



Ole Rikard Haavet

Adolescents at risk

The impact of contextual and individual factors on health. A study of 10th grade pupils in Oslo, Norway



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A study of 10th grade pupils in Oslo, Norway



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&

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To: Jonas
Silje
Thea
Bente

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1 Opening

Preface: Fifteen minutes ...

Fifteen minute consultations, twenty patients a day, make it easy to miss underlying problems and trends. Some consultations will naturally last longer than fifteen minutes. Nevertheless, I believe that many GPs have come in contact with clinical phenomena that, due to busy schedules, they have a limited possibility to examine in their entirety.

An inordinate number of adolescents with illnesses was one phenomenon that caught my attention as a GP [1, 2]. My impression was that some young people consulted me more frequently than others and seemed to be sick more often without obvious reasons [3].

My starting point was my knowledge of the local community in which my young patients lived. I began to be suspicious that these patients who used my services so often had experienced more negative life experiences than had their healthy peers and I became curious about possible relationships among these negative factors and how they might relate to their illnesses.

As a GP for these young people, I followed them into adulthood, and it seemed that some of them became ill more and more frequently. Numerous treatments for various illnesses in my office and in the hospital did not seem to stop the development of more and more illness. And yet some of these young people actually did manage to break their career as patients.

The picture that began to develop gained clarity with experiences that I obtained as the Director of Health Service and Public Health, first in the local Council of Fet and later in a city ward of Romsås in Oslo. In both these positions, one of my duties was to deliver premises for the planning of healthier environments.

Beginning in 1996, a government grant for general practitioners presented me with the opportunity to take one day a week from my usual responsibilities to explore this field. Even though I was prepared to see my ideas and hypotheses vanish before my eyes, the picture was becoming clearer and clearer, and new grants and more time led to further immersion in the subject.

The result is this treatise, which I hope will provide premises for better health planning and will demonstrate that there are unused possibilities in the meeting between adolescents and professionals. Even in the GPs' fifteen minutes...

Acknowledgements

An inspiring cooperation in Romsås created the foundation for the development of this project from idea to action. In this connection, I want to especially mention my colleague Anne Karen Jenum. At an early stage of exploration in this field, we received a visit from, among others, Professor Per Fugelli and Professor Berthold Grünfeld, who listened to our ideas, and whose contributions were decisive for the start of my study. Professor Grünfeld later became my tutor, until he retired at the beginning of 2003.

Professor Jørund Straand assumed the role of my primary tutor, and has worked with accuracy, knowledge, and persistence. Professor Ola Didrik Saugstad has filled the role of a complementary tutor, with his extensive experience and substantial net of contacts. I am very thankful for their massive support and encouragement throughout the work with this thesis.

Professor Dag Thelle included me in the preparations of The Oslo Health Study (HUBRO), a couple of years before it was decided that it would include a youth section. Later, Director Yngve Haugstvedt and Professor Inger Johanne Søgaard became key figures in the development of this project.

A number of persons have kindly offered their advice. Professor Per Hjortdahl has provided support in many different ways since the early stages of this process. The statisticians Håkon Gjessing and Ingvid Dalen, the latter a co-author of the one of

paper to emerge from these data, have been extremely helpful. I would also like to thank my associates and colleagues at Lillestrøm Legesenter for the generosity I have met throughout the years I have worked on this project.

Thanks to the members of the Norwegian Association of General Practitioners (APLF), the professional development committee, first under the leadership of Svein Steinert, later by Trond Egil Hansen, and the Chairman of APLF, Kjell Maartmaan-Moe, who have seen that the subject “Youth health” is now placed on the agenda. Contributions in this matter were also given from former Chairman of APLF, now president of the Norwegian Medical Association, Hans Kristian Bakke.

Finally, I am grateful to my spouse, Bente, who has given me both unceremonious comments and insightful feedback along the way, and has been indulgent when my days at the office have drawn a bit long. I am also thankful for the support from my three grown children Jonas, Silje and Thea.

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1.1 List of publications

Papers I-IV

Paper I:

Haavet OR, Straand J, Saugstad OD, Grünfeld B. Illness and exposure to negative life experiences in adolescence: two sides of the same coin? A study of 15-year-olds in Oslo, Norway. *Acta Paediatr* 2004; 93; 405-11.

Paper II:

Haavet OR, Straand J, Hjortdahl P, Saugstad OD. Do negative life experiences predict the health-seeking behavior of adolescents? A study of 15- and 16-year-old students in Oslo, Norway. *J Adolesc Health*. In press.

Paper III:

Haavet OR, Saugstad OD, Straand J. Protective factors associated with promoting health in low-risk and a high-risk populations of 15- and 16- year olds in Oslo, Norway. *Acta Paediatr* 2005; 94, 345 - 51.

Paper IV:

Haavet OR, Dalen I, Straand J. Do school and life experiences predict depressive symptoms among the adolescent pupils? A study of 10th grade pupils in Oslo, Norway. Submitted.

1.2 Summary

In this cross-sectional study we have explored the associations between life experiences, ill health, and health care seeking behaviour among 10th grade pupils at Oslo schools in 2000 and 2001. Illness among the adolescents was related to possible risk-reducing factors. Finally, we related depression with self-reported negative life experiences and absence of self-reported positive life experiences.

Negative life experiences and ill-health (Paper I and II)

Adolescents' negative life experiences during the previous year were: heavy pressure to succeed (62%), parents not living together (31%), death of a person close to the respondent (26%), exposure to physical violence (22%), exposure to bullying at school (15%), and sexual violation (4%). Many of the pupils some reported chronic illness: hay fever (38%), eczema (29%), and asthma (13%). Over the previous 12 months, 56% had experienced headache, painful neck or shoulders (35%), sore throat at least three times (15%), lower respiratory tract infection (9%), and mental problems for which help was sought (7%).

There was a strong and gender-specific relationship between illness and other negative life experiences. For boys, the strongest association was with exposure to sexual violation, violence, and bullying. For girls, the strongest correlates of illness were death of a person close to them, heavy pressure to succeed, sexual abuse, and parents who were separated. During the week prior to the survey, 26% of girls and 10% of boys reported that they had experienced symptoms of depression; 53% of the boys and 29% of the girls with depressive symptoms had been exposed to physical violence during the previous year.

Some contacts with primary health care services during the previous year were reported by 71% of respondents, and 6% had seen a mental health professional (a psychologist or psychiatrist) during this time. Those who reported feeling a heavy external pressure to succeed, had more contacts with all primary health care services. Girls, but not boys, who reported being bullied by others, reported more health care

seeking than did their non-bullied peers. Exposure to physical violence was associated with significantly more visits to the School Health Service (SHS), general practitioners (GPs), and emergency medical services, and was related to more than doubled probability of visiting a psychologist or psychiatrist. Health care utilisation was neither correlated with the family's financial situation as reported by the student nor with a parent's unemployment during the previous year.

Positive factors related to good health (Paper III)

The adolescent population was divided into low-risk (LR) and high-risk (HR) groups, and into quartiles, based on the sum-score of various negative life experiences.

Compared with potential risk-reducing factors, the difference between the LR and HR groups was largest for the factor "my family values my opinions", and "I always manage to solve serious problems if I try hard enough". The family valuing the adolescents' opinions was the risk-reducing factor most often associated with lower incidences of illness and health care utilization. Among the adolescents at highest risk, less depression was strongly related to positive relationships with friends. Adolescents reporting that they did manage own problems had about half the risk of depression. The risk-reducing effects increased with increasing risk.

Do school and life experiences predict depressive symptoms among the adolescent pupils? (Paper IV)

The expression "health promoting schools" refers to a strategic program that originated with the World Health Organisation. The goal is to "disseminate models of good practice and make opportunities for health promotion" within schools. From this perspective we wanted to explore differences in the prevalence of depressed pupils in Oslo secondary schools and to examine the relationship between depression and the sum-scores of risk factors both at a school level and an individual level.

The dependent variable in this study was depression, as defined by a positive score on the ten-item Hopkin's Symptom Check List-10 (HSCL-10). The two composite independent variables were: 1) a negative factors (NF), consisting of self-reported

heavy pressure to succeed and exposure to bullying, violence, and sexual violation; and 2) positive factors (PF), comprising respondents' self-reported levels of physical activity, educational aspirations, and parents who valued their opinions. All three variables were made up as summed scores, which were subsequently dichotomised. Presence of NF factors, and absence of PF factors constituted risk.

Within individual schools, the mean prevalence of depression was 9.6 % (range 0% to 19.0%) for boys and 25.6% (3.3% to 39.0%) for girls. The presence of NF varied from 12.3% to 45.5% for boys and from 4.2 % to 38.8 % for girls. Corresponding figures for PF were 2.4 % to 23.1 % for boys and 4.3 % to 37.5 % for girls. In both gender we found significant associations between NF and PF, and depression.

For female pupils, our data support that their school is an independent predictor for depressive symptoms. A similar trend, however not significant, was observed for male pupils. For both genders, the positive and negative factors investigated had significant effects on the odds for a positive depression score.

The proportion of depressed pupils varies greatly among Oslo public schools. This variation is associated with features of the pupils' social context.

1.3 Norwegian summary/Norsk sammendrag

Risikoutsatt ungdom

Virkningen av kontekstuelle og individuelle faktorer på helse. En studie av 10. klassinger i Oslo

I denne tverrsnittsundersøkelsen har vi studert sammenhenger mellom negative livserfaringer, beskyttende faktorer og sykkelighet hos 10. klassinger i Oslo i 2000 og 2001. Sykelighet ble relatert til mulige risikoreduserende faktorer. Til slutt relaterte vi deprimerede elever med selvrapporterte negative og fravær av positive livserfaringer.

Negative livserfaringer og sykkelighet (artikkel I og II)

Blant rapporterte negative livserfaringer siste året var press for å lykkes (62%), foreldre som ikke bor sammen (31%), dødsfall hos nær person (26%), utsatt for vold (22%), mobbing på skolen (15%) og seksuelt overgrep (4%). Et stort antall av elevene hadde kronisk sykdom: høyfeber (38%), eksem (29%), og astma (13%). Rapporterte plager og sykdommer de foregående 12 måneder var: hodepine (56%), smertefull nakke og skuldre (35%), sår hals tre ganger eller mer (15%), bronkitt eller lungebetennelse (9%), og psykiske problem som de hadde søkt hjelp for (7%).

Der var en sterk og kjønnsesifikk sammenheng mellom sykdom og andre negative livserfaringer. For gutter var denne assosiasjonen sterkest til seksuelt overgrep, vold og mobbing, og for jenter var de sterkeste korrelatene til sykdom, dødsfall hos nær person, høyt press for å lykkes, seksuelt overgrep, og foreldre som ikke bor sammen. I løpet av siste uke før spørreundersøkelsen oppga 26% av jentene og 10% av guttene å ha hatt symptomer forenlig med depresjon. 53% av jentene og 29% av guttene med depressive symptomer, hadde vært utsatt for vold.

Kontakt med primærhelsetjenesten siste året ble rapportert av 71% av respondentene, 6% hadde konsultert psykiater eller psykolog. De som rapporterte at de hadde følt høyt press for å lykkes, hadde økt antall konsultasjoner innen alle typer primær-

helsetjenester. Jenter, men ikke gutter, som rapporterte at de ble mobbet, søkte hjelp i helsetjenesten oftere enn de som ikke var utsatt for mobbing. Å være utsatt for vold var assosiert med en signifikant økning i besøk i skolehelsetjenesten, hos allmennlegen og hos vaktlege, og var relatert til mer enn doblett sannsynlighet for å besøke psykolog eller psykiater. Bruk av helsetjenestene var ikke korrelert til familiens økonomiske stilling slik den ble rapportert av studentene, eller med foreldres arbeidsløshet foregående år.

Positive faktorer relatert til god helse (artikkel III)

Ungdomspopulasjonen ble delt i lavrisiko (LR) og høyrisiko (HR) grupper, og i kvartiler, basert på en sum-skår av negative livserfaringer. Sammenlignet med potensielt risikoreduserende faktorer, var forskjellene mellom LR og HR gruppene størst for de mulig risikoreduserende faktorene ”familien verdsetter mine meninger”, og ”jeg klarer å løse vanskelige problemer selv”. At familien verdsetter den unges meninger var den enkeltfaktor som oftest var assosiert med lavere insidens av sykdom og færre besøk i helse tjenesten. Blant ungdommer utsatt for høyest risiko, var mindre depressive symptomer sterkest relatert til gode relasjoner med venner. Ungdom som rapporterte at de klarte å løse vanskelige problemer selv, hadde omkring halvert risikoen for depresjon. Risikoreduserende effekt syntes å øke med økende risiko.

Er depresjon blant unge elever relatert til skole? (artikkel IV)

Uttrykket helsefremmende skoler refererer til et strategisk program som utgår fra Verdens helseorganisasjon og som også Norge har sluttet seg til. Målet er ”å spre modeller for god praksis og gi muligheter for god helse”. På denne bakgrunn ønsket vi å undersøke forskjeller i prevalens av deprimerte 10. klassinger i Oslo og undersøke sammenhengen mellom depresjon og sum-skår av utvalgte risikofaktorer.

Depresjon var den avhengige variabelen i denne studien, definert som en positiv skår på Hopkin’s Symptom Check List-10 (HSCL-10). De to sammensatte, uavhengige variablene var: 1) negative risikofaktorer, NF, som består av selvrapportert press for å lykkes, å være utsatt for mobbing, for vold og for seksuelt overgrep, og 2) positive

risikofaktorer, PF, som omfattet respondentenes selvrapporterte nivå av fysisk aktivitet, utdanningsambisjoner og foreldre som verdsatte deres meninger. Alle tre variablene ble laget som sum-skår, som deretter ble dikotomisert. Tilstedeværelse av NF og fravær av PF faktorene representerte risiko.

Innenfor hver skole var gjennomsnitts prevalens for depresjon hos gutter 9.6% (HSCL-10 test positiv) og varierte mellom skolene fra 0% til 19%. Dette gjennomsnittet var 25.5% med variasjon fra 3.3% til 39% for jenter. Tilstedeværelsen av NF varierte fra 12.3% til 45.5% for gutter og fra 4.2% til 38.8% for jenter. Tilsvarende tall for PF var fra 2.4% til 23.1% for gutter og fra 4.3% til 37.5% for jenter. For begge kjønn fant vi en signifikant assosiasjon mellom NF og PF, og depresjon.

Våre data støtter at for jenter er skoler en uavhengig prediktor for depressive symptomer og for gutter fant vi en tilsvarende trend. For begge kjønn fant vi at de undersøkte positive og negative faktorene hadde en signifikant effekt på odds for positiv depresjons-skår.

Andelen elever med symptomer på depresjon varierer vesentlig mellom skolene i Oslo. Denne variasjonen er assosiert med kjennetegn ved unge elevers sosiale kontekst.

2 Background

2.1 Adolescence

The psychologist G.S. Hall introduced the concept of adolescence in 1904 in his work entitled: “Adolescence: Its psychology and its relation to physiology, anthropology, sociology, sex, crime, religion, and education” [4]. His description of the problems young people face in the transition from childhood to adulthood still is highly relevant today. Hall outlined adolescence as a period of “storm and stress”. Although there is not much scientific evidence to support such forceful view of adolescent life, his work provide a highly relevant backdrop to this thesis made a century later.

More recently, the World Health Organisation (WHO) has used the term “young people” in the publications on youth and adolescents. In a meeting in Stockholm in 1969, WHO focused especially on this age period [5]. The meeting resulted in a report on the mental health of adolescents and young persons. The report also drew attention to the fact that an increasing number of youth experienced social dysfunction. Some years later, Lavik found that a considerable proportion (19.6%) of Oslo’s youth had mental health problems, and he pointed out features of the social context as possible explanations [6].

Adolescence has been conceptualised as comprising three stages – early (10-13 years), middle (14-17 years), and late (18-21 years) [7]. The middle period of adolescence has characteristics that differ from those of the previous and later adolescent periods [7]. Although physical development in adolescence can be described as the period beginning with the appearance of secondary sexual characteristics and terminating with the cessation of somatic growth, the behavioural aspects of this period have become equally important benchmarks [7]. This process characterise the transition from the dependency of a child in one end to independency of the adult in the other. Conflicts are prevalent as adolescents become less interested in their parents and more devoted to their peers [8, 9]. By this stage they have already

undergone the majority of their pubertal changes [9] and body image concerns are concentrated on trying to make their bodies more attractive. Eating disorders may become established during this developmental stage [10, 11]. At no other time is the powerful role of peers more evident, e.g. with involvement in various peer subcultures [7]. The abilities to think abstractly and to reason increase in middle adolescence, along with a new sense of individuality [7]. This period is characterised by feelings of omnipotence and immortality, which often leads to risk-taking behaviour [7]. In legal terms, adolescence overlaps both with the period of childhood and adulthood in most countries.

Previous studies suggest that presenting health complaints are common among adolescents [12], and increase as they grow older [13]. Symptoms seem to be clustered [14, 15] and to have a high degree of stability [16, 17].

Because adolescents are not merely older children or younger adults, knowledge about adolescent health should not be based on extrapolations of research data from other age groups. Yet the relationship between low socioeconomic status and morbidity, for example, has been reported for children [18] and adults [19, 20], but not for adolescents [21]. There is an obvious need for specific research on adolescent health problems [1, 22].

Both the health effects of adverse experiences that adolescents face [23-25] and the relevance of possible protective and moderating qualities may vary over time in rapidly changing society [26-28]. It seems like young people now report higher rates of symptoms and general dissatisfaction with their health [29]. Thus, adolescents' health problems can be viewed as a result of an integrative process, which must be explored at regular intervals. A crucial principle, however, is not the acquisition of just more information, but rather a focus on an appropriate selection of information [28].

2.2 Introduction to the study

The adolescents who responded to our survey belong to a middle period: all students in their 10th grade at Oslo schools, virtually all of whom were 15 or 16 years of age.

This period of adolescence is characterised by vitality and rapid developments, but also by vulnerability [30, 31]. As a young persons dependence's of parents decrease, external influences of peer groups and school increase [4].

An unsuccessful adolescence may have great impact on later adult life [30, 31]. Research data suggesting that both psychological and somatic complaints are highly prevalent in adolescence challenges the assumption that almost all adolescents in western societies enjoy excellent health. In a recent cross-sectional survey in Norway, Haugland and co-workers found that among 15-year olds, 18% reported one or more daily psychological complaints while 14% experienced somatic complaints [15]. In Finland, the prevalence of neck, shoulder, and low back pain among 12-18 year olds has increased significantly during the last decade [29].

2.3 Biopsychosocial model

In 1997 we reviewed relationships between serious life events, chronic family difficulties, and somatic illness in adolescents [1]. Here, we focused on the ways in which healthy children cope with the many social problems they face [1]. Hospitalised children experience about twice as many serious life events as children in healthy environments [25, 32]. It is also known that a myriad of illnesses are related to stress: eczema [33], upper respiratory tract infections [34], asthma [33], ulcerative colitis [35], heart disease in adults [36], juvenile rheumatoid arthritis [37-39], fibromyalgia [40], and juvenile diabetes [41-43]. On the other hand, research on coping among healthy, resilient children at risk has revealed a number of social and interpersonal protective factors [44-52]. On this background we concluded this review

with suggesting a biopsychosocial model as suitable for the purpose of understanding health status and care of adolescents at risk.

The term biopsychosocial model is familiar to most health workers. Vandvik constructed a multidimensional biopsychosocial model to study psychosocial factors in fibromyalgia [40] and juvenile rheumatic disease [39]. Dodge and Pettit [53] supported a biopsychosocial model as best equipped to describe the emergence of chronic problems in adolescents. Kim et al. [54] found reciprocal influences between stressful life events and internalising and externalising problems in young people. Brown [55] reviews his research on depression and also emphasises the importance of giving serious attention to a biopsychosocial perspective.

