a prepaid envelope.

In five countries (Greece, Hungary, Ireland, Poland and Sweden), samples were obtained from schools that were representative of the country as a whole in terms of school type (private or public, rural or urban). Pupils completed the questionnaires during class time and took questionnaires home for their parents. Parents were asked to return their completed questionnaire to the appropriate national centre in a prepaid envelope.

The United Kingdom combined telephone and school administration, and the Czech Republic carried out multistage random sampling of communities and households.

The national KIDSCREEN samples haven proven to be representative in each country *(47,48)*.

The SDQ *(49–51)* was used to assess mental ill health. Although it was not developed to facilitate a cross-cultural approach, there are currently 62 language versions available *(52)* and many published international studies have used the instrument *(53–57)*.

The SDQ is a short behavioural screening instrument focusing on emotional and behavioural problems as well as positive behavioural attributes. It includes 25 items which refer to different emotions and behaviours. The SDQ targets mental health problems in four specific problem areas: emotional symptoms, conduct problems, hyperactivity–inattention, and peer problems. It also covers prosocial behaviour of the child.

The "total difficulties" score is based on the 20 items of the first four scales mentioned (the prosocial behaviour scale is not included as it focuses on positive attributes, not problems). The calculated total difficulties score could predict the probability of a psychiatric problem. It is recoded into three categories, assigning each child to one of the following groups:

- "normal"
- "borderline"
- "noticeable mental health problems".

The overall score indicates whether the child is likely to have a significant problem, while the subscales contain an indication of the type of problem.

In contrast to the SDQ, the KIDSCREEN-10 Mental Health Index is a non-clinical measure of mental health status and psychological well-being/quality of life. It does not separate the children into groups according to their burden of mental health problems, but allows measurement along the psychological well-being continuum. It is quite short, consisting of the following 10 items.

- "Have you felt fit and well?"
- "Have you felt full of energy?"
- "Have you felt sad?"
- "Have you felt lonely?"
- "Have you had enough time for yourself?"

- "Have you been able to do the things that you want to do in your free time?"
- "Have your parent(s) treated you fairly?"
- "Have you had fun with your friends?"
- "Have you got on well at school?"
- "Have you been able to pay attention?"

It consequently requires only a few minutes to complete.

The KIDSCREEN-10 Mental Health Index was developed by means of a Rasch analysis which ensured that only those items which represented a global, unidimensional latent trait were included. A better differentiation between the children is made possible by the distribution of the Rasch scores that resemble the expected theoretical normal distribution. The index provides a good discriminatory power and shows only few ceiling or floor effects. The strong internal consistency reliability (Cronbach's Alpha = .82) and test-retest reliability (r = .73) allow precise and stable measurements *(58)*.

The KIDSCREEN survey addressed socioeconomic status by means of the FAS *(59–62)*, an instrument used in the HBSC study since the 1993/1994 survey. The FAS has the advantage of achieving higher response rates than measures of socioeconomic status based on parental occupation, which present several difficulties concerning the reliability of information. The response rate reached 98% in FAS pilot studies.

FAS originally consisted of three items representing indicators of material wealth or deprivation, respectively. As explained by in the preceding background paper by Morgan et al., the questions addressed family car ownership, bedroom sharing and holiday travel. An item on computer ownership was added to increase the scale's discrimination among families with higher socioeconomic status. A composite score is calculated by collapsing scores from these items into a three-point ordinal scale, indicating low, medium and high family affluence.

The FAS has proved to be a valid indicator of children's and adolescents' material circumstances in pilot studies. It is easily understood and has good face validity.

Instruments used in the KIDSCREEN survey overlap with assessment tools from the HBSC study. It will therefore be interesting to compare the following results with data from the HBSC study.