We used a simplified model as a basis of the approach in this thesis to illustrate the possible impact of contextual and individual factors on health of young people (Figure 1). The various factors include biological, developmental, psychological, and social variables. The model included predisposing, provoking, and moderating factors that may interact at the onset of disease and influence short- and long-term outcomes.

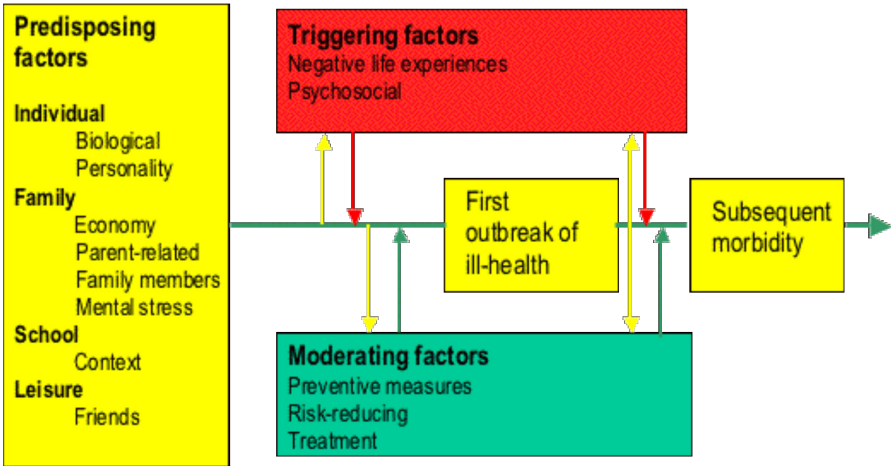


Figure 1. A biopsychosocial model composed of predisposing, triggering and moderating factors and morbidity (illnesses and health-care-services) used as basis of the approach in this survey.

We have emphasised different parts of this biopsychosocial model in the different studies (Figure 1). Both in paper I and II we focused on negative life experiences as triggering factors, with illnesses as dependent variable in paper I, and health-care-seeking behavior in paper II. In paper III, we used negative life experiences as triggering factors creating different risk groups, measuring the possible moderating effect of risk-reducing factors, with selected illnesses and health-care-services as dependent variables. In the last paper (IV), sum-scores of both triggering and moderating factors were nondependent variables, and a sum-score of symptoms of depression was dependent variable.

2.3.1 Negative life experiences and illness

During adolescence, both mental and physical health are influenced by negative life events and experiences like parents' divorce, death of a significant person, exposure to violence, or maltreatment [1, 23, 24]. Both mental and physical symptoms seem to increase with age throughout adolescence, and symptoms and negative life events both tend to be clustered in individuals [15]. Because psychological and somatic illnesses among teenagers are highly correlated, it has been proposed that they to some extent share a common aetiology [15]. In a prospective study of 13- to 16-year-old patients of general practitioners in central London, depression and anxiety disorders were found to be prevalent and often linked to physical symptoms [56]. However, the GPs' recognition of psychiatric morbidity in their young patients was rather poor [56].

2.3.2 Negative life events and health care seeking behaviour

The health care seeking of adolescents may reflect illnesses and "invisible needs" related to various negative life experiences [57] that exceed a young person's capability for psychological readjustment and adaptation. Negative life events are one of the factors that appear to increase GP consultations [58, 59]. Common negative life experiences among young people, such as heavy pressure to succeed, bullying, and exposure to physical violence are positively correlated with increased physical and psychological symptoms and illnesses [60-62]. Among French adolescents, Gasquet

found that young people whose parents did not live together more often turned to professional help for depression [63]. Furthermore, it has been shown that adolescents visiting the GP for depression also have generally higher consultation rates for other reasons [56, 63]. However, some studies suggest that young people meet different kind of barriers in their health care seeking [64-66]. Moreover, Zwaanswijk found that many adolescents do not recognise their own health problems and that the majority of these young people had unmet health needs [67]. Similarly, in a US study, adolescents reporting poor health tended to underutilise health-care-services [66].

Other studies of young people with physical or psychological ill health demonstrate that they may have their needs met by seeking health professionals in primary care [68, 69], particularly their GP [70-73], but little is known about the relationships among common negative life events and young peoples' health care seeking [57].

2.3.3 Positive factors related to reduced illness

In adolescents at risk, it is a challenge for primary health care professionals to find positive factors that have the potential to reduce illness. Unfortunately, positive or risk-reducing factors, have not been well identified or described in the literature, but we believe that they may constitute some of the core elements of resilience [74] – a word that is widely used to describe the ability to modify effects of negative life experiences in relation to psychosocial outcomes [74, 75]. In the resilience literature, researchers most commonly focuses on three levels of young peoples life: the community, the family, and the individual [74].

In one Hawaiian study, 698 babies born in 1955 were followed for 32 years [46, 76, 77]. Approximately 200 of the subjects were defined as being at high risk. Of these, about one-third developed into competent, confident, and caring adults, a result that the authors attributed to the following protective factors: positive school experiences, good relationships with parents, and a general positive state of mind [46, 76, 77]. These results are consistent with those of a Finnish survey, in which the wellbeing of 14- to 16-year-old schoolchildren was explored [78]. More than fifty independent variables addressed their background and school context. Social relations within and

outside school were two of the factors that demonstrated the strongest correlation with a feeling of wellbeing.

A strong relationship with one's family is a powerful positive factor for young people exposed to negative life experiences which could otherwise cause physical and emotional ill-health [79, 80]. Resilient youth probably receive more guidance and supervision from their parents and grow up in better functioning families [81].

A cluster of personality characteristics, skills, and values appears in youth who make a successful adaptation to adult life [46, 76, 82]. Those who perceive themselves as being resilient, feel less lonely and hopeless than do those who perceive themselves as not being resilient [83]. High educational aspirations and regular physical activities are two protective factors identified among high-risk adolescents [81, 84, 85].

Because both health effects caused by adverse experiences and the relevance of possible protective and moderating qualities may vary over time in our rapidly changing society [26, 27, 86], risk-reducing factors related to health must be explored at regular intervals. Therefore primary health professionals and community planners should take advantage of new knowledge about risk-reducing factors on an ongoing basis [26, 52, 87].

2.3.4 Do school and life experiences predict depressive symptoms among the adolescent pupils?

A school is generally acknowledged as being a key setting for promoting health and wellbeing [78, 88, 89], an assumption which forms the basis of the European Network of Health Promoting Schools, organised in 1991 by the World Health Organisation, the Council of Europe, and the European Commission [90, 91]. Their strategy was founded on a social model of health and based on the Ottawa Charter of 1986 [92]. More than 40 countries, including Norway, participate in the European collaboration, with the goal to "disseminate models of good practice and make opportunities for health promotion" in schools [90].

A decade after this program was launched, we wanted to compare depression among adolescent populations in different schools in order to explore the possibility that factors in the school context may account for some of the variation. Depression is also associated with a number of other negative life experiences [62, 93-95], and cumulative adverse experiences may place young people at a particular high risk [96, 97]. In a study comparing two US schools that differed in their level of violence, for example, pupils at the high-prevalence school reported a higher incidence of depression than did members of their cohort at the low-prevalence school [98]. On a more encouraging note, however, depression seems to be influenced by risk-reducing factors [82], thus enabling a positive school environment to reduce depression among adolescents [89]. Knowledge about such differences may be useful for planning local measures to promote good health [12] in high-risk schools [89], for alerting parents, teaching staff [99], and health-care workers [69, 100].

2.4 Aims of the thesis

The general aim of this thesis was to explore the relationship between negative life experiences and complaints and illnesses on one hand, and factors that affect the risk of ill health on the other.

The aims of each paper were:

- 1) to explore associations between self perceived negative life experiences and somatic and psychological symptoms and illnesses among 10th grade pupils
- 2) to investigate negative life experiences as possible predictors for adolescent health-care-seeking
- 3) to identify factors associated with reduced prevalence of illness and use of health care services, and to explore their magnitude in adolescents with relatively low and high number of reported negative life experiences
- 4) to explore differences in the prevalence of depressed 10th grade pupils and to examine the relationships among depression and two sets of risk factors individually and for each school.

3 Method and materials

3.1 Cross-sectional class-room survey

During 2000 and 2001, a classroom survey was conducted among the 10th grade pupils at all lower secondary schools in Oslo as a collaboration between the Norwegian Institute of Public Health (formerly: the National Health Screening of Norway), the University of Oslo, and the Municipality of Oslo.

Prior to the survey, school authorities, school health employees, parents, and pupils were informed about the survey. Parents could withdraw their children from participation by mailing in a return slip. Written informed consent for using the data for research was obtained from all pupils before they completed the questionnaires. Trained field workers visited each classroom and explained to the pupils how to complete the self-administered questionnaire, which then were completed in the same manner as a written exam. Subsequently the field workers gathered all questionnaires.

3.1.1 Questionnaire

The questionnaire was designed by a team of six persons with special interests in the fields of nutrition, oral health, physical activity, sexuality, acculturation, life experiences, and adolescent health; the person representing the last theme was the writer of this document. The items in the main questionnaire were tested in a pilot study and approved by a board which represented the collaboration of Norwegian Institute of Public Health, the University, and the Municipality of Oslo.

The result was a four-page main questionnaire (shown in Appendix). Researchers were given the opportunity of attaching questions of specific interest to their research in a supplementary four-page questionnaire. However, all the variables reported in this study are derived from the items in the main questionnaire.

The questions used in the different papers are given in table 1 with each question numbered with reference to the questionnaire (see Appendix).

Table 1. Questions used in paper; I – IV (P I – PIV)

<i>Num</i>	<i>Question</i>	<i>PI</i>	<i>PII</i>	<i>PIII</i>	<i>PIV</i>
1.2	Have you, or have you had?				
1.2 a	Asthma	X		X	
1.2 b	Hay fever	X			
1.2 c	Eczema	X		X	
	Have you had during the last 12 months:				
1.3 b	Sore (inflamed) throat (≥ 3 times)	X		X	
1.3 c	Bronchitis or pneumonia	X			
1.3 d	Mental disorder for which for you sought help	X	X		
1.5	Have you, in the course of the last twelve months, been troubled several times by pain in:				
1.5 a	Head (Headache, migraine etc.)	X			
1.5 b	Neck/shoulder	X			
3.1	Out of school hours: How many times per week do you take part in sport/ do physical exercise to an extent that you feel out of breath or sweat?				
3.2	About how many hours per week do you spend on this activity			X	X
6.1	HSCL-10	X	X	X	X
6.2	Below are some statements:				
6.2 a	I always manage to solve serious problems if I try hard enough			X	
6.3	Have you in the course of the last 12 months experienced any of the following?				
6.3 a	A parent (supporter) has become unemployed or qualified for disability pension	X	X		
6.3 d	Someone close to you has died	X	X		
6.3 e	Sexual violation (e.g. indecent exposure, pawing, unwilling sexual intercourse etc.)	X	X		X
6.4	Have you experienced any of the following:				
6.4 b	Heavy pressure from others to succeed/to do well at school	X	X	X	X
6.6	Have you, in the course of the last 12 months experienced bullying at school/on the way to school?	X	X	X	X
7.1.	Have you yourself used any of the following services in the past 12 months:				
7.1 a	School Health Service		X	X	
7.1 b	Youth Health clinic		X		
7.1 c	General Practitioner		X	X	
7.1 e	Psychologist or psychiatrist		X	X	
7.1 h	Emergency service		X		
7.1 i	Admission to hospital		X		
8.1	What is the highest education you have considered?			X	X
9.4	May parents are: Married/partners, unmarried and others	X	X	X	
9.6	I think that our family, seen in relation to other families in Norway, has: Poor economy and others	X	X		
10.4	When you think about your family, would you say that:				
10.4 c	My family values my opinions			X	X
10.5	What kind of relationship do you have with your parents?				
10.5 b	My parents know where I am and what I am doing at weekends			X	
10.6	What do you think about your friends, would you say that:				
10.6 b	My friends value my opinions			X	
10.8	Have you yourself been exposed to violence (been hit, kicked or similar) during the last 12 months?	X	X	X	X

3.1.2 Risk factors and risk-reducing factors

The selection of negative life events and risk-reducing factors addressed in the questionnaire were based primarily on a previous review [1] and on the author’s clinical experiences from general practice, and were related to the domains of home, friends, leisure time, and school (Table 1).

3.1.3 Measurements

Illness

Illnesses were selected primarily on the basis of a previous review [1] and on literature indicating that symptoms of depression are associated with negative life experiences [93] and with the individual’s life context [52] (Table 1).

We also included a score instrument for the identification of depression, the Hopkin’s Symptom Check List-10 (HSCL-10) [101] (Table 2).

Table 2. The items of the HSCL - 10 test (Appendix Questionnaire Num 6.1)

Have you in the course of the past week been troubled by feeling:
Sudden fear for no reason
Afraid or anxious
Faint or dizzy
Tense or harassed
Guilty
Sleeplessness
Dejected
Useless, of little worth
That everything is a burden
Hopelessness for the future

The HSCL-10 comprises ten questions regarding different psychological symptoms experienced the previous week. For each question there are four possible answers: from “not troubled” (1 point) to “heavily troubled” (4 points). An average summed score for all ten items (divided by number of questions) of ≥ 1.85 was defined as a positive test, a definition that has recently been shown to be a valid predictor for depression among subjects aged 16-24 years. This cut-off value corresponds to 1.75 in the more comprehensive 25-item questionnaire, HSCL-25 [101].

Health services

Because Norwegians between the age of 16 and 24 years of age have an average of 3.3 contacts per year with a primary care physician [102], students were given the option of checking “none”, “1-3” or “4 or more” as the number of contacts they had the previous year with the various health care services. The term “primary care physician” is used to indicate a GP or after-hours emergency services.

In Norway, the School Health Service (SHS), the Youth Health Clinic (YHC), GP, and physicians on call are all considered parts of the primary care health system. The SHS is usually located at the schools and is staffed part-time with a nurse and to less extent by a physician (usually a GP). The SHS, which operates free of charge, provides immunisations and routine physical screening examinations. In several schools, 10th grade pupils are invited to talk with the school nurse on an individual or group basis about issues of adolescence health.

The main responsibility of the YHCs is to give information about sexuality and sexually transmitted diseases and to provide guidance on contraceptives. Their core staff most often consists of a nurse and a physician (usually a GP). The YHC is open only during afternoons, usually a few hours weekly, and its services are provided free of charge.

In Norway, patients are usually referred to a psychologist or a psychiatrist by a GP and there is a fee for visiting GPs, emergency medical services, and mental health professionals.

East-west considerations

Based on a previous report [18] and study [20], the pupils' home addresses in Oslo were categorised into four areas along the east-west axis, with the outer west being the most wealthy, and inner east having the lowest average income.

3.2 Statistical analyses

3.2.1 Descriptive

Data regarding the two populations of 10th grade pupils gathered during 2000 and 2001 respectively, were pooled and analysed as one cross-sectional study.

The Norwegian Institute of Public Health coded the questionnaires and prepared the data files, which were analysed by SPSS versions 10.0 and 11.0. The multilevel modelling was performed in MLwiN 1.10. During the analysis, we dichotomised items for which there were three or more answer categories.

Prevalences were calculated for each of the variables used in the papers.

In paper III, a predicted probability was calculated as a logarithmic function based on a sum score of four negative life events as covariates and the HSCL-10 score as the dependent variable. The selected negative life events were: “a heavy pressure from others to succeed”, “parents not living together”, “having been bullied”, and “exposure to violence”. The mean probability value was chosen as a cut-off point, differentiating between a low-risk (LR) and a high-risk (HR) group of approximately the same size. In addition, quartiles were calculated to study a possible risk reducing effect with increasing total risk, and based on the same four negative life experiences.

In paper IV, a composite risk variable of negative factors, NF, was created by summing four of the negative life events which were identified in previous reports (paper I and II) as being predictive for illness and health care utilization: pressure to succeed, exposure to bullying, violence, and sexual violation. The resulting composite variable was dichotomised, thereby defining anyone who had experienced at least two of the four risk factors as being at risk or having a positive NF score. A second composite variable of positive factors, PF, was created by three important factors related to less health-care-seeking (paper II) and less illness (paper III), namely self-reported physical activity, educational aspirations, and that the parents valued the opinions of their teenager. The absence of one or more of these factors defined the

respondent as having a positive PF score. The cut-off points for NF and PF, respectively, were chosen so that between 15-30 % of the pupils scored positive on each composite factor.

The distributions of the various factors and mental distress among pupils were evaluated using cross-tabs. Pearson's Chi-square tests were used to decide whether there was a significant variation between different schools in their prevalences of risk and risk-reducing factors and mental distress (paper IV).

Breslow-Day (B-H) statistics were used for testing the homogeneity to explore possible significant differences in risk-reduction when quartiles were calculated to study the risk reducing effect with increased total risk (paper III).

Adjusted binary logistic regression analysis was used for showing the associations among life events, illnesses, and health seeking behaviour (papers I and II). Adjusted binary logistic regression analysis was also used for investigating the associations between riskreducing factors and health-care-seeking behaviour (paper III). Logistic regression modelling was performed, relating the odds of a positive HSCL-10 score to two sets of risk factors (paper IV).

Multilevel modelling was performed (paper IV), relating the odds of a positive HSCL-10 score to the risk factors NF and PF on a individual level and a school level, where the estimation procedure was 2nd order penalized quasi-likelihood Restricted Iterative Generalized Least Squares (RIGLS).

A p value of ≤ 0.05 was chosen as the level for determining statistical significance.

3.3 Materials

There were 8 435 10th grade pupils listed as being in the 10th year of schooling in Oslo during the two years of this study. Of those, 31 were unable to complete the questionnaire due to physical or mental disability, and 88 had moved or left school, leaving 8 316 (N) pupils eligible for participation (Table 3). Out of this number, 127

refused to participate and 846 were absent from school on the day of the study and did not return the mailed questionnaire. The last number is little explored in this study, but among others represent all the common reasons for pupils at this age to be away from school one or a few days. Thus 7 329 (n) pupils completed the questionnaire, representing a participation rate of 88.3%. Missing data due to incomplete questionnaires were minimal – between 1% and 2.5% for items concerning life experiences and between 3.6 and 7.7% for items concerning illnesses.

Included in the school study (paper IV) were the 46 ordinary public schools with average 163 pupils (range 56 – 385), and with a total of 7505 (N) pupils (3802 boys, 3684 girls, 19 with missing data regarding gender) (Table 3). Missing data occurred through omissions on the HSCL-10 test (3.3%), NF (3.4%), and PF (5.3%).

Table 3. Number of schools, pupils eligible for participation (N), and pupils who completed the questionnaire (n)

Paper	Number of schools	N	n
I - III	62/60 ¹	8316	7329
IV	46	7505	6551

¹ In 2000 and 2001, respectively

Among the 10th grade pupils in Oslo who completed the questionnaire in either 2000 or 2001, 80% were recruited to the schools on the basis of geographical criteria, primarily from the local city ward; and 20% were enrolled in their schools independent of residence.

3.4 Ethics

The study protocol was placed before The Regional Ethics Committee and approved by the Norwegian Data Inspectorate.

4 Results

4.1 Summary of Papers I-IV

4.1.1 Paper I: Illness and exposure to negative life experiences

In our study all the adolescents reported some health problems, and every illness was more frequent among girls. The most common chronic illnesses were hay fever and eczema, both of which were reported by approximately one-third of the youth. The most frequently reported illness during the previous year was headache, reported by more than one-half of the adolescents; followed by neck or shoulder pain, reported by every third pupil. One in four girls, one in ten boys, and all 440 pupils who had sought professional help for mental problems the previous year, tested positive on the HSCL-10 screener for depression.