Results on positive and mental ill health in the participating European countries

The mean scores of each country on the KIDSCREEN-10, ordered by the extent of positive mental health of adolescents (analysis adjusted for age), are presented in Fig. 1. The analysis was conducted only for adolescents who had generally lower scores than children in countries that had an overall mean score of 48 with a standard deviation (SD) of 10 (children and adolescents: mean score = 50, SD = 10).

Countries such as the Netherlands, Switzerland and Austria showed high mean scores of positive mental health in children and adolescents, while Greece, Hungary and Poland fell below the European mean. Regarding the variation of positive mental health scores within each country, a look at the standard deviations shows that the smallest variation was found in Poland (SD = 7.7) and the largest in Sweden (SD = 10.1). In general, countries with lower positive mental health mean scores tended to show less variation in mental health scores than those with better positive mental health. The cross-country range of mean KIDSCREEN score equalled a standardized mean difference (SMD) of 0.5 (Netherlands vs. Poland) which can be classified as a clinically meaningful difference.

Fig. 1

Positive mental health according to the KIDSCREEN-10 index mean scores (European overall mean score of adolescents = 48)

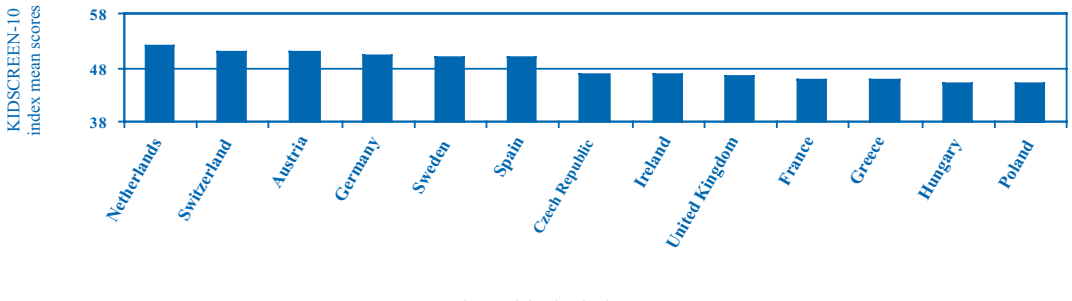


Fig. 2 shows the percentage of respondents with noticeable poor mental health (scoring more than one standard deviation below the European average of children and adolescents aged 8–18 which defines the m = 50 on the KIDSCREEN-10). While the order of countries is similar to that determined by the mean level, these values could be more informative to estimate the magnitude of mental health problems in individual societies.

A comparison of positive mental health in girls and boys for each country shows that in all countries (except France), male adolescents reported statistically significantly better mental health than adolescent girls. A similar trend was found in France, but the result was only close to statistical significance ($p = 0.084$). The effect sizes of these gender differences remained small in all countries and did not exceed the value of 0.5 (Table 2).

In relation to mental ill health according to the SDQ for each country, Fig. 3 shows that the percentage of adolescents with borderline or noticeable scores varied considerably between the countries, ranging from 10% in Germany to 24% in the United Kingdom.

A less clear picture emerges in relation to gender differences for self-reported mental health problems. Table 3 shows the percentage of girls and boys with signs of mental health problems (adolescents with either a "borderline" or "noticeable" score in the SDQ). Girls report more problems than boys in 10 out of 12 countries, but statistical significance was achieved in only three countries. The "w" effect – sizes between 0.06 and 0.12 – could be classified as a small effect.

Gender differences in relation to self-reported mental health problems did not correspond to those in positive mental health. France, for instance, which was the only country without significant gender differences in positive mental health, was among the three countries with significant gender differences in mental health problems. The fact that gender differences are not easy to detect in mental health problems but are consistently apparent in relation to positive mental health emphasizes the importance of this additional indicator.

Association of adolescents' positive and mental ill health and socioeconomic status in 11 European countries

To test for socioeconomic inequalities in adolescents' mental health in different countries, adolescents were divided into the three categories of low, medium, and high FAS. Then the percentage of adolescents with signs of mental health problems according to the SDQ (adolescents with either a "borderline" or "noticeable" score) was calculated in each FAS category.

A significant graded association with higher percentages of young people with mental health problems was found in the lower FAS categories in Spain, the Netherlands, the United Kingdom, Hungary and the Czech Republic. In the United Kingdom, for example, 16% of adolescents with high family affluence showed signs of mental health problems, but the figure rose to 38% in those with low family affluence. In Spain, 9% of students with high family affluence were affected by mental health problems, 15% in the middle FAS category and 23% in low FAS.

Fig. 2

Percentage of respondents with poor mental health according to the KIDSCREEN-10 index

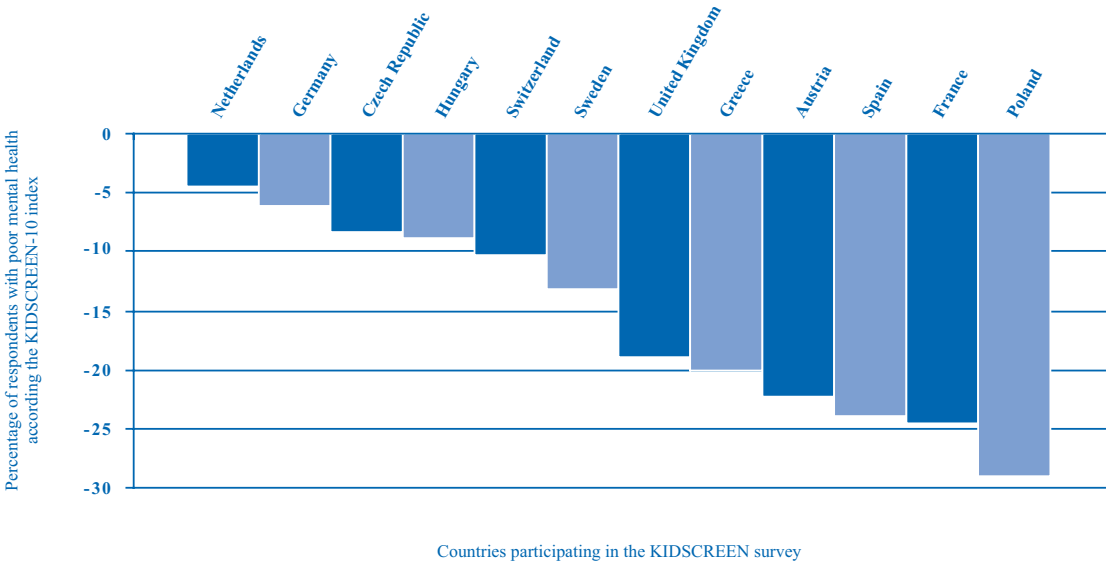


Table 2

Positive mental health (KIDSCREEN-10) in different countries according to gender

Country	Girls m(SD)	Boys m(SD)	Effect (d)
Austria** (n=878)	49.6 (8.9)	52.6 (9.4)	0.3
Czech Republic** (n=1 016)	45.0 (7.1)	47.3 (7.8)	0.3
France (n=622)	45.0 (8.4)	46.1 (8.0)	Ns
Germany** (n=1 079)	49.3 (8.4)	51.0 (8.4)	0.2
Greece** (n=1 146)	44.2 (7.6)	47.2 (8.0)	0.4
Hungary** (n=1 839)	43.6 (7.6)	46.2 (8.9)	0.3
Ireland** (n=894)	45.5 (7.9)	48.1 (7.6)	0.3
Netherlands** (n=1 168)	50.2 (8.2)	53.6 (10.0)	0.4
Poland* (n=1 120)	43.9 (7.9)	45.3 (7.3)	0.2
Spain* (n=522)	48.4 (9.6)	50.9 (8.7)	0.3
Sweden** (n=3 097)	49.2 (10.0)	52.4 (10.0)	0.3
Switzerland** (n=1 078)	49.6 (8.0)	52.6 (8.5)	0.4
United Kingdom** (n=883)	45.5 (8.3)	47.8 (8.5)	0.3