Every adolescent reported some negative life experiences. Two out of three felt a heavy pressure from others to succeed, and one-third perceived their family as being poor relative to other Norwegian families. Regarding life events that had occurred during the previous year, one out of four reported that a person close to them had died and one-fifth had been exposed to some physical violence (male-to-female ratio = 2:1). Of the 22% who had been exposed to violence, 18% reported that adults were responsible for the violence.

The two events most commonly associated with reported illness in boys were exposure to violence followed by exposure to bullying. For girls, the corresponding events were the death of a person close to them, a heavy pressure to succeed, sexual abuse, and parents not living together.

For those who had encountered some help for mental problems during the previous year, between 51% (boys) and 31% (girls) had been exposed to physical violence

during the same period. Among those who reported depressive symptoms during the previous week, a substantial proportion (53% of boys and 29% of girls) had experienced violence during the previous year, and most of them (82%) also felt a heavy pressure to succeed. Furthermore, the experience of physical violence was significantly related to an increased occurrence of all the illnesses mentioned by boys, and with most of the illnesses among girls.

Among girls, 6% had experienced sexual violation during the previous year. Boys exposed to sexual violation (2%) were almost five times as likely as their male peers to suffer some mental problems for which they sought professional help; the corresponding increased probability (odds ratio) among girls was 2.5. Furthermore, a substantial proportion of the sexually violated adolescents (39% of boys and 46% of girls) tested positive at the HSCL-10 screener, and one out of five reported asthmatic illness. All reported illnesses were significantly associated and inter-correlated with self-reported mental health problems requiring professional help, and also with a positive HSCL-10 test score ($p < 0.01$). All 440 adolescents who had encountered some psychological or psychiatric help during the previous year tested HSCL-10 positive.

The prevalence of self-reported illnesses were not influenced by socioeconomic differences as defined by the part of town in which the pupils lived.

4.1.2 Paper II: Do negative life experiences predict health-seeking behaviour?

Some contact with primary health care over the previous year was reported by 71% of the respondents; 4% had visited only one type of health-care-service and approximately two-thirds (59% of boys; 66% of girls $p < 0.01$) had visited a primary-care doctor during the previous year. Among those who had visited the School Health Service during the year prior to the study, 85% of boys and 76% of girls ($p < 0.01$) had also seen a GP. For respondents who consulted the Youth Health Clinic, corresponding figures were 94% and 88% ($p < 0.01$), respectively. Almost all (98%) who had attended a mental health practitioner had also seen a GP during the same period. Among adolescents with a positive HSCL-10 test score, 15% had visited a

mental health practitioner and 66% had seen a GP. A young person experiencing two or more negative life experiences, had significantly more GP-visits and hospital admissions.

Violence had been experienced by 1016 (28%) of the boys and 581 (16%) of the girls. This negative life experience was associated with increased use of almost all listed health services. Visits to the School Health Service were positively correlated with exposure to violence, with ORs ranging from 1.6 (boys) to 2.7 (girls). Corresponding ORs for those who visited a mental health practitioner were 2.2 and 2.3, respectively. Being bullied on way to or at school (reported by 541 boys and 518 girls) was associated with increased health-care seeking only in girls, who reported more frequent use of School Health Services and mental health care. Students who had been sexually violated (boys = 65; girls = 277) utilized all the health care services more often, and this was particularly the case for boys.

Students who felt a strong pressure from others to succeed (62%) had increased number of encounters with all primary health care services. Both boys (847) and girls (999) who reported the death of a close person, visited GPs more frequently. Health care utilization did not correlate with family's unfavourable financial situation as reported by the student (boys = 1019; girls = 1258) or with a parent's unemployment (boys = 253; girls = 325).

Among those who visited a primary-care doctor four or more times per year, the prevalence ratio was 0.5 (GP and emergency services 169/311, School Health Service 56/103) between those who said that they did seek help for mental problems and those with a positive HSCL-10 test score. The corresponding prevalence ratio for frequent mental health care visitors was 1.2 (125/108).

4.1.3 Paper III: Positive factors associated with good health

The adolescent population was divided into a low-risk [LR] and a high-risk [HR] group, and into quartiles, based on a sum-score of different negative life experiences. The groups were compared with respect to potential risk-reducing factors.

Risk-reducing factors

All the reported potential risk-reducing factors except considering a high education were significantly more prevalent in the LR than in the HR group. This difference between the two groups was largest for the risk-reducing factor “my family values my opinion” (LR = 92%; HR = 82%), and “parents know where I am and what they I am doing in weekends” (LR = 89%; HR = 82%). The difference between LR and HR groups was less pronounced for those who regularly participated in sports (LR = 91%; HR = 89%) and those with aspirations for higher education (LR = 56%; HR = 54%).

The number of significant correlations did not differ between the LR and HR groups. Those respondents who believed that their opinions were valued by their family and those who were planning a higher education had the lowest incidences of illness and health care seeking behaviour. Exploring the quartile groups with respect to depression, we found significant correlations for most risk-reducing factors between the two quartiles in the middle of the range. “Family values my opinions” was associated with less depression in the three quartiles (0 – 75%), while “friends values my opinion” had strongest impact in the quartile with highest total risk.

Self-reported physical activity was inter-correlated (boys 93-94% overlap, girls 89-90% overlap) with positive answers to statements about the respondent’s a) ability to solve difficult problems, b) plans for higher education, c) family valuing his/her opinion, and d) friends valuing his/her opinion.

Illnesses

Depressive symptoms (a positive HSCL-10 test score) were less frequent in the LR (9%) than in the HR (28%) group, and the differences became even more evident when comparing the quartile groups. Fewer depressive symptoms were positively associated with almost all tested risk-reducing factors.

Boys who were planning to pursue higher education were less likely than their peers to report 3 or more throat infections the previous year, and this finding held for both

LR and HR populations. For both genders, the presence of three or more throat infections was inversely related to a good relationship with parents. For asthma and eczema, the risk-reducing factors were only associated with less disease in the LR population.

Health services

Among girls, less use of SHS was related to having their opinions valued by their family (LR) and with the ability to solve their own problems (HR). For boys, to have their opinions valued by their family was associated with fewer GP visits in the LR group. In the HR group, however, those who planned to pursue higher education reported more GP visits than did their male peers.

Physically active boys in both LR and HR groups were less likely to make use of a mental health professional during the previous year. Within the HR group, boys who intended to pursue higher education and boys whose opinions were valued by their family were less likely to have seen a psychologist or psychiatrist during the previous year. Girls in the LR group were less likely to visit a mental health professional if they believed that their opinions were valued by their family and friends; for girls in the HR group, such visits were less likely to occur only if friends valued their opinions.

4.1.4 Paper IV: Do school and life experiences predict depressive symptoms among the adolescent pupils?

This study incorporated two composite independent variables: 1) a variable of negative factors (NF), consisting of self-reported heavy pressure to succeed and exposure to bullying, violence, and sexual violation; and 2) a second variable of positive factors (PF), comprising respondents' self-reported levels of physical activity, educational aspirations, and parents who valued their opinions. All three variables were created as summed scores, which were then dichotomised. The presence of NF factors and the absence of PF factors constituted risk.

All over prevalence (95 % CI) of depression (i.e. a positive HSCL-10 test) among the pupils was 9.3% (8.3 to 10.3) for boys, and 26% (24.5 to 27.5) for girls.

Corresponding proportions of boys and girls with a positive NF score were 27.1 (25.5 to 28.6) and 23.1% (21.6 to 24.5), and with a positive PF score 13.1 (11.9 to 14.3) and 17.3% (16.0 to 18.6), respectively.

Within individual schools, the mean prevalence of depression was 9.6 % (range 0% to 19.0%) for boys, and 25.6% (from 3.3% to 39.0%) for girls. For boys, Chi squared tests showed significant variations in NF ($p = 0.046$) and PF ($p = 0.016$) between schools. For girls attending different schools, significant variations were found for the prevalences of depression ($p = 0.03$), and positive NF ($p \leq 0.001$), and PF ($p \leq 0.001$) scores. For boys, the trend towards variation in depression between different schools was not significant ($p = 0.19$), but the NF and PF factors both varied significantly ($p \leq 0.001$).

Using logistic regression modelling, we found significant relationships between depression and the risk factors, for both genders. For boys, the odds ratio (95 % CI) for NF was 4.5 (3.5 - 5.8). The odds ratio for PF was 3.1 (2.3 - 4.1). For girls, corresponding figures were 3.5 (2.9 - 4.2) for NF, and 2.1 (1.7 - 2.6) for PF.

Subsequently, the corresponding multilevel logistic regression model was fitted, where both the constant and the effects of the risk factors were allowed to vary at school level. The results of this analysis were almost identical to the ones found by the one-level analysis, both with respect to effect sizes and standard errors. None of the factor effects were found to vary between the different public schools.

5 Discussion

5.1 Main findings

5.1.1 East-west considerations

The prevalence of self-reported mental health was not greatly influenced by socioeconomic differences as defined by the area of Oslo in which the pupils resided [18]. Moreover, neither parental unemployment nor socioeconomic status as reported by the Oslo respondents were essentially related to the adolescents' health status, a finding that is consistent with data from studies in Scotland [21, 103] and England [104]. This result may be explained by the relatively well functioning social support system in these three countries.

5.1.2 Schools' geographical localisation

Among the 20% of pupils attending schools outside their geographic area, symptoms of depression were more prevalent than they were among the 80% of pupils who were schooled in their own area. This factor may even out both the socioeconomic and environmental differences related to place of residence. However, the literature shows a general tendency of equalisation in this age group [104, 105]. In USA, both household income and school income were related to depressive symptoms [106], whereas the family's educational level and socioeconomic status accounted for only 1% of the variation in pupils' general subjective wellbeing in a Finnish study [78]. The schools that the pupils in our survey attended are located in different socioeconomic regions, but the prevalence of depression in schools did not seem to follow the poor-rich east-west axis in Oslo.

5.1.3 Illnesses and negative life experiences

This study substantiates that relatively common negative life experiences in adolescence are significantly correlated with common illnesses, a finding that applies to chronic and episodic, physical and psychological illnesses. Life events over the previous year most commonly associated with illnesses in boys were exposure to violence, followed by being bullied; whereas for girls the death of someone close to them, heavy pressure to succeed, and sexual abuse were all related to illness.

The various negative life events had different levels of impact on the teenagers' health. Highest odds ratios for complaints and illnesses were found for those having experienced physical violence, bullying, and sexual violation and for those who felt a heavy pressure to succeed. That half of our 10th grade boys with symptoms of depression had experienced violence and that four out of five of all depressed adolescents also felt a heavy pressure to succeed, emphasises the relationship between life experiences and depressive illness. Hence, negative life experiences and illnesses may be two sides of the same coin.

5.1.4 Health-care-seeking behaviour

This study confirms that in adolescence, negative life experiences are closely related to increased use of health services. Among 10th grade students exposed to physical violence and sexual violation, the use of all health care services were greater than for those of their peers. In addition, young people who experienced heavy pressure to succeed or who had experienced death of a close person, more commonly went to see primary-care physician. Experiencing two or more negative life experiences were significantly associated with more GP-visits and hospital admissions.

5.1.5 Risk and risk-reduction

Family-related qualities such as a family that valued the young person's opinions and a motivation for higher education were the risk-reducing factors most often associated

with lower incidences of illness and health care utilisation. The number of associated risk-reducing factors was lower in the HR group than in the LR group. However, positive effects of risk-reducing factors seemed to increase with increasing risk.

5.1.6 Prevalence of depression and features of social context in schools

For female pupils, our data support that their school is an independent predictor for depressive symptoms, regardless of the positive and negative factors investigated. A similar trend, however not significant, was observed for male pupils. In some schools, more than one in three pupils tested HSCL-10 positive, in contrast to schools at the other end of the scale, where only one in twenty pupils was depressed. This variation was associated with features of the pupils' social context. For both genders, both sets of risk factors appeared to have significant effects on the probability of receiving a positive HSCL-10 score for depression, and these relationships were consistent among schools.

5.2 Method and study design

5.2.1 Cross-sectional study and criteria for assessing associations

As this was a cross-sectional study, we cannot conclude, that the disclosed associations represent causal relationships. The long-standing leader of The British Research Council, Sir Bradford Hill, has provided some criteria for distinguish between chance associations and causal relationships [107], and the Bradford Hill criteria are nearly met in this study [107].

- The associations are statistically significant.
- Similar relationships have been found in other studies with different methodologies – the relationship between negative life events and mental distress [108], and for the factors predicting better social adaptation among healthy, resilient adolescents at risk, as found in the resilience research [46, 74, 76, 77].

- A demand of chronological relation between exposition and illness was in some degree met, as we do have some notion of succession between the risk factor items and the HSCL-10 test for depression (see 5.2.2).
- A “dose response effect” is demonstrated by the fact that negative life experiences with known high impact, like sexual violation and violence, had stronger associations than did experiences with less impact, like perceived heavy pressure to succeed.
- A biological acceptable relation also are met, as it is known that psychological stress can influence such variables as immunologic responses [109, 110, 111], a finding which may partly explain the biological basis of the significant associations between negative life experiences and somatic illnesses like eczema, hay fever, asthma, and respiratory tract infections.

The satisfaction of these criteria suggests that the link between risk factors on the one hand and increased illness and health-seeking behaviour on the other, is a valid link.

5.2.2 Chronological order of HSCL-10 and experiences

Although the associations do not tell us if the risk factors preceded depression or the other way around, there is a suggestion of chronological order in the fact that the HSCL-10 asks respondents to report their symptoms during the previous week but that the risk factor questions are related either to experiences during the previous year or to experiences that are not anchored in time, paper I-IV.

5.2.3 Confounding

There may also be such confounding factors as lifestyle of the victim and environmental factors [54]. The student’s report of a relatively poor financial situation in the family or a parent (supporter) becoming unemployed or qualifying for disability pension over the past year may be linked to an unhealthy lifestyle [112, 113]. The adolescent’s perception of the family’s finances were, however, found to have only minor or no effect on illness and health-care-seeking in our study (paper I and II), which is consistent with earlier studies in the Nordic countries [58, 114, 115].

5.2.4 Questions in the questionnaire

There are other issues that could have been addressed in the questionnaire [116]: questions about risk and risk-reduction beyond those already asked, for example, and about reasons for the health-care-seeking behaviour. Some of the questions also maybe ought to be more precise. The study could have benefited from a post-survey questionnaire in which respondents were asked such questions as “Did you find it difficult to remember what has happened to you during the past 12 months?”

5.2.5 Validity and reliability

Almost complete data sets for a total population of about 8000 10th grade pupils in Oslo implies that our findings are representative for Oslo in particular and probably also for other urban settings in comparable countries [115].

Santelli has shown that adolescents can be an accurate source of health care service data [117], and indeed there were few missing data for any of the questions in our study. This suggests that the pupils understood the questions well, which contributes to the internal validity of the study.

5.3 Measuring adolescents’ risk and risk-reducing factors

5.3.1 Risk factors

The various negative life events had different levels of impact on the teenagers’ health. Highest odds ratios for complaints and illnesses were found for those having experienced physical violence, bullying, and sexual violation and for those who felt a heavy pressure to succeed. That half the 10th grade boys with symptoms of depression had experienced violence and that four out of five of all the depressed adolescents in

this study felt a heavy pressure to succeed, emphasises the relationship between life experiences and depressive illness.

Violence and sexual violation were the two experiences most strongly associated with use of the health care system. One possible explanation may lie in the immediate physical and psychological needs of these students, which may also explain their disproportionately high admission rates to hospitals. This finding is in line with the results of Kashani [32], who more than twenty years ago found that hospitalised children between 7 and 12 years of age had experienced significantly more negative life events than children in the general population. This phenomenon may reflect both the vulnerability of young people and the seriousness of these negative life events. There are probably many barriers to their health care seeking behaviour, not the least of which are finances and fear of appearing inappropriate [65].

That boys exposed to violence or sexual violation used health care more than their peers contrasts the general trend of boys being minor health-care-seekers [118, 119]. Of particular note is the fact that sexual violation seems to have a greater impact on the health-seeking behaviour of boys than of girls. The explanation may lie in gender differences in the symptoms of boys and girls reporting sexual assault [120].

Sexually violated boys were almost four times as likely as their peers to report use of SHS. Yet although victims of sexual abuse require time both to disclose and to handle their victimisation [121], few of these adolescents visited the SHS four times or more. Furthermore, we have no way of knowing from our data how many of these young males actually reported the sexual abuse during any of their SHS visits.

There were a large number of students reporting that they felt heavy pressure to succeed and to do well in school. Those who said that they felt such pressure also more likely visited health-care-services during the previous year. Although Street has found that happiness which is dependent on achievements is often related to depression [122], we found no such effect among either the boys or the girls in this study: those who felt heavy pressure to succeed were no more likely than their peers to visit a mental health professional.

It may be surprising that one-quarter of our respondents reported the death of a person close to them during the previous year. A positive answer to this question could, however, partly reflect how adolescents interpret the term “close” person. The questionnaire also included an open-ended question regarding experienced grief. This material is currently under analysis by other researchers (Cecilie Daae, personal communication).

There was no relationship in this study between boys’ health care seeking and whether their parents lived together or apart. Perhaps separated and divorced parents are such a common occurrence that these students felt little stigmatisation, and perhaps they were receiving sufficient support from other people and through public social arrangements to help overcome any problems they did experience.

Girls, however, whose parents were not living together did make greater use of YHC which is consistent with studies that have shown an association between living with a single parent and mental illness [94]. Gasquet has also found that young people in this situation more often seek help for depression [63]. Thus, one explanation for our findings may be that adolescents’ problems related to parents’ divorce are not recognised as health problems [56, 123, 124]. It is also possible that girls living with a single parent, because they tend to be more sexually active than their peers living with two parents [125], may be more likely to consult the YHC for sexuality and contraception counselling.

The answers to the questions concerning a perceived heavy pressure to succeed, bullying, and perceptions about the family’s financial situation were dichotomised, such that “no problem” was defined as “no” and “infrequent” was defined as “yes”. The “yes” category may therefore include problems of less magnitude, which may explain the relatively low odds ratios found for associations between these experiences and various illnesses. Within a 12-month retrospective period, both significant events and illnesses may slip the memory. Experiences occurring before this period may also have influenced the adolescent’s health.

One might ask if the chosen risk factors really characterise a significant portion of the risk for ill health during adolescence. Even supposing that the factors shown represent

a substantial risk, the chosen factors obviously do not represent the total risk. Among the factors not addressed in this study are lifestyle [112, 113, 126] schoolwork stressors, friendship problems [93], pupils' wellbeing in the classroom, curriculum, the school-community interface [97], and collaboration between school and parents [89]. As shown in the present text, the risk factors are strongly associated with illness and health-seeking behaviour, and with the amount of mental distress in each school.

5.3.2 Risk-reducing factors

The results regarding associations between the risk-reducing factors and the dependent variables (incidence of illness and health care seeking), seemed to confirm one another. Those adolescents who experienced more risk-reducing factors were those least likely to exhibit depression as measured by the HSCL-10 test and to use the services of a psychologist or psychiatrist. A supporting family was associated with less depression when risk was low or moderate, whereas good relationship with friends seem to be more important for those at highest risk. Those adolescents who experienced good relationships with friends had fewer depressive symptoms and made less use of psychological therapy, perhaps reflecting the fact that isolation represents both a symptom and a decisive factor for mental illness or other ill health.

That physically active boys had less use of psychological health care both in LR and HR groups corresponds with the finding that physical active adolescents are less depressed [84], but our results seem to indicate a special effect in boys.

Lower incidence of asthma and eczema were associated only with risk reductions in the LR group. This may point to a lower impact of this kind of risk-reducing factors on asthma and eczema in the HR group.

Unexpectedly, HR boys planning to pursue higher education visited GPs more frequently than did the average adolescent in the study. One hypothesis may be that they have greater understanding of their own health needs and a greater capacity to seek help when feeling that their health is threatened.