* p<.01
** p<.001
m = mean
d = Cohen's d, measure for effect size. Effects size was calculated by dividing the mean difference by the overall SD
Ns = not significant

Fig. 3

Mental ill health: percentage of borderline and noticeable scores in SDQ self-report

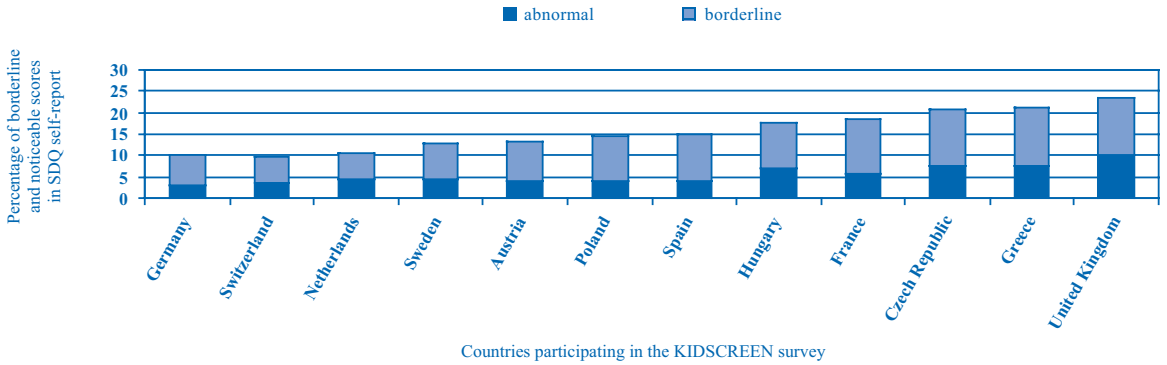


Table 3

Mental health problems in different countries according to gender

Country	Girls	Boys	Effect (w)[a]
Austria (n=942)	13.9%	12.5%	Ns
Czech Republic (n=1 026)	22.9%	18.7%	Ns
France* (n=320)	22.7%	13.2%	0.12
Germany* (n=1 077)	11.7%	8.2%	0.06
Greece (n=1 147)	21.9%	20.1%	Ns
Hungary* (n=1 841)	19.6%	15.1%	0.06
Netherlands (n=1 216)	11.7%	9.1%	Ns
Poland (n=1 034)	14.3%	15.2%	Ns
Spain (n=542)	14.4%	15.8%	Ns
Sweden (n=3 264)	13.9%	12.1%	Ns
Switzerland (n=543)	11.0%	8.7%	Ns
United Kingdom (n=626)	24.9%	22.4%	Ns

[a] effects size "w"
* $p<.05$
Ns not significant
n number of subjects in the sample

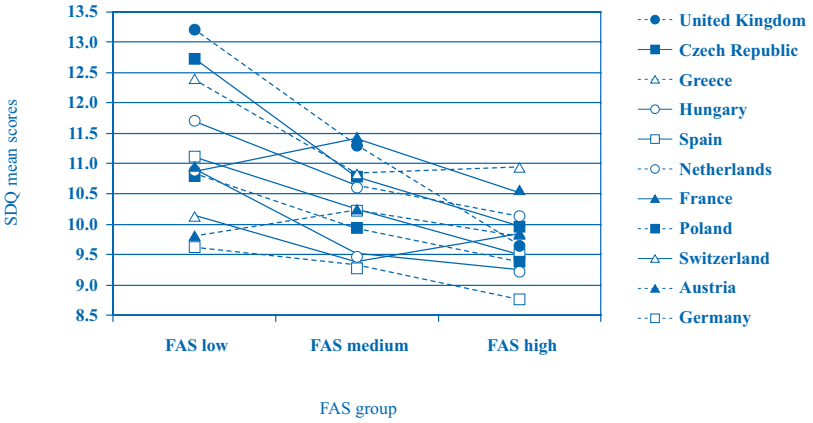
In Germany, Greece and Poland, a $\chi 2$ square test over the three FAS categories did not reach statistical significance. Small but significant correlations (rs around .12) were found between the FAS total score and the total difficulties score of the SDQ, with lower family affluence being associated with a higher mental health problem score. In three countries (Austria, France and Switzerland), no association between socioeconomic status and mental health problems was found.

Fig. 4 illustrates the association between socioeconomic status according to the FAS category and mental health problems according to the self-reported total difficulties score in the SDQ.

In summary, lower family affluence was significantly associated with more child and adolescent mental health problems in 8 of the 11 countries, while no association was detected in 3 countries. It must be recognized, however, that the different countries included in the analysis had different standards of living. Consequently, the percentage of adolescents in the three FAS categories varied widely.

Fig. 4

Association between family affluence and adolescent mental health problems (SDQ score)



For example in the Czech Republic, Poland and Greece, between 38% and 49% of the respondents were assigned to the low FAS category, while in France, the Netherlands and Switzerland, the equivalent figures ranged between 8% and 11%. Against this background, the question arises as to how far living in low family affluence in a poorer country might feel differently from doing so in a better-off country. On the one hand, having low family affluence might be especially hard in a rich country where only few peers are living in similar deprivation. On the other hand, however, it has to be taken into account that families in the low FAS category from poorer countries also enjoy considerably less material wealth than families in the low FAS category from richer countries.

As was mentioned above, the low FAS category collapses FAS scores from 0 to 3 points. While, for example, 6% of the children in the low FAS category in the Czech Republic receive the lowest possible score of 0 points, and only 47% of these children receive the highest possible low FAS score (3 points), not one child in the sample obtained in Switzerland had the lowest possible score (0 points), and 82% of the children with low FAS received the highest possible score (3 points) within the low FAS category.

These differences in the degree of deprivation within the low FAS category might account to some extent for the finding that the countries without an association between mental health problems and SES were all quite well-off countries, where low family affluence on average indicates a less-severe degree of deprivation.

The same expected association exists in relation to adolescent positive mental health. Fig. 5 shows the positive mental health index mean scores of adolescents with low, medium and high affluence of each country. A statistically significant association between the FAS and positive mental health for almost all countries is apparent.

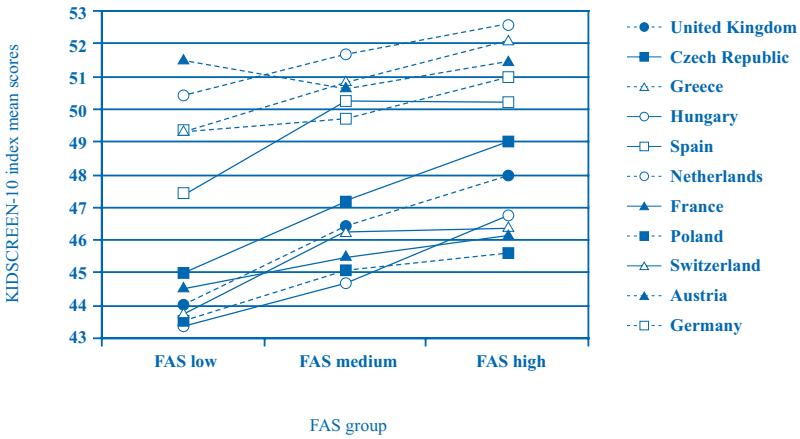
If the mean scores on the KIDSCREEN-10 index for the three groups are compared according to their family affluence, the result is that lower FAS groups report lower positive mental health in 8 out of 11 countries (Germany, Spain, the United Kingdom, Switzerland, Hungary, Greece, the Czech Republic and Poland). If the correlations between the FAS score and the mental health index are calculated, higher family affluence was significantly correlated with better mental health in 9 out of 11 countries (an additional correlation appears in the Netherlands). No association between family affluence and positive mental health can be observed only in France and Austria.