Dividing the population into two groups as proxies for high and low risk enabled us to place the potential magnitudes of the different risk-reduction factors into perspective, an approach that has been used in earlier studies [77, 127, 128]. The sizes of the two groups were approximately equal. However, making the HR group this large may level out the differences between risks in each group. However, significantly less risk-reducing factors in the HR group than in the LR group may imply an increased risk-reducing effect. The results from dividing the population in quartiles supported this interpretation.

Because the factors were dichotomised, they received the same weight in the regression model; although they may have different influences in real life. Using a summed score reduced this problem; however, risk factors other than the four negative life events may represent a considerable portion of a person's total risk. This objection should be considered when interpreting this result.

The risk-reducing factors showed high inter-correlation, which may raise questions about the uniqueness of each factor. On the other hand, each risk-reducing factor provided a particular profile with less illness and lower health-seeking behaviour. Although each factor seems to have had its own impact, however, a total effect of the sum of the factors may also be possible.

5.3.3 Psychological and physical complains and illnesses

One in four girls tested HSCL-10 positive or depressed, compared to about one in ten boys. One possible explanation for this pronounced gender difference may be the hypersensitivity of the HSCL-10 test for predicting depression among adolescent girls. Jones and Kafetios have recently used the more comprehensive HSCL-25, among other tests, to screen for mental health problems among 337 school children (13 to 15 years of age) in Bosnia after the war [129]. In a sub-sample ($n = 40$) comprised of high and low test scorers, the test results corresponded well with a qualitative assessment in slightly less than four of five cases.

The HSCL-10 test was earlier found to have similar validity as Symptom Checklist-90 [61], and has recently been validated for older adolescents of both genders and for young adults [101]. That all adolescents who had some professional help for mental problems also tested HSCL-10 positive supports the contention that a positive HSCL-10 test probably is a valid predictor for mental health problems in this age group. The finding that girls more commonly seek help for mental problems than boys do also corresponds well with the HSCL-10 results. A gender difference for depressive illness in adolescence which corresponds well with our results has recently been reported from Canada, Great Britain, and the United States [130].

Almost all the negative life experiences examined in this study were found to be significantly associated with depression (HSCL-10). The large number of positive associations with negative life experiences and the inter-correlation with physical illnesses suggest that a depressive state may represent a common denominator which may be a result of negative life event but which may also make a partial contribution to the aetiology of some other illnesses. Psychological stress may, e.g. influence immunologic responses [110], which may partly explain the significant associations between negative life experiences and somatic illnesses like eczema, hay fever, asthma, and respiratory tract infections.

6 Implications

6.1 Improving resistance and reduce risk.

Individual

Motivation for higher education was the factor most often associated with lower incidences of illness and health care utilisation. A positive attitude towards solving own problems was related to a better health. Physical activity related negatively to depression, especially among boys. Furthermore, good relationships with friends were negatively related to depressive symptoms and to the use of psychological therapy.

Family

Strengthening the family-related qualities, as measured here by the family's value of a young person's opinions, were the risk-reducing factor most often associated with lower incidences of illness and health care utilisation.

School

Fewer negative factors (NF) and more positive factors (PF) are both evidently related to a lower prevalence of depression among pupils, and thus may contribute to promote better health of the pupils at school.

Health-care services

A variation in health-care-seeking can be predicted by negative life experiences. Accordingly, there may be a need in clinical practice to assess adolescents with frequent visits for no other obvious reason for possible negative life experiences.

6.2 A five steps stair

The implications of the findings in this survey may be described as a five-step stair (figure 2).

The first step is for the society to acknowledge the importance of risks and risk-reducing factors for health and to take appropriate measures at this basic level.

The second step could be for the schools to explore the prevalence of pupils with symptoms of depression on a regular basis, and to adopt efforts to decrease risk factors and to increase risk-reducing factors.

The third step is to provide knowledge about diagnosis and therapeutic skills and strategies to the relevant health professionals, to try to stop the development of ill health at an early stage (e.g. BMJ's series ABC of adolescence [131]).

The fourth step could be to emphasise the significance of the family and support the families' use of such simple, yet effective, risk-reducing qualities as listening to the opinions of their young family members.

The last step could be for the adults in the family and at school to foster the adolescents' capabilities to solve problems, make friends, engage in physical activity and to motivate them to seek higher education; without disproportionate pressure.

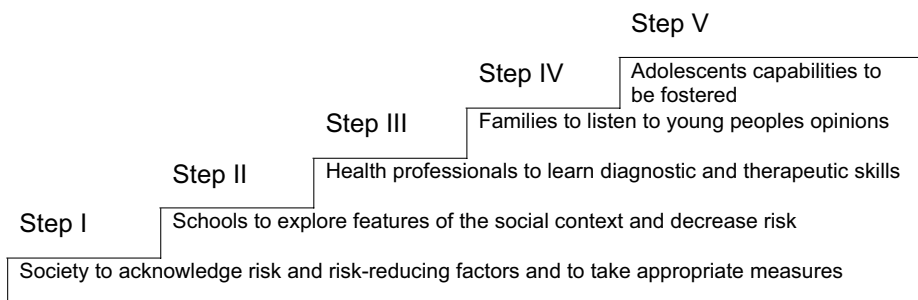


Figure 2. A proposal of a five steps strategy to promote good health in adolescents at risk

7 Concluding remarks

Inordinate high number of adolescents with illnesses was the original phenomenon that caught my attention; numerous treatments for various illnesses did not seem to stop the development of more and more illness in some adolescents, while some of these young people actually did manage to break their career as patients.

Our findings may contribute to a more dynamic understanding of these adolescents' health problems, and thus their prevention and treatment. Knowledge about the impact of various life experiences on adolescent health is a prerequisite for health care professionals such as GPs to better understand and interact therapeutically with their young patients. In clinical encounters with adolescents, it should be a basic rule not merely to ask about the complaints they present, but, for adolescents with many symptoms, to inquire cautiously about relevant background factors as negative life events.

The proportion of pupils with symptoms of depression varies greatly among schools in Oslo. Among the high prevalence schools, there is a need to explore the possibilities of implementing local measures like decreasing risk and increasing positive factors to promote good health. The local school health-services and GPs also need to be involved in the efforts for affected pupils at these schools.

The four aims of this study were reached, but the conclusions are based on associations. We could only argue in favour of the nexus of cause and effect.

7.1 Suggestions for future research

More research is needed to explore the relationships between various negative life experiences and illness in adolescence. The degree to which the relationship between negative life experiences and health care seeking represents appropriate use of the service requires also further research. Furthermore, additional research is needed to establish evidence-based intervention strategies directed towards adolescents at particular risk of ill health. Thus researchers must recognise the importance of risk-reduction, preventive factors, and contextual as well as individual risk. These consistently related variables should be confirmed in other parts of the world and in prospective intervention studies. To identify causal relations if any between risk factors, riskreducing factors and illness is also of importance.

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Errata

Page 35 4th paragraph (and article IV Results 4th line):

95% CI of prevalence of depression for boys (8.3% to 10.3%), girls (23.4% to 27.7%), positive NF boys (25.4% to 29.6%) and girls (21.2% to 25.7%), and positive PF for girls (16.2% to 20.2%)

Page 56 References 12 and 15 are the same

9 Article I

Illness and exposure to negative life experiences in adolescence: two sides of the same coin? A study of 15-year-olds in Oslo, Norway

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Haavet OR, Straand J, Saugstad OD, Grünfeld B. Illness and exposure to negative life experiences in adolescence: two sides of the same coin? A study of 15-year-olds in Oslo, Norway. *Acta Pædiatr* 2004; 93: 405–411. Stockholm. ISSN 0803-5253

Aim: To investigate associations between negative life experiences and common illnesses among adolescents. **Methods:** Cross-sectional questionnaire study carried out at all lower secondary schools (10 grade) in Oslo, Norway, during 2000 and 2001 ($n = 8316$ pupils). Different negative life experiences and illnesses were addressed. **Results:** The participation rate was 88%. Among reported negative life experiences last year were a pressure felt to succeed (62%), death of a close person (26%), exposure to physical violence (22%), bullying at school (15%) and sexual violation (4%). A large number of the pupils had some chronic illness: hay fever (38%), eczema (29%) and asthma (13%). Reported illnesses the previous 12 month were: headache (56%), painful neck or shoulders (35%), sore throat at least three times (15%), lower respiratory tract infection (9%) and mental problems for which help was sought (7%). During the week prior to the survey, 26% of all girls had symptoms of a depressive disorder, while this applied to 10% of all boys. Fifty-three percent of the boys (29% of the girls) who had depressive symptoms had been exposed to physical violence. Sexually violated boys had a high probability for seeking help for mental problems (OR = 4.9) and for frequent episodes of sore throat (OR = 2.5). Corresponding odds ratios for girls were 1.7 and 2.5, respectively.

Conclusion: Common illnesses in adolescence are significantly associated with negative life experiences. In clinical encounters with adolescents not only should the presenting complaints be addressed, but also other common illnesses and relevant background factors such as negative life events.

Key words: Adolescents, depression, disease, life experiences, violence

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The adolescent period is characterized by vitality and rapid development, but also vulnerability (1). An unsuccessful adolescence may have great impact on later adult life (2–4).

The assumption that almost all adolescents in western societies enjoy excellent health is now challenged by research data suggesting that both psychological and somatic complaints are highly prevalent in this age group. In a recent Norwegian cross-sectional survey, Haugland and co-workers found that among 15-year-olds, 18% reported one or more daily psychological complaints, whereas 14% experienced somatic complaints (5). In Finland, the prevalence of neck, shoulder and lower back pain among 12–18-year-olds has increased significantly during the last decade (6).

In adolescence, both mental and physical health are influenced by negative life events and experiences such as parents' divorce, death of a significant person, exposure to violence, or maltreatment (7). In a pros-

pective study of 13 to 16-year-old general practice attenders in central London, depression and anxiety disorders were found to be prevalent and often linked to physical symptoms (8). However, the general practitioners' (GPs') recognition of psychiatric morbidity in their young patients was rather poor (8).

Symptoms seem to increase with increasing age throughout adolescence, and both symptoms and negative life events tend to be clustered in individuals (5). Because psychological and somatic illnesses among teenagers are highly correlated, it has been proposed that they share, to some extent, a common aetiology (5).

The impact of low socio-economic status on morbidity has been reported for children (3, 9) and adults (10, 11), but not for adolescents.

Since adolescents are not just older children or younger adults, knowledge regarding adolescent health should not be based on extrapolations of research data

from other age groups. We therefore need specific research regarding adolescent health problems (12).

The aim of this study was to explore associations between self-perceived negative life experiences, and somatic and psychological symptoms and illnesses among 15-year-olds living in Oslo, Norway.

Methods and materials

During 2000 and 2001, a classroom survey was carried out among 15-year-old pupils at all lower secondary schools in Oslo as part of a collaboration between the Norwegian Institute of Public Health (NIPH) (formerly the National Health Screening of Norway), the University of Oslo and the Municipality of Oslo. This article is based on the part of the survey addressing adolescent negative life experiences, and their self-reported physical and psychological health (Fig. 1). Events and illnesses were selected based on a previous review (13). We also included a score instrument for the identification of depression, the Hopkin's Symptom Check List-10 (HSCL-10) (14) (Fig. 1). The HSCL-10 comprises 10 questions regarding different psychological symptoms experienced in the previous week. For each question there are four possible answers: from "not troubled" (1 point) to "heavily troubled" (4 points). An average score for all 10 items of ≥ 1.85 , i.e. a positive test, has recently been shown to be a valid predictor for depression among subjects aged 16–24 year, and this cut-off value corresponds to 1.75 in the more comprehensive 25-item questionnaire, HSLC-25 (14).

Prior to the survey, school authorities, school health employees, parents and pupils were informed about the survey. Parents could withdraw their child from participation by mailing in a return slip. Written informed consent for using the data for research was obtained from all pupils before they filled in the questionnaires.

Specially trained field workers visited each classroom and explained to the pupils how to complete the self-administered questionnaire, which was then filled in under the same conditions as a written exam. Subsequently, the field workers gathered all completed questionnaires.

Questionnaires were left behind at school for those not present on the day of the survey. For those still not responding, a copy was sent to them at home by mail along with a stamped addressed envelope.

The study protocol was placed before The Regional Ethics Committee, and approved by the Norwegian Data Inspectorate.

Based on a previous study (11), the pupils' home addresses in Oslo were categorized into four areas (along the east–west axis), with outer west being most wealthy, and inner east having the lowest average income.

Data regarding the two populations of 15-year-olds

gathered during 2000 and 2001, respectively, were pooled together and analysed as one cross-sectional study. The NIPH coded the questionnaires and prepared the data files, which were analysed by SPSS version 10.0. During analysis we dichotomized the four answer categories of three variables regarding negative life experiences as indicated in Fig. 1. Adjusted binary logistic regression analysis was used for showing associations between life events and illnesses. A p -value of ≤ 0.05 was chosen as a level for statistical significance, and associations are presented as odds ratios (OR) with 95% confidence intervals (CI).

Results

All lower secondary schools in Oslo, both public and private, with 10th grade pupils participated in the survey: 62 schools in 2000 and 60 schools in 2001. The total number of 10th grade pupils listed for the two years was 8435. Of these, 31 pupils were not able to fill in the questionnaire due to physical or mental disability, whereas 88 had moved or finished school, leaving 8316 (N) pupils eligible for participation. A further 127 refused to participate, and 846 were absent from school on the day of the study and did not return the mailed questionnaire. The questionnaire was filled in by 7329 (n) (participation rate 88.3%). Missing data due to answers not filled in were low, between 1 and 2.5% for items concerning life experiences, between 3.6 and 7.7% for items concerning illnesses.

All adolescents reported some health problems, and all illnesses were more frequent among girls (Table 1). The most common chronic diseases were hay fever and eczema, both reported from about every third youth. The most frequently reported illnesses of the last year, headache and pain in neck or shoulder, were reported by more than half and every third pupil, respectively. Regarding depressive symptoms last week (Fig. 1), one in four girls and one in 10 boys tested positive at the HSCL-10 screener (Table 1). All the 440 pupils who had sought some professional help for mental problems over the last year, tested positive at the HSCL-10 screener.

All adolescents reported some negative life experiences (Table 2). Two of three felt a heavy pressure to succeed, and every third had a perception of poor economy in his/her own family compared to the average. Regarding events of the previous year, one out of four reported that some close person to them had died, while every fifth had been exposed to physical violence within the last year (male-to-female ratio 2:1) (Table 2). Of the 22% who had been exposed to violence, 18% reported that adults were responsible for the violence.

The events most commonly associated with reported illness in boys were exposure to violence followed by

Negative life experiences

General

- Heavy pressure from others to succeed/to do well at school¹
- My parents are: married/partners, not living together
- Economy in my family compared to other families in Norway²

Last 12 months:

- experienced bullying at school/on the way to school³
- a parent (guardian) unemployed or qualified for disability pension
- someone close to you has died
- experienced sexual violence (e.g. indecent exposure, groping, unwilling sexual intercourse, etc.)
- exposed to physical violence⁴

Illnesses

Asthma

Hay fever

Eczema

Last 12 months:

- Pain in neck/shoulder
- Headache
- Sore throat (at least three times)
- Bronchitis or pneumonia
- Mental disorder for which you sought help

Items of HSCL-10

Have you in the course of the past week been troubled by feeling:

- Sudden fear for no reason
- Afraid or anxious
- Faint or dizzy
- Tense or harassed
- Guilty
- Sleeplessness
- Dejected
- Useless, of little worth
- That everything is a burden
- Hopelessness for the future

→ Possible four answers: no, slightly, much, very much

¹ Dichotomized during data analysis: No // Yes, at times; Yes, often

² Dichotomized during data analysis: Poor // Moderate; Good; Very good

³ Dichotomized during data analysis: Never // Sometimes; About once a week; Several times a week

⁴ Dichotomized during data analysis: Never // Yes, only by youth; Yes, only by adults; Yes, both youth and adults

Fig. 1. Specifications of the items addressed in the questionnaire.

being bullied (Table 3). For girls the corresponding events were the death of a close person, a high pressure to succeed, sexual abuse and parents not living together (Table 4).

For those who had encountered some help for mental problems over the last year, between 51% (boys) and 31% (girls) had been exposed to physical violence

during the same period. Among those who reported depressive symptoms in the last week, a substantial proportion (boys 53%, girls 29%) had experienced violence in the previous year, and most of them (82% of all) also felt a heavy pressure to succeed. Furthermore, experienced physical violence was significantly associated with increased occurrence of all addressed

Table 1. Self reported illnesses and symptoms among 15-year-old boys and girls in Oslo, Norway. Prevalence given in percent.

	Boys %	Girls %	Boys and girls %	Difference between genders *
<i>Chronic disease</i>				
Hay fever	36	40	38	s
Eczema	23	34	29	s
Asthma	13	14	13	
<i>Illness last year</i>				
Headache	46	66	56	s
Pain in neck/shoulder?	27	42	35	s
Sore throat $\geq$ three times	13	17	15	s
Bronchitis or pneumonia	8	9	9	
Sought help for mental disorder	5	9	7	s
<i>Symptoms last week</i>				
Depression (HSCL-10 > 1.85)	10	26	18	s
<i>n =</i>	3612	3695	7329**	

* s = significant $p \leq 0.01$.

** Missing data regarding gender in 22 responses.

illnesses among boys (Table 3), and with most illnesses among girls (Table 4).

Among girls, 6% had experienced sexual violation in the last year. Boys exposed to sexual violation (2%) had an almost five times increased probability of suffering some mental problems in need of help (Table 3), whereas the corresponding increased probability (odds ratio) among girls was 2.5 (Table 4). Furthermore, a substantial proportion of the sexually violated adolescents (boys 39%, girls 46%) tested positive at the HSCL-10 screener, and one out of five reported asthmatic illness. All reported illnesses were significantly associated and inter-correlated with self-reported mental health problems, and also with a positive HSCL-10 test ($p < 0.01$). The prevalence of self-reported illnesses was not influenced by socio-economic differences as expressed by the part of the city in which the pupils lived.

Discussion

This study substantiates the evidence that in ado-

lescence well-known negative life experiences are significantly correlated with common illnesses. This applies both to chronic and episodic, physical and psychological illnesses. Life events most commonly associated with illnesses were in boys violence followed by being bullied, and for girls that someone close had died, a high pressure to succeed and sexual abuse.

The various negative life events had different impacts on the teenagers' health. Highest odds ratios for complaints and illnesses were found for those having experienced physical violence, bullying and sexual violation, and for those who felt a high pressure to succeed. That half of the 15-year-old boys with symptoms of depression had experienced violence and that four of five of all those depressed also felt a heavy pressure to succeed emphasises the relationship between life experiences and depressive illness. Hence, negative life experiences and illnesses may be two sides of the same coin.

The reported pressure felt towards success probably also includes some of the normal and positive pressure and expectations to do well at school and in life in general. This category was nevertheless positively

Table 2. Self-reported negative life experiences among 15-year-old boys and girls in Oslo, Norway. Prevalence given in percent.

	Boys %	Girls %	Boys and girls %	Difference between genders *
<i>General</i>				
Heavy pressure from others to succeed	59	65	62	s
Economy in family poor	29	35	32	s
Parents not living together	31	32	31	
<i>Events last year</i>				
Someone close to you has died	24	28	26	s
Exposed to violence	29	16	22	s
Bullying at school/on the way to school	15	14	15	-
A parent (supporter) unemployed/disability pension	7	9	8	s
Exposed to sexual violation	2	6	4	s
<i>n =</i>	3612	3695	7329**	

* s = significant $p \leq 0.01$.

** Missing data regarding gender in 22 responses.

Table 3. The associations between self-reported illness and symptoms (dependent variables) and life experience (independent variables) among 15-year-old boys in Oslo, Norway. Odds ratios with 95% confidence intervals.

Experiences	Chronic disease			Illness last year					Sought help for mental disorder	Symptoms last week
	Asthma	Hay fever	Eczema	Sore throat (≥3 times)	Bronchitis or pneumonia	Headache*	Pain from neck/shoulder			HSCL-10
<i>General</i>										
High pressure to succeed	1.3 (1.0–1.6)*	1.0 (0.9–1.2)	1.0 (0.9–1.2)	1.2 (0.9–1.5)	1.0 (0.7–1.3)	1.4 (1.2–1.7)*	1.6 (1.3–1.9)*	1.5 (1.0–2.2)*		2.6 (1.9–3.6)*
Economy in family poor	1.1 (0.8–1.3)	1.2 (1.0–1.4)	1.0 (0.8–1.2)	1.2 (0.9–1.5)	1.0 (0.7–1.3)	1.4 (1.2–1.6)*	1.1 (0.9–1.3)	1.6 (1.1–2.2)*		1.7 (1.3–2.2)*
Parents not living together	1.3 (1.1–1.7)*	1.0 (0.8–1.1)	1.0 (0.9–1.3)	1.1 (0.8–1.2)	1.3 (1.0–1.7)	1.0 (0.9–1.2)	1.2 (1.0–1.4)	1.2 (0.9–1.7)		2.1 (1.1–2.0)*
<i>Events last year</i>										
Someone close person died	1.0 (0.8–1.3)	1.0 (0.9–1.2)	1.1 (0.9–1.3)	1.5 (1.2–1.8)*	1.1 (0.8–1.5)	1.3 (1.1–1.5)*	1.2 (1.0–1.4)	1.2 (0.9–1.7)		1.4 (1.0–1.8)*
Exposed to violence	1.4 (1.1–1.7)*	1.3 (1.1–1.5)*	1.2 (1.0–1.5)*	1.3 (1.0–1.6)*	1.9 (1.5–2.5)*	1.4 (1.2–1.6)*	1.5 (1.3–1.8)*	2.4 (1.7–3.4)*		2.5 (1.9–3.2)*
Bullying at school	1.0 (0.8–1.4)	1.0 (0.8–1.2)	1.3 (1.1–1.7)*	1.2 (0.9–1.5)	1.3 (1.0–1.9)	1.3 (1.1–1.7)*	1.8 (1.5–2.3)*	1.7 (1.2–2.5)*		2.9 (2.2–3.8)*
A parent (supporter) unemployed or disability pension	1.5 (1.1–2.2)*	1.2 (0.9–1.6)	1.2 (0.9–1.6)	1.4 (1.0–2.1)	1.7 (1.1–2.6)*	0.9 (0.7–1.2)	1.3 (1.0–1.8)	0.9 (0.5–1.6)		1.2 (0.8–1.8)
Sexual violation	1.7 (0.8–1.8)	0.9 (0.5–1.7)	1.5 (0.8–2.8)	2.5 (1.4–4.7)*	1.6 (0.7–3.6)	2.5 (1.3–4.7)*	1.9 (1.0–3.4)*	4.9 (2.4–10.1)*		4.4 (2.4–8.2)*

* $p \leq 0.05$.

Table 4. The associations between self-reported illness and symptoms (dependent variables) and life experience (independent variables) among 15-year-old girls in Oslo, Norway. Odds ratios with 95% confidence intervals.

Experiences	Chronic disease			Illness last year					Sought help for mental disorder	Symptoms last week
	Asthma	Hay fever	Eczema	Sore throat (≥3 times)	Bronchitis or pneumonia	Headache*	Pain from neck/shoulder			HSCL-10
<i>General</i>										
High pressure to succeed	1.0 (0.8–1.2)	1.1 (1.0–1.3)	1.1 (0.9–1.3)	1.4 (1.1–1.8)*	1.5 (1.2–2.0)*	1.5 (1.2–1.7)*	1.6 (1.4–1.9)*	1.5 (1.1–2.1)*		2.5 (1.1–3.1)*
Economy in family poor	1.0 (0.8–1.3)	1.1 (0.9–1.3)	1.0 (0.8–1.2)	0.9 (0.7–1.1)	0.8 (0.6–1.1)	1.3 (1.1–1.5)*	1.3 (1.1–1.5)*	1.1 (0.8–1.4)		1.7 (0.8–2.4)
Parents not living together	1.2 (1.0–1.5)	1.1 (0.9–1.3)	1.1 (1.0–1.3)	1.5 (1.2–1.8)*	1.6 (1.3–2.1)*	1.0 (0.9–1.2)	1.3 (1.1–1.6)*	1.6 (1.2–2.0)*		1.5 (1.2–2.0)*
<i>Events last year</i>										
Someone near person died	1.3 (1.0–1.6)*	1.5 (1.3–1.8)*	1.2 (1.0–1.4)	1.4 (1.0–1.7)*	1.2 (0.9–1.5)	1.3 (1.1–1.5)*	1.5 (1.3–1.8)*	1.4 (1.1–1.9)*		1.5 (1.1–1.9)*
Exposed to violence	1.4 (1.1–1.8)*	1.0 (0.8–1.2)	1.0 (0.8–1.3)	1.1 (0.8–1.4)	1.4 (1.1–2.0)*	1.5 (1.2–1.9)*	1.5 (1.3–1.9)*	1.8 (1.4–2.5)*		2.0 (1.4–2.5)*
Bullying at school	1.0 (0.8–1.3)	1.1 (0.9–1.3)	1.0 (0.9–1.4)	1.2 (0.9–1.5)	1.2 (0.9–1.5)	1.3 (1.0–1.6)*	1.3 (1.0–1.5)*	1.5 (1.1–2.0)*		2.1 (1.1–2.0)*
A parent (supporter) unemployed or disability pension	1.2 (0.9–1.7)	1.2 (0.9–1.5)	0.9 (0.7–1.2)	1.1 (0.8–1.5)	1.4 (0.9–2.1)	1.0 (0.7–1.3)	1.1 (0.8–1.4)	1.5 (1.0–2.2)*		1.3 (1.0–2.2)*
Sexual violation	1.2 (0.8–1.8)	1.3 (1.1–1.8)*	1.4 (1.0–1.9)*	2.5 (1.6–3.1)*	1.3 (0.8–2.0)	1.6 (1.1–2.2)*	1.3 (1.0–1.8)	1.7 (1.2–2.6)*		1.9 (1.2–2.6)*

* $p \leq 0.05$.

associated with an increased burden of illness. One in four girls tested HSCL-10 positive compared to about one in 10 boys. One possible explanation for this pronounced difference between the genders may be that the HSCL-10 test is too sensitive for predicting depression among adolescent girls.

Jones and Kafetios have recently used the HSCL-25, among others, to screen for mental health problems among 337 school children (13 to 15 years) in Bosnia after the war (15). In a subsample ($n = 40$) comprised of high and low test scorers, the test results corresponded well with a qualitative assessment in slightly less than four of five cases. The HSCL-10 test is recently validated for older adolescents of both genders and for young adults (13). That all adolescents who had encountered some professional help for mental problems also tested HSCL-10 positive supports the fact that a positive HSCL-10 test is a valid predictor for mental health problems in this age group. The finding that girls more commonly seek help for mental problems also corresponds well with the HSCL-10 results. A gender difference for depressive illness in adolescence which corresponds well with our results has recently been reported from Canada, Great Britain and the United States (16).

It may be surprising that as many as one in four reported that a close person had died the last year. A positive answer here will, however, partly reflect how adolescents interpret the term "close" person. On the questionnaire was also included an open-ended question regarding experienced grief. This material is currently under analysis by others (Cecilie Daae, personal communication).

That about one in five had been exposed to some physical violence over the last year should cause some concern. In particular this concern is relevant for the approximately one in five who had been exposed to violence by an adult. However, the figures here should be read with some caution since we do not know either the frequency or the seriousness of the violence executed.

The answers to the questions concerning a felt pressure to succeed, bullying and the family's economy were dichotomized, with "infrequent" included in the "yes" category, which may therefore contain problems of less magnitude. This may explain the relatively low odds ratios found for associations between these experiences and various illnesses. Within a 12-month retrospective period, both significant events and illnesses may slip the memory. Experiences occurring before this period may also have influenced the adolescents.

The significantly different patterns of associations found between negative life events and illnesses for the two genders may suggest that adolescent health problems are related to different social contexts for boys and girls (4, 17).

That neither parents becoming unemployed nor

socio-economic status affected adolescent health status agrees well with data from studies in Scotland (18, 19) and England (20). This may be explained by the relatively well functioning social support system in our countries.

Almost all recorded negative life experiences were found to be significantly associated with symptoms of depression (HSCL-10). The high numbers of positive associations with negative life experiences, and the inter-correlation with physical illnesses, suggest that a depressive state may represent a common denominator which may be a result of a negative life event but which may also partly contribute to the aetiology of some other illnesses. Psychological stress can for example influence immunologic responses (21), which may partly explain the significant associations between negative life experiences and somatic illnesses such as eczema, hay-fever, asthma and respiratory tract infections.

The high participation rate within a total population of 15-year-olds in Oslo implies that our findings are representative for Oslo in particular and maybe also for other urban settings in comparable countries.

Missing data were few regarding each question. This suggests that the pupils understood the questions well, which contributes to the internal validity of the study.

Some limitations of our results should be considered. In this cross-sectional study we were not able to explore causal relationships between life events and illnesses. We cannot exclude a possibility that lifestyle factors, e.g. smoking, alcohol and drug abuse, may confound some of the results. However, while negative life events increase the prevalence of cigarette smoking, there is no evidence supporting a reverse relationship (22).

Based on this study, we recommend an increased awareness for the relationship between negative life events such as physical violence, sexual violation and a feeling of heavy pressure to succeed, and mental (depression) and physical illnesses (eczema, hay fever, asthma and respiratory tract infections).

Our findings may contribute to a more dynamic understanding of adolescent health problems, and thus their prevention and treatment (23, 24). Knowledge about the impact of various life experiences on adolescent health is a prerequisite for, among others, GPs to be better able to understand and interact therapeutically with adolescent patients (8, 25). In clinical encounters with teenagers it is a basic rule not to only ask about the presenting complaints. For adolescents with many symptoms, it is appropriate also to ask cautiously about relevant background factors such as negative life events. However, more research is needed to explore the relationship between various negative life experiences and illness in adolescence.

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10 Article II

Original article

Do negative life experiences predict the health-care-seeking of adolescents? A study of 10th-year students in Oslo, Norway

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Abstract:

Purpose: To analyze associations among the negative life experiences and health-care-seeking of adolescents during the 12 months before the study.

Methods: Cross-sectional questionnaire study among 10th-year students at all secondary schools in Oslo.

Results: In 2000 and in 2001, 7329 (88%) of Oslo's 8316 secondary-school students responded to the questionnaire. Some contacts with primary health care during the previous year were reported by 71% of respondents, and 6% had seen a mental health practitioner (psychologist or psychiatrist). Health care utilization was not correlated with the family's financial situation as reported by the student (boys = 1019; girls = 1258), or with a parent's unemployment (boys = 253; girls = 325). The 2112 boys (59% of all) and 2378 girls (64%) who reported feeling strong pressure from others to succeed, had more contacts with all primary health care services. Girls, but not boys, who reported being bullied by others reported more psychologist or psychiatrist visits than did their nonbullied peers. Exposure to physical violence was associated with a significant increase in visits to the School Health Service, family physician, and emergency medical service, and was related to more than doubling the probability of visiting a mental health practitioner. Being sexually violated during the previous year increased the likelihood of boys visiting mental health practitioner more than four times (odds ratio [OR] 4.6; 95% confidence interval [CI] 1.7–12.2); and visiting School Health Service by nearly four times, (OR 3.7; 95% CI 1.0–13.5).

Conclusion: Variation in adolescent health care seeking can, by and large, be predicted by negative life experiences. © 2005 Society for Adolescent Medicine. All rights reserved.

Keywords:

Adolescent health; Illness; Depression; Health care providers; Prevention; Primary care; Physicians; Family

The health-care-seeking behavior of adolescents may reflect illnesses and “invisible needs” related to various negative life experiences when they exceed a young person's capability of psychological readjustment and adaptation [1]. Negative life events are among the factors that appear to increase consultations with family physicians (FPs) [2,3]. Common negative life experiences among

young people, such as pressure to succeed, bullying, and exposure to physical violence are positively correlated with increased physical and psychological symptoms and illnesses [4–6]. Among French adolescents, Gasquet et al. found that youth whose parents did not live together more often turned to professional help for depression [7]. Furthermore, it has been shown that adolescents visiting the FP for depression also have generally higher consultation rates for other reasons [7,8].

However, some studies suggest that young people meet with barriers in their health-care-seeking [9–11]. Moreover, Zwaanswijk et al. found that many adolescents do not rec-

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ognize their health problems and that the majority of them had unmet health needs [12]. Similarly, in a U.S. study, adolescents reporting poor health tended to underuse health care facilities [11].

Other studies of young people with physical or psychological ill health demonstrate that they may have their needs met by seeking health professionals in primary care [13,14], particularly from their FP [15–18], but little is known about the relationships among common negative life events and young peoples' health-care-seeking [1].

The aim of this study was to investigate negative life experiences as possible predictors of adolescent health-care-seeking.

Methods

The Oslo Health Study 2000–2001 was conducted as a joint collaboration among the National Health Screening Service of Norway (now the Norwegian Institute of Public Health), the University of Oslo, and the Municipality of Oslo. The portion of this study devoted to adolescents encompassed all 10th grade students (virtually all of whom were 15 to 16 years of age) at all public and private schools in Oslo.

Before the survey, school authorities, school health employees, parents, and students were informed about the survey. The students completed the questionnaire during 2 school hours. A project assistant was present in the classroom to inform the students about the survey and to administer the questionnaire.

Questionnaires were left at the school to be completed by students who were not present on the day of the survey. Those who did not respond were sent a copy by mail to their home address along with a stamped, addressed envelope. The survey is described in greater detail elsewhere [5].

The selection of negative life events addressed in the questionnaire was based primarily on a previous review [19] and related to the domains of home, friends, and school (Figure 1). Furthermore, the students were asked if they had sought help from health professionals during the previous year owing to mental problems (Figure 1). Finally, a score instrument for the identification of depression, the Hopkin's Symptom Check List-10 (HSCL-10) [5], was included. The HSCL-10 consists of 10 questions regarding different psychological symptoms experienced during the previous week. There are four possible answers to each question: from "not troubled" (1 point) to "heavily troubled" (4 points). A positive score, an average score of all 10 items of 1.85 or higher, has been validated to predict depression among Norwegian subjects aged 16 to 24 years [20].

In Norway, the School Health Service, the Youth Health Clinic, FP, and physicians on call are all considered to be parts of the primary care health system (Figure 1). FPs are accessible during the day, physicians on call during after-

Life experiences

General

- Experienced heavy pressure from others to succeed/to do well at school¹
- Parents are: Married/partners, not living together
- Family's financial situation compared to other families in Norway²

Last 12 months:

- experienced bullying at school or on the way to school³
- a parent (supporter) unemployed or qualified for disability pension
- someone close has died
- experienced sexual violation (e.g. indecent exposure, pawing, unwilling sexual intercourse etc.)
- exposed to physical violence

Own health

- Have, during last 12 month, had mental disorder for which help was sought?⁴

Health services used (last 12 months)⁵

- Schools Health Service
- Youth Health Clinic
- Family physician (FP)
- Emergency service
- Mental health practitioner (psychologist or psychiatrist)
- Admission to hospital

¹ Dichotomised during data analysis: No // Yes, at times; Yes, often

² Dichotomised during data analysis: Poor // Moderate; Good; Very good

³ Dichotomised during data analysis: Never // Sometimes; About once a week; Several times a week

⁴ Answers: Yes, no

⁵ Dichotomised during data analysis: Never, 1–3 times // ≥ 4 times

Fig. 1. Items addressed in the questionnaire.

noons, nights and weekends, and patients have to pay a fee for seeing them.

The School Health Service is usually located at the schools and is staffed part-time with a nurse and to a lesser extent by a physician (usually an FP). The School Health Service provides immunizations and routine physical screening examinations. In several schools, the students in 10th grade are invited to talk with the school nurse on an individual or group basis on issues of adolescence health. Services at School Health Service are free of charge.

The main responsibility of Youth Health Clinics is to give young people information about sexuality, sexually transmitted diseases, and contraceptives. Their core staff consists of a nurse and a physician (usually an FP). A Youth Health Clinic is open only during afternoons, usually a few hours weekly, and its services are free of charge.

In Norway, patients are usually referred to a psychologist or a psychiatrist by an FP and there is a fee for visiting FPs, emergency services, and psychologists or psychiatrists.

Because Norwegians between the ages of 16 and 24 years have on average 3.3 contacts per year with a primary-care doctor, i.e., FP or physician on call [21], students were given the option of checking "none," "1–3" or "4 or more" contacts the previous year with the services (Figure 1).

Cross-tabs and binary adjusted logistic regression analyses were used to analyze the data. Dependent and covariate variables were dichotomized, as shown in Figure 1. A sum-score of negative life experiences was made for correlating an increased burden with health care seeking. Calculations were performed in SPSS X (SPSS Inc. Chicago, Illinois),

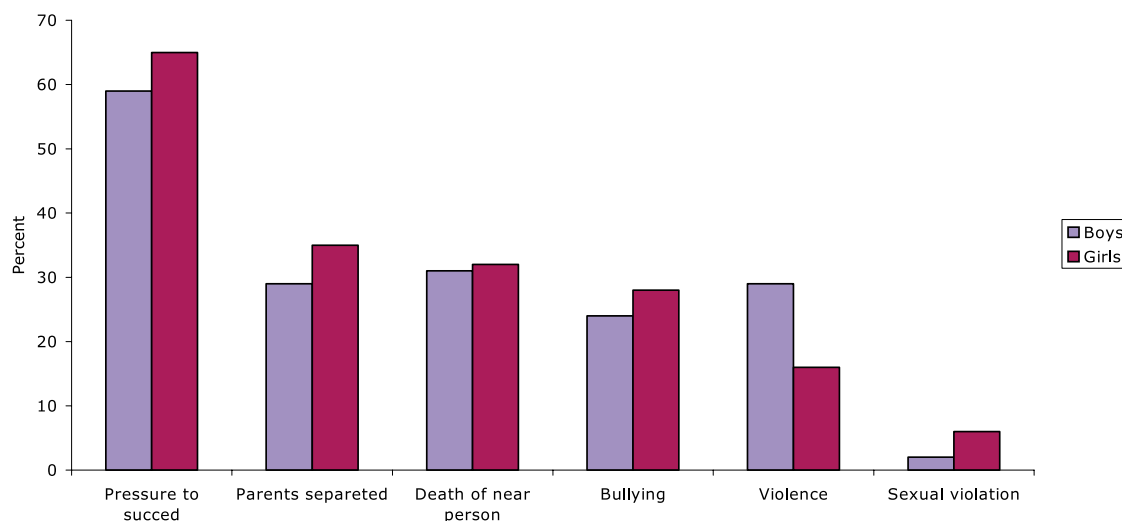


Fig. 2. 10th-year students ($n = 7329$) in Oslo. Percents reporting different negative life experiences the previous year.

and results given as odds ratios (OR) with 95% confidence intervals (95% CI).

For all visitors to the various health care services, we calculated the prevalence ratio between those who had a positive HSCL-10 test, and those who had seen a mental health practitioner.

The protocol was shown to the Regional Committee for Medical Research Ethics, and received the approval of the Norwegian Data Inspectorate before the study.

Results

There was a response rate to the questionnaire of 88%; 7329 of 8316 possible 10th grade students in Oslo. Missing data caused by skipped questions varied from 1.2% in the simple, factual questions to 3.6% in the more sensitive questions related to the HSCL-10 test.