Macro dimension: mental health data and socioeconomic data

FAS scores varied considerably across different countries. The association between the percentage of adolescents reporting low family affluence in a country and the mean mental health index of adolescents in each country is now considered.

Fig. 5

Adolescent positive mental health (KIDSCREEN-10) and FAS in the participating countries



The ordinate axis in Fig. 6 shows the percentage of adolescents reporting low affluence, while the mean positive mental health score of the country is given on the axis of abscissa. It can be seen that in countries such as the United Kingdom, France and Ireland, the reported deprivation is not high, but the mental health index is nevertheless below the average of the 13 European countries.

At the same time, however, a group of countries can be seen on the right side of the figure that have higher country mean scores for positive mental health than the average of the included European countries (m = 48.2; SD = 9.2). Interestingly, none of these countries with higher mental health score means (Sweden, Germany, Switzerland, Austria, Spain and the Netherlands) has more than 25% of children reporting low family affluence. The countries with greater proportions of children with low FAS (Poland, Hungary, Greece and the Czech Republic) are all found in the group of countries with lower mental health scores.

It is not only the level of deprivation – as presented above – that is of interest in relation to the macro dimension of the association between mental health and socioeconomic indicators. Another interesting indicator that is considered in diverse studies on the topic is the extent of socioeconomic inequality.

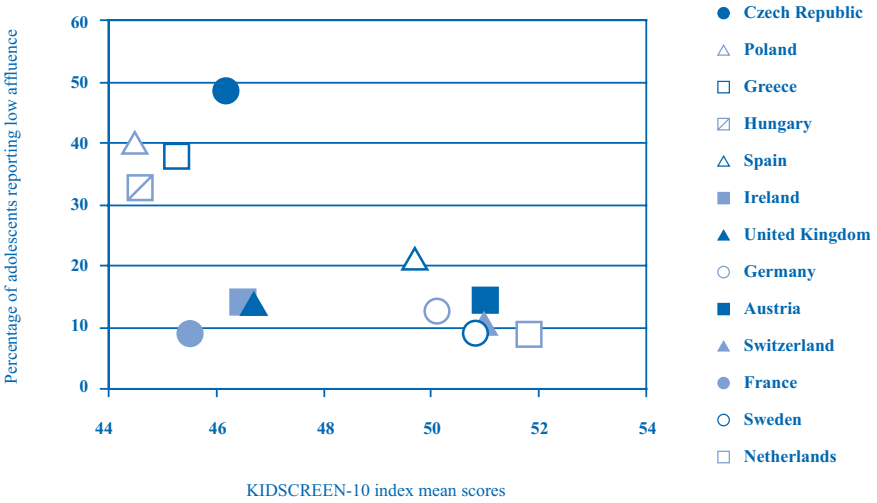
The Gini Index was used as a measure of socioeconomic inequality. This coefficient is a measure of income inequality as described in the United Nations Development Programme *Human development report 2006 (63)*. A Gini Index of "0" represents perfect economic equality and "100" perfect inequality. In Fig. 7, the ordinate axis indicates the Gini coefficient and positive mental health scores are again given on the axis of abscissa.At first glance, two groups of countries (those with lower positive mental health scores on the left side and those with higher scores on the right) can be observed. The range of Gini coefficients in both groups is similar, but a closer look reveals that in countries with lower mental health mean scores, more countries (the United Kingdom, Poland, Greece, Ireland and France) have higher Gini coefficients, indicating higher income inequality. Only in two countries (Hungary and the Czech Republic) is higher income equality and lower mental health observed. Most of the countries with higher positive mental health (on the right side) have Gini coefficients lower than 32, indicating higher income equality.