Some contact with primary health care over the previous year was reported by 71% of respondents; 4% had visited only one type of health care facility and approximately two-thirds (59% of boys; 66% of girls, $p < .01$) had visited a primary-care doctor during the previous year. Among those who had visited the School Health Service during the year before the study, 85% of boys and 76% of girls ($p < .01$) had also seen an FP. For respondents who consulted the Youth Health Clinic, corresponding figures were 94% and 88% ($p < .01$), respectively. Almost all (98%) who had attended a mental health practitioner had also seen an FP during the same period. Among adolescents with a positive HSCL-10 test score, 15% had visited a mental health practitioner and 66% had seen an FP. A young person experiencing two or more negative life experiences had significantly more FP visits and hospital admissions.

Violence had been experienced by 1016 (28%) of the boys and 581 (16%) of the girls (Figure 2). This negative life experience was associated with increased use of almost

all listed health services (Figure 3). Visits to the School Health Service were positively correlated with exposure to violence, with ORs ranging from 1.6 (boys) to 2.7 (girls). Corresponding ORs for those who visited a mental health practitioner were 2.2 and 2.3, respectively (Tables 1 and 2). Being bullied on the way to or at school (reported by 541 boys and 518 girls) was associated with increased health care seeking only in girls, who reported more frequent use of School Health Services and mental health care (Tables 1 and 2). Students who had been sexually violated (boys = 65; girls = 277) used all the health care services more often, and this was particularly the case for boys (Tables 1 and 2).

Students who felt strong pressure from others to succeed (62%) had increased number encounters with all primary health care services (Tables 1 and 2). Both boys (847) and girls (999) who reported the death of a close person visited FPs more frequently. Health care utilization did not correlate with family's unfavorable financial situation as reported by the student (boys = 1019; girls = 1258) or with a parent's unemployment (boys = 253; girls = 325).

Among those who visited a primary-care doctor four or more times per year, the prevalence ratio was 0.5 (FP and emergency services 169/311, School Health Service 56/103) between those who said that they did seek help for mental problems and those with a positive HSCL-10 test score. The corresponding prevalence ratio for frequent mental health care visitors was 1.2 (125/108).

Discussion

This study confirms that in adolescence, negative life experiences are closely related to increased use of health services. Among 10th grade students exposed to physical violence and sexual violation, the use of all health care services were greater than for those of their peers. In addition, young people who experienced heavy pressure to suc-

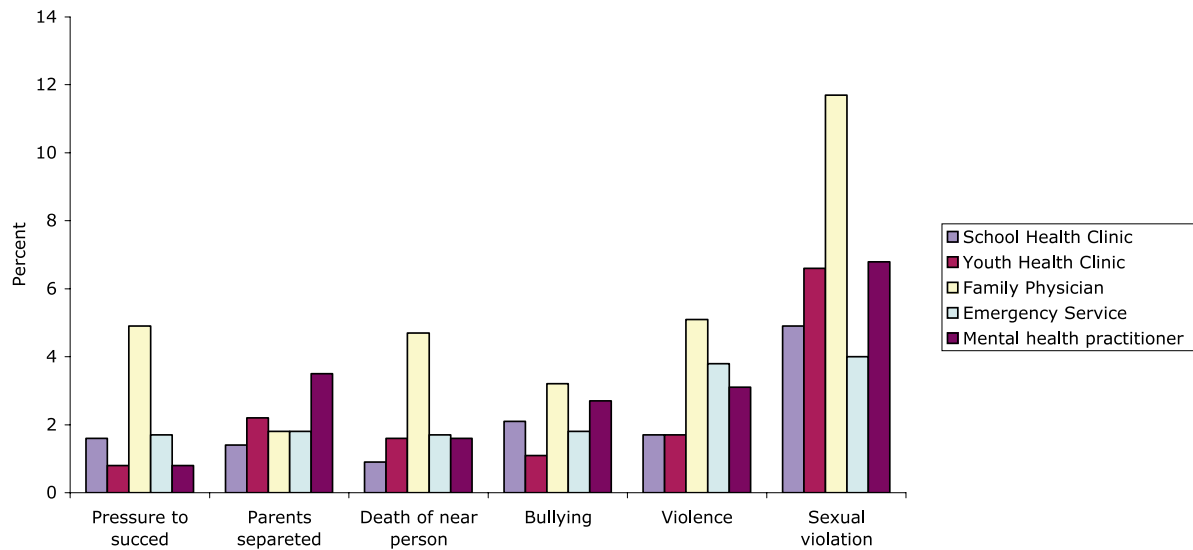


Fig. 3. 10th-year students ($n = 7329$) in Oslo. Percent increase health care seeking (≥ 4 visits) related to various negative life experiences.

ceed or who had had someone close to them die went more commonly to see a primary-care doctor. Experiencing two or more negative life experiences were significantly associated with more FP visits and hospital admissions.

The proportion of students reporting visits to the FP in this study corresponds well with figures for Norwegian students in general [22], students from the Nordic countries [2,23], and is comparable to corresponding figures from the United Kingdom [24].

Violence and sexual violation

Violence and sexual violation were the two experiences most strongly associated with increased health care use. One possible explanation may lie in the immediate physical and psychological needs of these students, which also may ex-

plain their disproportionately high admission to hospitals. This finding is in line with the results of Kashani et al. [25], who more than 20 years ago found that hospitalized children between 7 and 12 years of age had experienced significantly more negative life events than had children in the general population. This phenomenon may reflect both the vulnerability of adolescents and the seriousness of the negative life events. There are probably many barriers to their health care seeking, not the least of which are finances and fear of appearing inappropriate [10].

The seriousness of sexual violation may vary, because this question implies a wide range of experiences, e.g., indecent exposure, pawing, unwilling sexual intercourse, etc.

The finding that boys exposed to violence or sexual

Table 1

Male 10th year students ($n = 3612$)^a in Oslo; association between health-care-seeking (dependent variable) and negative life experiences (independent variable); adjusted odds ratios with 95% confidence intervals

	Public health ^b		Primary care ^b		Secondary care	
	School health service	Youth health clinic	Family physician	Doctor on call	Mental health practitioner ^b	Admission to hospital
General						
Heavy pressure from others to succeed	1.6 (0.7–3.4)	1.0 (0.4–2.3)	1.5 (1.2–2.1)*	1.7 (1.1–2.8)*	0.7 (0.4–1.2)	1.2 (0.9–1.7)
Financial situation in family poor	1.5 (0.7–2.9)	0.6 (0.2–1.8)	1.0 (0.7–1.3)	1.0 (0.7–1.6)	2.2 (1.3–3.7)*	1.2 (0.9–1.7)
Parents not living together	1.9 (0.9–3.7)	1.5 (0.7–4.0)	0.9 (0.7–1.3)	1.0 (0.6–1.5)	1.6 (1.0–2.7)	1.0 (0.7–1.4)
Events last year						
Someone close has died	0.5 (0.2–1.2)	0.9 (0.3–2.5)	1.4 (1.1–1.9)*	1.1 (0.7–1.8)	1.0 (0.5–1.7)	1.3 (0.9–1.8)
Exposed to violence	2.7 (1.3–5.3)*	2.1 (0.9–5.0)	1.5 (1.2–2.0)*	2.3 (1.6–3.5)*	2.3 (1.4–3.9)*	1.5 (1.1–2.0)*
Bullying at school/on the way to school?	1.9 (0.9–4.0)	0.8 (0.2–2.7)	1.1 (0.8–1.5)	1.4 (0.9–2.2)	1.3 (0.7–2.4)	1.0 (0.7–1.5)
A parent unemployed	1.5 (0.5–4.1)	1.5 (0.3–6.6)	1.1 (0.7–1.7)	1.2 (0.6–2.4)	1.6 (0.8–3.3)	0.8 (0.4–1.5)
Exposed to sexual violation	3.7 (1.0–13.5)*	—	1.7 (0.8–3.7)	2.2 (0.8–5.8)	4.6 (1.7–12.2)*	2.3 (1.0–5.3)*

* significant ($p < .05$).

^a Missing data regarding gender in 22.

^b ≥ 4 visits last year.

Table 2

Female 10th year students (n = 3695)^a in Oslo; association between health-care-seeking (dependent variable) and negative life experiences (independent variable); adjusted odds ratios with 95% confidence intervals

	Public health ^b		Primary care doctor ^b		Secondary care	
	School health service	Youth health clinic	Family physician	Doctor on call	Mental health practitioner ^b	Admission to hospital
General						
Heavy pressure from others to succeed	1.7 (1.1–2.4)*	1.5 (0.9–2.6)	1.5 (1.2–2.0)*	1.5 (0.9–2.4)	1.1 (0.7–1.8)	1.3 (0.9–1.7)
Financial situation in family poor	1.4 (1.0–2.0)*	1.3 (0.9–2.1)	0.9 (0.8–1.2)	1.4 (0.9–2.1)	1.1 (0.7–1.6)	1.2 (0.9–1.6)
Parents not living together	1.1 (0.8–1.6)	3.0 (1.9–4.7)*	1.2 (1.0–1.5)	1.2 (0.7–1.7)	2.9 (2.0–4.4)*	1.3 (1.0–1.7)
Events last year						
Someone close has died	1.3 (0.9–1.8)	2.0 (1.3–3.1)*	1.4 (1.2–1.8)*	1.6 (1.1–2.4)*	1.4 (0.9–2.0)	1.2 (0.9–1.6)
Exposed to violence	1.6 (1.1–2.4)*	1.9 (1.2–3.1)*	1.5 (1.2–2.0)*	2.0 (1.3–3.3)*	2.2 (1.5–3.3)*	1.2 (0.8–1.7)
Bullying at school/on the way to school?	1.7 (1.1–2.5)*	1.3 (0.8–2.2)	1.1 (0.9–1.5)	0.9 (0.5–1.6)	1.6 (1.0–2.5)*	1.1 (0.8–1.6)
A parent unemployed	1.5 (1.0–2.4)	1.1 (0.6–2.0)	1.5 (0.9–2.5)	1.2 (0.6–2.2)	1.5 (0.9–2.5)	1.0 (0.6–1.6)
Exposed to sexual violation	1.3 (0.8–22.2)	3.4 (2.0–5.7)*	1.7 (1.2–2.4)*	1.6 (0.9–3.0)	1.8 (1.0–3.1)*	2.1 (1.4–3.3)*

* significant ($p < .05$).

^a Missing data regarding gender in 22.

^b ≥ 4 visits last year.

violation used health care more than their peers contrasts the general trend of boys as minor health care seekers [26,27]. That sexual violation had so great an impact on boys' health care seeking may reflect general gender differences [28]. However, boys exposed to sexual assault have commonly been found to report symptoms of posttraumatic stress disorder [29]. Sexually violated boys were almost four times as likely as their peers to encounter the School Health Service. Yet, although victims of sexual abuse require time both to disclose and to handle their victimization [30], rather few of them visited the School Health Service four times or more, a share of which probably were for routine checkups where sexual abuse not was addressed.

Pressure to succeed

The large number of students reporting that they felt a strong pressure to succeed and to do well in school also had a disproportionately large number of health care visits. Street et al. found that when young people's happiness was dependent on achievements, it was also related to depression [31]. We found, however, that neither boys nor girls who felt pressures to succeed were more likely than their peers to visit a mental health practitioner, a finding that does not support a strong relationship between mental health and the strong pressure to succeed.

Parents living apart

Whether or not the adolescent's parents lived together was not related to the amount of health-care-seeking among boys. Our results do not give account for explaining this finding. It can, however, be hypothesized that because separated and divorced parents are now so common, their children do not experience much stigmatization, and perhaps they receive sufficient support from other people. It is also possible that young boys with divorced parents do need

some help from health care, e.g., because of depression [5], but that their parents are too wrapped up in their own problems to acknowledge the necessity of this step.

Girls whose parents did not live together made greater use of Youth Health Clinics, a finding more consistent with studies showing that living with one parent is related to more mental illness [5,32]. Gasquet et al. found that young people in this situation more often seek help for depression [7]. Thus, one explanation for our findings may be that adolescents' problems related to parents' divorce are not recognized as health problems [8,33,34]. Because girls living with a single parent tend to be more sexually active [35], they are more likely to consult a Youth Health Clinic.

Underutilization and unmet needs

Even though bullying has been reported by others to be correlated with increased illness, especially depression [5,6,36], we did not find that this experience influenced health-care-seeking in boys, and only to a modest degree in girls.

Among frequent visitors to the FP or School Health Service, only half of the students with a positive depression score reported that they had sought some professional help for psychological illness. One reason for this discrepancy may be that the HSCL-10 test is too sensitive. Another possible explanation is a lack of awareness among young people of the symptoms of depression, which is consistent with findings of others [7,8,34]. This may also reflect that some students underuse health care and have unmet needs, which is consistent with some U.S. studies [11,37].

Validity, reliability and limitations

The high participation rate within a total population of 10th-year students in Oslo implies that our findings are representative for Oslo, and probably also for comparable

settings elsewhere [5]. Santelli et al. have shown that adolescents can be an accurate source of health care service data [38], and indeed there were few missing data for any of the questions in our study. However, the absence of survey questions about reasons for encounter is a shortcoming when exploring the associations.

Furthermore, the cutoff point for health-care-seeking (≥ 4), may represent another limitation giving false, nonsignificant associations between negative life experiences and health care visits.

As this was a cross-sectional study, we cannot explore causal relationships. There may be such confounding factors as the personality and life style of the victim and environmental factors [39]. The student's report of a poor financial situation in the family or a parent (supporter) becoming unemployed or qualifying for disability pension may be linked to a way of life, character, or heritage. The family's finances as perceived by the pupils were, however, found to have only minor or no effect on health-care-seeking in our study, which is consistent with earlier studies in the Nordic countries [2,23,40].

A variation in health care seeking can be predicted by negative life experiences. Accordingly, there is a need in clinical practice to assess adolescents with frequent visits for possible negative life experiences. The specific seeking profiles, i.e., kind of health care used, associated with different negative experiences, supports the conclusion. However, the degree to which the relationship between negative life experiences and health care service represents appropriate use of the service requires further research.

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11 Article III

Positive factors associated with promoting health in low-risk and high-risk populations of 15- and 16-year-old pupils in Oslo, Norway

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Abstract

Aim: To explore possible risk-reducing factors associated with the incidence of common illnesses and use of healthcare services among adolescents. **Methods:** Cross-sectional questionnaire study conducted in all Oslo schools among all 15- and 16-year-olds in 2000 and 2001. The adolescent population was divided into a low-risk (LR) and a high-risk (HR) group, and into quartiles, based on a sum score of different negative life experiences. The groups were compared with respect to potential risk-reducing factors. **Results:** 88% of the 8316 pupils filled in the questionnaires. The difference between the LR and HR groups was largest for the possible risk-reducing factor "my family values my opinion" (LR group = 92%; HR group = 82%), and "I manage to solve serious problems myself" (LR = 91%; HR = 86%). The family valuing the adolescents' opinions was the risk-reducing factor most often associated with lower incidences of illness and healthcare utilization. Among the adolescents at highest risk, less depression was strongly related to positive relationships with friends, boys: odds ratio = 0.1 (CI 95%: 0.0–0.7); and girls: 0.2 (0.1–0.5). Adolescents reporting that they managed their own problems had about half the risk of depression.

Conclusion: Good relations with family and friends, and a feeling of managing one's own life, are significantly related to lower rates of illness, in particular depression, and less healthcare-seeking behaviour. The risk-reducing effects increase with increasing risk. Healthcare workers therefore need to pay more attention to HR patients.

Key Words: Adolescent, life experiences, risk, risk reduction, families

Introduction

A challenge for primary healthcare professionals is to find positive factors in the lives of young people that have the potential to reduce illness among adolescents at risk. Unfortunately, these positive factors, which we call risk-reducing factors, have not been well identified or described, but we believe that they may constitute some of the core elements of resilience [1]. Resilience is widely used to describe the ability to modify effects of negative life experiences in relation to psychosocial outcomes [1,2]. In the resilience literature, researchers have most commonly focused on three main levels: the community, the family and the individual [1].

In one Hawaiian study, 698 babies born in 1955 were followed for 32 y [3–5]. Approximately 200 of the subjects were defined as being of high risk. Of these, about one-third developed into competent, confident and caring adults, a result that the authors attributed to the following protective factors: positive school

experiences, good relations with parents and a general positive state of mind [3–5].

In a Finnish survey, the well-being of 14-to-16-year-old schoolchildren was explored [6]. More than fifty independent variables addressed their background and school context. Social relations within and outside school were two of the factors that demonstrated the strongest correlation with feeling well [6].

A strong relationship with one's own family is a powerful positive factor for young people exposed to negative life experiences which may otherwise cause physical and emotional ill-health [7,8]. Resilient youth probably receive more guidance and supervision from their parents and grow up in better functioning families [9].

A cluster of personality characteristics, skills and values appears in youth who make a successful adaptation to adult life [3,4,10]. Those who perceive themselves as being resilient feel less lonely and hopeless compared to those who perceive themselves

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as not being resilient [11]. High educational aspirations and regular physical activities are two protective factors identified among high-risk adolescents [9,12,13].

Resilience has been conceptualized as a dynamic process involving protective processes to recover from negative events [1]. Both the health effects of the adverse experiences that adolescents face and the relevance of possible protective and moderating qualities may vary over time in our rapidly changing society [14–16]. Consequently, risk-reducing factors related to health must be explored at regular intervals. Primary health professionals and community planners, therefore, should take advantage of new knowledge about risk-reducing factors on an ongoing basis [15,17,18].

The purpose of this study was to identify factors associated with the reduced incidence of illness and use of healthcare services in adolescence. Furthermore, we aimed to explore the magnitude of these factors in adolescents with a relatively low and a relatively high number of reported negative life experiences.

Methods

As a part of the youth study in the greater Oslo Health Survey, a questionnaire was distributed at schools to all 10th grade (15–16-y-old) pupils in Oslo County during 2000/2001 [19]. The survey was a collaboration among the Norwegian Institute of Public Health (NIPH), the University of Oslo and the Municipality of Oslo.

This paper follows two earlier articles based on the same survey [19,20]. In the first, we found that a number of selected negative life experiences in the lives of adolescents were strongly correlated with common illnesses [19]. The second article reported that adolescents' negative life experiences were positively associated with increased use of healthcare services [20].

The present study is based on questions addressing possible risk-reducing factors in relation to adolescents' negative life experiences, self-reported illness and healthcare utilisation (Box 1). A score instrument was also included in the questionnaire for the identification of depression: the Hopkin's Symptom Check List-10 (HSCL-10). The HSCL-10 consists of 10 questions regarding different psychological symptoms experienced during the previous week (Box 1). A positive score, an average score of all 10 items of 1.85 or higher, has been validated to predict depression [19,20].

The selection of negative life events or risk factors was based on clinical experience and on the two earlier studies [19,20]. A "low-risk" (LR) and a "high-risk" (HR) population were established based on four negative life experiences most strongly associated with

risk for illness [19] and healthcare utilization [20], and depression as common denominator of illness [19]. The selected negative life events were: "a heavy pressure from others to succeed", "parents not living together", "having been bullied" and "exposure to violence". These life events also reflect the three levels of each person's life: the community, the family and the individual [1]. A predicted probability was calculated as a logarithmic function based on a sum score of the four negative life events as covariates and the HSCL-10 score as the dependent variable.

Furthermore, the mean probability value was chosen as a cut-off point, differentiating between a LR and a HR group of approximately the same size. The terms "LR" and "HR" used in this article refer to the two groups established by this dichotomizing of the population. In addition, quartiles were calculated to study the risk-reducing effect with increased total risk based on the four negative life experiences.

Adjusted binary logistic regression was used. The variables were dichotomized as described in Box 1. Breslow-Day (B-H) statistics were used for testing the homogeneity to explore possible significant differences in risk reduction between the quartiles.