Summary, conclusions and ongoing issues

Child and adolescent mental health problems are highly prevalent throughout Europe, with epidemiological studies from different European countries demonstrating high prevalence rates. Mental health in terms of positive well-being has been considered a less-important focus for research for some time but is capable of generating important additional information which facilitates further discrimination between respondents.

Fig. 6

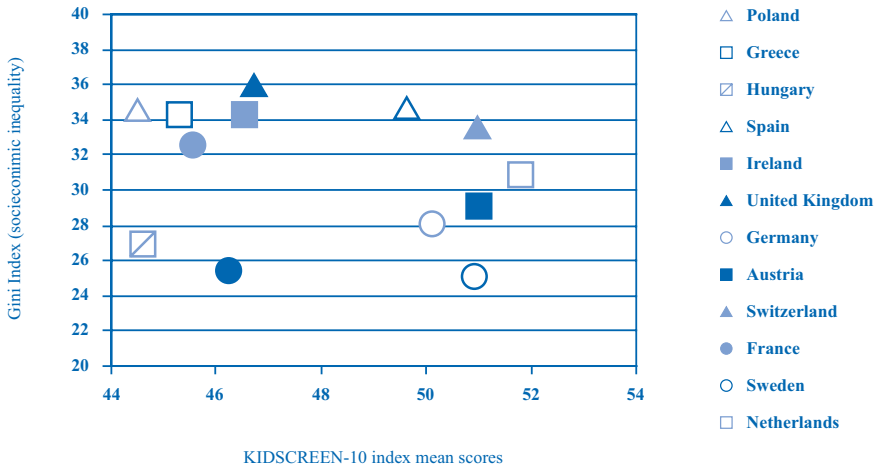
Percentage of young people aged 12–18 years reporting low FAS and their mental health status



(As no FAS data were available from Sweden, data from UNICEF 2007 were used to determine the level of deprivation.)

Fig. 7

Income inequality (Gini coefficient) and positive mental health of 12–18-year-olds



Research on socioeconomic inequalities in mental health has shown associations between lower socioeconomic status and impaired mental health. The analysis of the KIDSCREEN data confirmed these findings for child and adolescent mental ill health and for positive mental health.

Different prevalence of mental health problems was found at country level and there were also country differences in the dispersal of mental health problems. The lower the average mental health level, the smaller the dispersal. In-depth research is required to investigate and, if possible, to confirm this trend.

These analyses, based on the categorized FAS, should be interpreted with caution. The different standards of living in European countries mean that a low score in a rich country has a quite different meaning than a low score in a poor country. The relative-income hypothesis states that it is not the absolute level of deprivation but the gap between rich and poor that influences health, and analyses that consider the intracountry distribution of family affluence have to be conducted. This methodological challenge may also explain why only weak associations were found for Germany when the German National Health Survey has confirmed strong connections between mental health and SES, once again emphasizing the importance of taking diverse indicators of SES and mental health into account.

Current data allow reliable conclusions to be drawn for some countries, while no or very limited data are available from other countries. The body of evidence contains very limited information due to problems related to inconsistencies in methods leading to the inability to accurately compare countries. SES is also measured in different ways and is not always considered or reported. Conclusions on socioeconomic status as a special risk factor for mental health are therefore subject (at least) to the same restrictions as conclusions on child and adolescent mental health in general.

Analyses of the KIDSCREEN data show the advantages and potential of comparable survey data. Analysis of international data on mental health and socioeconomic status is highly desirable, and the HBSC survey methodology is well suited to facilitating the task.

There is a need for detailed, comparable, reliable and valid data on both SES and mental health to enable political decision-making to be based on a strong scientific rationale. Such data could form the basis of measures to identify groups with an increased risk of mental health problems, enabling prevention and early intervention mechanisms to be developed. Further research could be also targeted on identifying aspects of social, health and education policy that account for any relationship between SES and child and adolescent mental health on a macro level as well as differences at the micro level.

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