Depression (i.e. a positive HSCL-10 test score), asthma, eczema and throat infections were used as dependent illnesses; and attendance rates at school health services (SHS), with general practitioners (GPs) and with a mental health practitioner were used as dependent health services variables. The data were analysed using SPSS XI with odds ratios (ORs) as factors to determine the strength and direction of associations, and with 95% confidence intervals (CI) to estimate significance.

Results

Almost nine out of 10 (7343 of 8316; 88%) of the pupils completed the questionnaire. Missing data due to simple factual questions not being answered varied between 1.3% and 2.9%. The 10-item test, HSCL-10, had a higher density of missing data (3.6%) [19].

Splitting the population into two groups based on risk probability produced a LR/HR ratio of 3898/3064 or 1.3 : 1. The prevalence of ill health, healthcare visits, negative life experiences and risk-reducing factors varied between LR and HR groups (Table I).

Risk-reducing factors

All reported potential risk-reducing factors, except considering a high education, were significantly more prevalent in the LR than in the HR group (Table I). This difference between the two groups was largest for the possible risk-reducing factors "my family

Box 1. Specifications of the items addressed in the questionnaire.

Negative life experiences
General
• Heavy pressure from others to succeed/to do well at school¹ • Parents are: married/partners, not living together
Last 12 mo:
• experienced bullying at school/on the way to school² • exposed to physical violence³
Illnesses
Depression (HSCL-10 test positive), asthma, eczema
Last 12 mo: sore throat (at least 3 times)
Health services used (last 12 mo) ⁴
• Schools health service • General practitioner • Mental health practitioner (psychologist or psychiatrist)
Risk-reducing factors
• About how many hours per week spent in physical activity (in sport/doing physical exercise to an extent that you feel out of breath or sweat)?⁵ • Manage to solve serious problems⁶ • Highest education considered?⁷ • Family values opinions⁸ • Parents know where the adolescent are and what they are doing at weekends • Friends value the opinions
Items of HSCL-10
Have you in the course of the past week been troubled by feeling:
• Sudden fear for no reason • Afraid or anxious • Faint or dizzy • Tense or harassed • Guilty • Sleeplessness • Dejected • Useless, of little worth • That everything is a burden • Hopelessness for the future
→ Possible four answers: No = 1, slightly = 2, much = 3, very much = 4. ⁹

¹Dichotomized during data analysis: No // Yes, at times; Yes, often.

²Dichotomized during data analysis: Never // Sometimes; About once a week; Several times a week.

³Dichotomized during data analysis: Never // Yes, only by youth; Yes, only by adults; Yes, both youth and adults.

⁴Dichotomized during data analysis: Never, 1–3 times // ≥ 4 times.

⁵Dichotomized during data analysis: 0 hours // 1–2, 2–3 etc.

⁶Dichotomized during data analysis: Completely wrong, Fairly wrong // Fairly correct, Completely correct.

⁷Dichotomized during data analysis: University or regional college education of higher or intermediate level highest. // Other and Have not decided is in the other group.

⁸Dichotomized during data analysis: Completely, partly agree // completely, partly disagree.

⁹Positive test: A sum score with cut-off point ≥ 1.85 .

values my opinion” and “parents know where the adolescent are and what they are doing at weekends”. The difference between LR and HR groups was less pronounced for those who regularly participated in sports, and those with aspirations for a high education (Table I).

The number of significant correlations did not differ between LR and HR groups (Tables II and III). A positive answer to the statements “my family values my opinions” and “I am planning a higher education” were the items most often associated with lower

incidences of illness and healthcare-seeking behaviour (Tables II and III). Exploring the quartile groups with respect to depression, we found significant correlations for most risk-reducing factors in the 50–75% quartile (Table IV). “Family values my opinions” was associated with less depression in the three quartiles (0–75%), while “friends values my opinion” had strongest impact in the quartile with highest total risk. Those who reported that “I manage to solve serious problems” had significantly less depression (girls in the two low-risk quartiles, and both genders in the

Table I. Fifteen- and 16-year-old pupils in Oslo, Norway. Prevalences (%) of self-reported symptoms, illnesses, healthcare seeking, risk factors and risk-reducing factors in a high- and low-risk group¹.

	Low-risk group (n = 3898)		High-risk group (n = 3064)	
	Boys (n = 1910)	Girls (n = 1988)	Boys (n = 1512)	Girls (n = 1552)
Symptoms of depression last week (mean HSCL-10 score ≥ 1.85)	4	14	16	39
<i>Illnesses last year</i>				
Eczema	22	34	26	35
Asthma*	10	12	16	15
Sore throat > 3 times*	11	15	15	20
Healthcare seeking (visits last year)				
School health service*	16	27	26	37
General practitioner*	47	57	56	64
Mental health practitioner*	3	4	6	11
<i>Factors to estimate risk</i>				
Pressure to succeed	32	40	94	96
Parents not living together	20	17	43	51
Experienced bullying	5	3	28	27
Exposed to violence	13	5	50	30
Risk-reducing factors				
Physical activity*	93	90	91	86
Manage problems*	91	88	86	83
Consider high education	55	58	53	55
Family values opinions*	92	92	83	80
Parents know where they are at weekends*	88	90	82	82
Friends value opinions*	94	96	90	92

* Significant difference between low-risk and high-risk group ($p \leq 0.01$).

¹ A predicted probability based on a sum score of negative life events (Box 1) and with depression (HSCL-10 pos) as dependent variable.

two high-risk quartiles). A significant heterogenic relationship was found for doing "physical activity" and "family values my opinions" among girls (B-H; $p = 0.029$ and $p = 0.019$, respectively), and for "parents know where I am at weekends" among boys (B-H; $p = 0.017$).

Self-reported physical activity was inter-correlated with positive answers to the following statements (boys 93–94% overlap, girls 89–90% overlap): "I manage to solve difficult problems", "I have high plans for education", "my family values my opinion" and "my friends value my opinion".

Illnesses

Depressive symptoms (a positive HSCL-10 test score) were less frequent in the LR (9%) than in the HR (28%) group, and the differences became even more evident when comparing the quartile groups (Table IV). Fewer depressive symptoms were positively associated with almost all tested risk-reducing factors (Tables II and IV).

Boys who were planning to pursue higher education had a lower frequency of throat infections in both LR and HR populations (Table II). For both genders, the number of throat infections was inversely correlated with having a good relationship with their parents. For asthma and eczema, the risk-reducing factors were only

associated with less disease in the LR population (Table II).

Health services

Among girls, less use of SHS was related to having their opinion valued in their own family (LR) and with the ability to solve their own problems (HR) (Table III). For boys, to have their opinion valued by their own family was associated with fewer GP visits in the LR group, whereas planning to pursue higher education correlated with more GP visits in the HR population (Table III).

Less use of mental health practitioners was found among physically active boys in both LR and HR groups (Table III). Boys who intended to pursue higher education and boys whose opinions were valued by their own family attended mental health practices less frequently in the HR population (Table III). For girls in the LR group, less use of mental health practitioners was related to their opinions being valued by their family and friends; in the HR group, only friends' valuing of opinions was related to less use of mental health practitioners (Table III).

Discussion

Family-related qualities, e.g. family values the young person's opinions, and a motivation for higher

Table II. Risk-reducing factors¹ associated with various illnesses among 15- and 16-year-old pupils in Oslo, Norway (odds ratios (95% confidence intervals)).

	Depression (HSCL-10)		Asthma		Eczema		Throat infection	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
<i>Low-risk group²</i>								
Sport/physical exercise	0.6 (0.3-1.0)*	1.1 (0.8-1.6)	1.0 (0.5-1.8)	1.7 (1.0-3.2)	0.6 (0.4-1.0)*	1.7 (1.1-2.5)	1.4 (0.7-2.8)	0.9 (0.5-1.3)
Manage problems	0.7 (0.5-1.1)	0.5 (0.3-0.7)*	1.1 (0.7-1.9)	1.0 (0.6-1.6)	0.9 (0.6-1.3)	1.0 (0.7-1.4)	1.2 (0.7-2.1)	1.2 (0.8-1.8)
Highest education	0.6 (0.4-0.8)*	0.8 (0.6-1.0)*	0.9 (0.7-1.3)	0.9 (0.6-1.3)	1.0 (0.7-1.3)	0.7 (0.6-0.9)*	0.6 (0.4-0.9)*	1.0 (0.7-1.3)
Family values opinions	0.3 (0.2-0.5)*	0.6 (0.4-0.8)*	0.6 (0.4-1.0)*	0.6 (0.4-0.9)*	1.3 (0.9-1.9)	0.7 (0.5-0.9)*	1.0 (0.6-1.5)	1.0 (0.7-1.4)
Parents know	0.6 (0.4-0.9)*	0.8 (0.6-1.1)	1.1 (0.7-1.7)	1.6 (1.0-2.6)	0.9 (0.6-1.4)	1.1 (0.8-1.5)	0.7 (0.5-1.1)	0.8 (0.6-1.2)
Friends value opinions	0.5 (0.3-0.9)*	0.7 (0.4-1.1)	0.8 (0.4-1.5)	1.0 (0.5-2.3)	1.2 (0.7-2.1)	1.2 (0.7-2.2)	1.0 (0.5-1.9)	1.4 (0.7-3.0)
<i>High-risk group²</i>								
Sport/physical exercise	0.8 (0.4-1.5)	0.6 (0.4-0.8)*	1.5 (0.8-2.8)	1.1 (0.7-1.7)	0.9 (0.6-1.3)	1.3 (1.0-1.8)	0.8 (0.5-1.2)	1.0 (0.7-1.5)
Manage problems	0.5 (0.3-0.9)*	0.5 (0.3-0.6)*	0.9 (0.6-1.4)	1.1 (0.7-1.6)	1.0 (0.7-1.4)	0.9 (0.7-1.2)	0.8 (0.5-1.2)	0.8 (0.6-1.5)
Highest education	0.9 (0.6-1.2)	1.0 (0.8-1.0)*	0.9 (0.7-1.2)	0.9 (0.7-1.2)	1.1 (0.9-1.3)	1.1 (0.9-1.3)	0.6 (0.5-0.8)*	1.0 (0.8-1.3)
Family values opinions	0.5 (0.3-0.9)*	0.4 (0.3-0.6)*	1.1 (0.7-1.8)	1.2 (0.7-1.6)	0.9 (0.7-1.4)	1.3 (0.9-1.8)	0.7 (0.5-1.1)	0.8 (0.5-1.1)
Parents know	0.3 (0.2-0.5)*	0.6 (0.5-0.9)*	1.3 (0.8-2.0)	1.1 (0.7-1.7)	1.1 (0.8-1.5)	0.9 (0.6-1.1)	0.6 (0.4-0.8)*	0.7 (0.5-1.0)*
Friends value opinions	0.2 (0.1-0.4)*	0.5 (0.3-0.8)*	1.2 (0.5-2.5)	1.0 (0.5-2.3)	0.9 (0.6-1.6)	1.2 (0.7-2.0)	1.0 (0.5-2.0)	0.9 (0.5-2.1)

* $p \leq 0.05$.¹ Given in Box 1.² A predicted probability based on a sum score of negative life events (Box 1) and with depression (HSCL-10 pos.) as dependent variable.

education, were the risk-reducing factors most often associated with lower incidences of illness and healthcare utilization. The number of associated risk-reducing factors was lower in the HR group compared to the LR group. However, positive effects of risk-reducing factors seem to increase with increasing risk.

The results regarding associations between risk-reducing factors and the dependent variables, the incidence levels for illnesses and healthcare-seeking behaviour seemed to offer confirmation to one another. Fewer depressive symptoms and less use of psychological therapy were most frequently associated with the risk-reducing factors. A supportive family was associated with less depression when risk was low or moderate, whereas good relationships with friends seem to be more important for those at highest risk.

That less depression and less use of mental healthcare were strongly associated with good relationships with friends may reflect that isolation may represent both a symptom and a decisive factor for mental illness.

Our data cannot explain why the risk-reducing factors were stronger in boys than in girls. One assumption may be that males generally have a more fragile relation with peers and relatives.

The finding that physically active boys less often used mental care services corresponds with the finding that physically active adolescents are less likely to be depressed [12], and our results here were also most pronounced in boys.

Unexpectedly, HR boys planning to pursue a higher education attended GPs more frequently than the average, perhaps because they have greater understanding of their own health needs and a greater capacity to seek help.

Lower incidences of asthma and eczema were only associated with risk reductions in the LR group. This may point to a lower impact of these kinds of risk-reducing factors on asthma and eczema in the HR group.

Dividing the population into two groups as proxies for high and low risk enabled us to place the potential magnitudes of the different risk-reduction factors into perspective, an approach that has been used in earlier studies [5,21,22]. The sizes of the two groups were approximately equal. However, making the HR group this large may level out the differences between risks in each group. However, significantly fewer risk-reducing factors in the HR group than in the LR group may imply an increased risk-reducing effect. The results from dividing the population in quartiles supported this interpretation.

By dichotomizing each factor, they received the same weight in the regression model, although they may have different influences in real life. Using a sum score reduced this problem; however, risk factors other than the four negative life events may represent

Table III. Risk-reducing/protective factors¹ associated with healthcare seeking among 15- and 16-y-old pupils in Oslo, Norway (odds ratios (95% confidence intervals)).

	Schools health services		General practitioner		Mental health practitioner	
	Boys	Girls	Boys	Girls	Boys	Girls
<i>Low-risk group²</i>						
Sport/physical exercise	1.0 (0.2–4.4)	0.6 (0.4–1.1)	1.4 (0.6–3.2)	1.5 (0.9–2.5)	0.2 (0.1–0.6)*	0.9 (0.5–1.9)
Manage problems	1.1 (0.3–4.0)	0.8 (0.5–1.5)	1.7 (0.9–3.2)	0.9 (0.6–1.3)	1.2 (0.4–3.7)	1.0 (0.5–1.9)
Highest education	0.5 (0.2–1.2)	0.8 (0.5–1.2)	1.1 (0.7–1.6)	1.2 (0.9–1.6)	0.6 (0.3–1.3)	0.8 (0.5–1.3)
Family values opinions	1.9 (0.5–6.1)	1.3 (0.8–2.4)	0.6 (0.4–0.9)*	0.8 (0.5–1.1)	0.8 (0.3–1.9)	0.7 (0.4–1.1)
Parents know	0.6 (0.2–1.8)	0.6 (0.3–1.0)*	0.9 (0.6–1.6)	1.0 (0.7–1.4)	0.6 (0.3–1.5)	0.6 (0.3–1.0)*
Friends value opinions	0.4 (0.2–1.8)	1.2 (0.4–3.5)	1.1 (0.5–2.3)	1.1 (0.6–2.3)	1.6 (0.3–7.6)	0.4 (0.2–1.0)*
<i>High-risk group²</i>						
Sport/physical exercise	0.5 (0.1–2.3)	0.9 (0.4–1.7)	1.9 (0.8–4.4)	1.3 (0.8–2.1)	0.3 (0.1–0.8)*	0.6 (0.3–1.4)
Manage problems	0.6 (0.1–2.9)	0.3 (0.2–0.5)*	1.3 (0.7–2.6)	0.7 (0.5–1.0)	0.8 (0.3–2.1)	0.9 (0.4–2.1)
Highest education	0.6 (0.3–1.5)	0.9 (0.6–1.4)	1.5 (1.1–2.1)*	1.2 (0.9–1.5)	0.1 (0.1–0.4)*	1.3 (0.7–2.2)
Family values opinions	–	0.7 (0.3–1.4)	1.3 (0.7–2.6)	1.5 (0.9–2.5)	0.3 (0.1–0.6)*	0.7 (0.3–1.6)
Parents know	1.9 (0.3–14)	2.1 (0.8–5.2)	0.9 (0.5–1.4)	0.8 (0.5–1.2)	0.3 (0.1–0.6)*	1.0 (0.4–2.3)
Friends value opinions	–	0.7 (0.2–2.1)	1.3 (0.5–3.4)	0.6 (0.3–1.9)	1.2 (0.2–9.5)	0.3 (0.1–0.8)*

* $p \leq 0.05$.¹ Given in Box 1.² A predicted probability based on a sum score of negative life events (Box 1) and with depression (HSCL-10 pos.) as dependent variable.

a considerable portion of a person's total risk. This objection should be considered when interpreting this result.

The risk-reducing factors showed high correlation, which may raise questions about the decisiveness of each factor. On the other hand, each risk-reducing factor provided a particular profile with less illness and lower health-seeking behaviour. Each factor, therefore, seems to have its own impact. Additionally, a summative effect may be possible.

Almost complete data sets for a total population of 15- and 16-y-olds in Oslo implies that our findings are representative for Oslo in particular and may also be representative of other urban settings in other comparable countries [23].

There are several limitations to this cross-sectional study. We cannot conclude, for example, that the disclosed associations represent causal relationships. However, a number of the Bradford Hill criteria were met [24], e.g. significant associations, results similar

Table IV. Reduced risk (OR; 95% CI) for depression (positive HSCL-10 score¹) as dependent variable associated with presence of different risk-reducing factors in pupils exposed to different levels (quartiles) of negative life experiences² among 15–16-y-old pupils in Oslo, Norway.

	Boys		Girls	
	0–25% quartile group		25–50% quartile group	
Number of pupils	968		991	
Pos. HSCL-10 score (%)	1.7		10.4	
Sport/physical exercise	0.5 (0.3–1.0)		1.2 (0.8–2.0)	
Manage problems	0.7 (0.4–1.1)		0.5 (0.3–0.8)*	
Highest education	0.7 (0.4–1.0)*		1.0 (0.7–1.4)	
Family values opinions	0.4 (0.2–0.6)*		0.6 (0.4–0.9)*	
Parents know	0.8 (0.5–1.2)		0.9 (0.6–1.4)	
Friends value opinions	1.0 (0.5–1.7)		1.0 (0.6–1.8)	
	50–75% quartile group		75–100% quartile group	
Number of pupils	741		585	
Pos. HSCL-10 score (%)	9.0		23.8	
Sport/physical exercise	0.6 (0.4–0.9)*		1.1 (0.8–1.5)	
Manage problems	0.6 (0.4–1.0)*		0.5 (0.3–0.6)*	
Highest education	0.7 (0.6–1.0)*		1.2 (0.3–5.6)	
Family values opinions	0.3 (0.2–0.4)*		0.5 (0.1–2.7)	
Parents know	0.5 (0.4–0.7)*		0.8 (0.6–1.1)	
Friends value opinions	0.7 (0.5–1.1)		0.1 (0.0–0.7)*	

* $p \leq 0.05$.¹ A cut-off point of > 1.85 on the HSCL-10 positive test (Box 1).² A predicted probability based on a sum score of negative life events (Box 1) and with depression (HSCL-10 pos.) as dependent variable.

to those of the resilience research [1], a reasonable relation in time, and HR quartiles having more and stronger associations than LR quartiles signifying a possible "dose response effect". This supports that the link between risk-reducing factors and reduced illness and healthcare seeking is valid. There is, however, a possibility of confounding because various lifestyle factors were not addressed. In addition, depression may influence both negative life experiences and some risk-reducing factors. Furthermore, the ability to pay for healthcare was not measured, which may also influence healthcare utilization patterns. However, "poor economy in own family", or "a parent (supporter) is unemployed or qualified for disability pension", had only minor or no effects on healthcare-seeking behaviour. This finding is consistent with earlier studies in the Nordic countries that demonstrated that socio-economic factors have little importance in explaining the use of GP services [23].

In conclusion, the correlation between risk-reducing factors and the incidence of illness and health-seeking behaviour is evident and may represent causal relationships. Knowledge about the manner in which different risk-reducing factors may modify illness and healthcare utilization, and the increased risk-reducing effect in the HR group, is relevant for planners and healthcare workers. More research is needed to establish evidence-based intervention strategies directed towards adolescents at particular risk.

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12 Article IV

Children and adolescents

Depressive symptoms in adolescent pupils are heavily influenced by the school they go to. A study of 10th grade pupils in Oslo, Norway

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Background: A school is generally acknowledged to be a key setting for promoting pupils' health and well-being. **Methods:** Data from a cross-sectional questionnaire study conducted with all 10th grade pupils in 46 public schools. Depressive symptoms was defined by a positive score on Hopkin's Symptom Check List-10 (HSCL-10). Two composite variables expressing risk were established: (i) presence of negative factors (PNF), consisting of self-reported pressure to succeed, sexual violation, and exposure to bullying and violence; and (ii) absence of positive factors (APF), comprising respondents' self-reported physical activity, educational aspirations, and family's valuing their opinions. **Results:** Out of 7505 pupils, complete data were obtained for 6207. The prevalence of symptoms of depression varied greatly among different schools (boys, from 0 to 19%; girls, from 3.3 to 39%). The PNF varied from 12.3 to 45.5% for boys, and from 4.2 to 38.8% for girls. Corresponding figures for APF were 2.4–23.1% for boys and 4.3–37.5% for girls. Among boys, we found significant associations between PNF and symptoms of depression, odds ratio (95% CI) 4.5 (3.5–5.8), and between APF and depressive symptoms, 3.1 (2.3–4.1). For girls, corresponding odds ratios were 3.5 (2.9–4.2) and 2.1 (1.7–2.6), respectively. **Conclusions:** The proportion of pupils with depressive symptoms varies greatly among Oslo public schools. This variation is associated with features of the pupils' social context.

Keywords: adolescent, depressive symptoms, life change events, pupil, schools

A school is generally acknowledged to be a key setting for promoting pupils' health and well-being.^{1–4} This assumption forms the basis for the European Network of Health Promoting Schools, organised in 1991 by the World Health Organisation, the Council of Europe, and the European Commission.⁵ Their strategy was founded on a social model of health and the Ottawa Charter from 1986⁶ which focus on achieving equity and reducing differences in current health status. More than 40 countries, including Norway, participate in this European collaboration, with the goal to 'disseminate models of good practice and make opportunities for health promotion' within schools.⁵ The impact of this political plan of action is not very well explored.

A decade after this programme was launched, it may be relevant to compare the prevalence of depressive symptoms among adolescents attending different schools in order to explore the possibility that the social context may account for some of the variation. Depressive symptoms are associated with a number of negative life experiences,^{7–10} and cumulative adverse experiences may place young people at risk.^{11,12} In a study comparing two US schools that differed in their level of violence, for example, pupils at the high-prevalence school reported a higher incidence of symptoms of depression than did pupils at the low-prevalence school.¹³ More encouragingly, depressive symptoms may also be influenced by risk-reducing

factors,¹⁴ thus enabling a positive school environment to reduce depression among adolescents.² Knowledge about such differences may be relevant for planning local measures to promote good health⁵ in high-risk schools,² for alerting parents, teaching staff,¹⁵ and health care workers.^{16,17}

The aim of this study was to explore differences in the prevalence of depressed pupils in different public schools in Oslo, and to examine the relationships between depressive symptoms and two sets of risk factors individually and for each school.

Materials and methods

The data reported in this article constitute part of a youth study in the Greater Oslo Health Survey, a classroom survey conducted among 10th year pupils (15–16 years of age) at all Oslo schools in 2000 and 2001. The study was run by the Norwegian Institute of Public Health in collaboration with the University of Oslo and the Municipality of Oslo.¹⁸ Permission was received from the Norwegian Data Inspectorate and the Regional Committee for Research Ethics approved the study.

Almost all Norwegian schools are public, run by the municipality, and recruiting pupils from the local geographical area. A limited number, however, are private religious or non-religious schools.

School authorities, school health employees, parents, and pupils were informed about the survey before its implementation, and parents could withdraw their children from participation. Trained field workers visited each classroom, explained the self-administered questionnaire, and gathered the completed forms. Blank questionnaires were left behind for absent pupils. Furthermore, a blank questionnaire and a stamped, addressed envelope were sent to the homes of pupils who did not respond. The questionnaire addressed negative life experiences, state of

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physical and mental health, health care utilization, and possible health promoting issues.

Depressive symptoms was defined as an average score of 10 items ≥ 1.85 [Hopkin's Symptom Check List-10 (HSCL-10) test; table 1]. A composite risk variable encompassing presence of negative factors (PNF) was created by summing four life events that were identified in previous reports^{18,19} as being associated with illness and health care utilization: pressure to succeed, exposure to bullying, violence, and sexual violation (table 1). The resulting composite variable was dichotomised, thereby defining anyone who had experienced at least two of the four risk factors as being at risk (positive PNF score). A second composite variable comprised by absence of positive factors

Table 1 Specifications of the items addressed in the questionnaire

Negative life experiences
General
Heavy pressure from others to succeed/ to do well at school ^a
Last 12 months:
Experienced bullying at school/on the way to school ^b
Exposed to physical violence ^c
Experienced sexual violence (e.g. indecent exposure, pawing, unwilling sexual intercourse, etc.) ^d
Positive risk-reducing factors
About how many hours per week spent in physical activity (in sport/do physical exercise to an extent that you feel out of breath or sweat)? ^e
Highest education considered? ^f
Family values opinions ^g
Items of HSCL-10
Have you in the course of the past week been troubled by feeling (four possible answers: Not = 1; slightly = 2; much = 3; very much = 4):
Sudden fear for no reason
Afraid or anxious
Faint or dizzy
Tense or harassed
Guilty
Sleeplessness
Dejected
Useless, of little worth
That everything is a burden
Hopelessness for the future

a: Dichotomised during data analysis: No/Yes, at times; Yes, often

b: Dichotomised during data analysis: Never/Sometimes; About once a week; Several times a week

c: Dichotomised during data analysis: Never/Yes, only by youth; Yes, only by adults; Yes, both youth and adults

d: No/Yes

e: Dichotomised during data analysis: 0 h/1–2; 2–3; etc.

f: Dichotomised during data analysis: University or regional college education of higher or intermediate level highest/ Other and Have not decided

g: Dichotomised during data analysis: Completely; Partly agree/Completely disagree, Partly disagree

(APF) created by three important factors related to less health care attendance and lower rates of illness,²⁰ namely the value parents placed on the opinions of our respondents, educational aspirations, and self-reported physical activity (table 1).

The absence of one or more of these factors defined the respondent as being at risk (positive APF score). The cut-off points for PNF and APF, respectively, were chosen so that 15–30% of the pupils scored positive on each composite factor. Anyone lacking answers to one or more of the questions comprising a composite factor was registered as missing on this factor.

The data were analysed using mainly SPSS 12.0. Each gender was analysed separately. Confidence intervals for proportions were estimated using the normal approximation method. The proportion in different schools of pupils' positive score on the two risk factor variables and the HSCL-10 test were compared using Pearson's chi-squared tests. Logistic regression modelling was performed, relating the odds of a positive HSCL-10 score to the PNF and APF scores, respectively.

The multilevel modelling was performed in MLwiN 1.10, where the estimation procedure was second order penalized quasi-likelihood restricted iterative generalized least squares.

Among the 8316 pupils attending 10th grade during 2000 (62 schools) and 2001 (60), 7329 (88%) filled in the questionnaire. Included in this study were 46 ordinary public schools with an average of 163 pupils (range 56–385), and with a total of 7505 pupils (3802 boys, 3684 girls, 19 with missing data regarding gender).

Results

Missing data occurred through omissions on the HSCL-10 test (3.6%), PNF (5.6%), and APF (3.9%). Of the remaining pupils, 1248 tested HSCL-10 positive, 1048 had a positive PNF score, and 1756 had a positive APF score.

All over prevalence (95% CI) of symptoms of depression among the pupils was 9.3% (8.3–10.3) for boys and 26% (23.4–27.7) for girls (table 2). Corresponding proportions of boys and girls with a positive PNF score were 27.1 (25.4–29.6) and 23.1% (21.2–25.7), and with a positive APF score 13.1 (11.9–14.3) and 17.3% (16.2–20.2), respectively (table 2).

Within individual schools, the mean prevalence of pupils with symptoms of depression was 9.6% (range 0–19.0%) for boys and 25.6% (3.3–39.0%) for girls (table 3). The mean prevalence of positive PNF was 27.5 (12.3–45.5) and APF 13.7 (2.4–23.1) for boys and 23.4 (2.4–38.8) and 18.2 (4.3–37.5), respectively, for girls.

Table 2 10th grade public school pupils ($n = 7505$)^a in Oslo: prevalence (prev) of depressive symptoms^b, PNF^c, and APF^d with 95% confidence intervals

	Boys ($n = 3802$)			Girls ($n = 3684$)		
	<i>n</i>	Prev (%)	95% CI	<i>n</i>	Prev (%)	95% CI
HSCL-10	3163	9.3	8.3–10.3	3171	26.0	23.4–27.7
PNF	3131	27.1	25.4–29.6	3197	23.1	21.2–25.7
APF	3099	13.1	11.9–14.3	3108	17.3	16.2–20.2

a: 19 with missing data regarding gender

b: Symptoms of depression defined as ≥ 1.85 on HSCL-10

c: PNF consisting of self-reported pressure to succeed, sexual violation, and exposure to bullying and violence

d: APF consisting of respondents' self-reported physical activity, educational aspirations, and family's value of their opinions

Table 3 The 10th grade public schools in Oslo ($n = 7505$)^a: mean prevalences (%) within schools of symptoms of depression (HSCL-10)^b, PNF^c, and APF^d, with ranges and *P*-values from chi-squared tests

	Boys (46 schools)			Girls (46 schools)		
	Mean prev	Range	<i>P</i>	Mean prev	Range	<i>P</i>
HSCL-10	9.6	0–19	0.186	25.6	3.3–39.0	0.026
PNF	27.5	12.3–45.5	0.046	23.4	4.2–38.8	<0.001
APF	13.7	2.4–23.1	0.016	18.2	4.3–37.5	<0.001

a: 19 with missing data regarding gender

b: Symptoms depression defined as ≥ 1.85 on HSCL-10

c: PNF consisting of self-reported pressure to succeed, sexual violation, and exposure to bullying and violence

d: APF consisting of respondents' self-reported physical activity, educational aspirations, and family's value of their opinions

Table 4 10th grade public school pupils in Oslo ($n = 7505$)^a: the relation between symptoms of depression^b, and PNF^c and APF^d, odds ratio with 95% confidence interval and significance level

	Boys			Girls		
	OR	95% CI	<i>P</i>	OR	95% CI	<i>P</i>
PNF	4.5	3.5–5.8	<0.001	3.5	2.9–4.2	<0.001
APF	3.1	2.3–4.1	<0.001	2.1	1.7–2.6	<0.001

a: 19 with missing data regarding gender

b: Symptoms of depression defined as a mean score ≥ 1.85 on HSCL-10

c: PNF consisting of self-reported pressure to succeed, sexual violation, and exposure to bullying and violence

d: APF consisting of respondents' self-reported physical activity, educational aspirations, and family's value of their opinions

For girls, chi-squared tests showed significant variations in the prevalences of pupils with symptoms of depression by individual school ($P = 0.03$), and positive PNF ($P \leq 0.001$) and APF ($P \leq 0.001$) scores (table 3). For boys, the trend towards variation in symptoms of depression between different schools was not significant ($P = 0.19$), but the PNF and APF factors both varied significantly ($P = 0.046$ and 0.016).

Using logistic regression modelling, we found significant relationships between symptoms of depression and the risk factors for both genders (table 4). For boys, the odds ratio (95% CI) for PNF was 4.5 (3.5–5.8). The odds ratio for APF was 3.1 (2.3–4.1). For girls, corresponding figures were 3.5 (2.9–4.2) for PNF and 2.1 (1.7–2.6) for APF (table 4).

Subsequently, the corresponding multilevel logistic regression model was fitted, where both the constant and effects of PNF and APF were allowed to vary at school level. The results of this analysis were approximately identical to the ones found by the one-level analysis, both with respect to effect sizes and standard errors. None of the factor-effects were found to vary between the different public schools.

Discussion

For female pupils, our data support that their school is independently associated with depressive symptoms, also when controlling for the positive and negative factors investigated. A similar tendency, however not significant, was observed for male pupils. The variation of pupils with symptoms of

depression was associated with features of the pupils' social context. For both genders, the positive and negative factors investigated had significant effects on the odds of a positive HSCL-10 score, and these relations seem to be consistent between schools.

In some schools, more than one in three pupils had a positive HSCL-10 score, raising the question that the test used may in general be too sensitive, or that the cut-off point for a positive score should be gender-adjusted.¹⁸ However, the HSCL-10 test has been validated for 16- to 24-year-olds, and against the more comprehensive HSCL-25.²¹ Jones and Kafetios²² used the HSCL-25 to screen for mental health problems among 337 pupils 13–15 years of age in Bosnia. In a subsample ($n = 40$) comprised of high and low test scorers, their test results corresponded well with a qualitative assessment in slightly less than four out of five cases. Even if the HSCL-10 test is not validated in 15-year-olds in a comparable setting, it is nevertheless to be expected that a large proportion of the pupils with a positive HSCL-10 score do experience depressive symptoms to an extent that reduce their quality of life and school achievements.^{23–25} The high-prevalence schools were contrasted by schools at the other end of the scale, where only 1 in 20 pupils had a positive HSCL-10 score.

The school context plays a significant role in the lives of pupils.^{26,27} Konu *et al.*³ have recently completed a study of students' well-being, in which the school context was comprised by 56 independent variables. Our study utilized fewer factors, however, in its composite dichotomous variables, PNF and APF. One essential question is, therefore, whether the four factors representing PNF and the three factors representing APF actually characterize a considerable portion of the social context in each school. Even if the seven factors represent a significant proportion of the pupils' potential risk factors for symptoms of depression, they obviously do not represent the total risk, which undoubtedly also should include factors like schoolwork stressors, friendship problems,⁷ pupils' well-being in the classroom, curriculum, the nature of the school–community interface,¹² parent–school collaborations,² and none of which were included in the independent variables utilized in this study. However, the seven chosen traits are each significantly associated with symptoms of depression¹⁸ and can in some way be influenced by the school setting. Because the two sets of risk factors were strongly associated with the odds for symptoms of depression in each school, we believe that the two factors probably may be useful descriptors of the social context in a school. For all the three variables, symptoms of depression (HSCL-10), PNF, and APF, the prevalence fluctuations differed between boys and girls, because they experience the school context differently.¹⁸

Adolescents can be an accurate source of health data, but the reliability of adolescent reporting is influenced by such question characteristics as sentence complexity and time frame.²⁸ There were, however, few missing data in this study, suggesting that the pupils understood the questions, hence contributing to the reliability and internal validity of the study.

The high participation rate within the population of interest suggests that our findings are representative for 10th year pupils in Oslo public schools, and probably also for pupils in similar urban settings in Norway and comparable countries.

As this was a cross-sectional study, we cannot explore causal relationships between the depressive symptoms and the investigated risk factors. For example, we cannot exclude confounding factors like, e.g. disposition of the victims, elements of their life style, and other factors in their environment.²⁹ Even though both household income of pupils' families and the financial resources of a school have been related to depressive symptoms among adolescents in the US,²⁷ educational level and socioeconomic status of the adolescents' families only accounted for 1% of the variation in pupils' general subjective well-being in

Finland.³ The large variation in the prevalence of symptoms of depression in different Oslo schools could not be predicted by their geographical location according to well known socioeconomic differences.¹⁸ Possible explanations for this may be the relative social equity in Norway, and that the influence of peers in this period of life probably outweighs socioeconomic status.⁵

Although the associations do not tell us if the risk factors preceded symptoms of depression, there is a suggestion of chronological order in the fact that the HSCL-10 test asked respondents to report their symptoms during the previous week while the risk-factor questions were related either to experiences during the previous year or to experiences not anchored in time.^{18,19} Kim *et al.*²⁹ have showed that stressful life experiences and internalization of symptoms are mutually interrelated over time.

Although we did not analyse an exhaustive number of risk factors, the PNF and APF were significant factors influencing the pupils' psychological status. Because symptoms of depression covaried so strongly with both PNF and APF, the HSCL-10 test may itself be an instrument for investigating features of the social context related to a school. However, not only these factors but also a range of different aspects need to be explored at the schools with high prevalences of pupils with symptoms of depression.

Knowledge about the prevalence of depressed pupils in a school may be a necessary prerequisite for effective involvements for school authorities and health workers. Ten years after the introduction of the European Network of Health Promoting Schools, the number of pupils with symptoms of depression varies greatly among Oslo schools. Among the high-prevalence schools there is a need to explore the possibilities of implementing local measures to promote good health. Alerting and educating school employees, health care workers and parents can obtain this. More research is needed to increase the knowledge about the impact of the context on adolescents' mental health.

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Key points

- The aim was to explore differences in the prevalence of depressed pupils in schools and the relationships with two sets of risk factors.
- The proportion of pupils with depressive symptoms varies greatly among Oslo public schools.
- For female pupils, their school is associated with depressive symptoms, and for male there is found a similar tendency, however not significant.
- For both genders, the positive and negative factors investigated had significant effects on depressive symptoms consistent between schools.
- Ten years after the introduction of the European Network of Health Promoting Schools, there is still a need implementing measures to promote good health.

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13 Appendix

The Oslo Health Survey is being carried out
In co-operation with:

Oslo Municipality

Department of Primary Health and
Social Affairs
City Hall, 0037 OSLO.
Tel.: 22 86 16 00



The University of Oslo

Institute of General Practice and
Community Medicine
P.O.Box 1130 Blindern, 0317 OSLO.
Tel.: 22 85 05 50.



The National Health Screening Service
P.O.Box 8155 Dep., 0033 OSLO
Tel. 22 24 21 00.

Helse-undersøkelsen i Oslo

The Oslo Health Survey

YOUTH

Information to those of you who will
be 15/16 in 2000

Contact:
Tove Eie Tlf. 22 24 21 22
E-mail: toveeie@online.no

Hello!

What's life like?

What's your health like at present?

What does it feel like to be a young person in Oslo?

These are some of the questions we hope the Oslo Health Survey will help us to answer. The information obtained will be used for example, to find out what things are important for young people's health and well-being, both in your own district and in Oslo as a whole. The results will be used to plan a better health service, and to find out more about the causes of illness.

You now have a chance to help to plan the future!

Only teenagers who are 15 or 16 years old are invited to take part.

This is the first time we invite Oslo's teenagers to take part in health survey.

Several adult age groups will also be invited to participate in the Oslo Health Survey, altogether about 50,000 persons.

How will the survey be take place?

The survey will be carried out during school hours, and we shall ask you to fill in two questionnaires. These contain questions about illness and health, diet, exercise and physical activity, your local environment, and what your life is like. You will not be asked to have a health check.

How will the results be used?

Before you fill in the forms, we ask you to give your approval (sign a Declaration of Consent). This states that you permit us to use your answers for planning and research purposes. We also ask you to allow us to contact you again later, to invite you to take part in a new survey if

relevant. The data will be treated in strict confidence. No specific time limit has been set for how long the data can be stored. You can withdraw from the survey at any time. In this case you must inform us in writing. If the Norwegian Data Inspectorate approves, the data can be compared with data in other registers. Examples are data contained in other health, social welfare or disease registers, or obtained from population censuses. The questionnaires do not carry your name and personal identification number, but a code that can only be read by computer.

Participation in the survey is voluntary.

Participation in the survey is voluntary. We hope you will take part. It is very important to include as many as possible. Those who do not want to participate will have ordinary schooling while the survey is going on.

Who is behind the survey?

We in the National Health Screening Service (Statens helseundersøkelser - SHUS) are co-operating with Oslo municipality and the University of Oslo. The Norwegian Data Inspectorate has approved the survey. Oslo's Director of Schools recommends the survey.

You should know that:

- All persons working on the health survey have signed an oath of secrecy
- The results will be used in planning and research and will be treated as strictly confidential.
- Your parents have been informed about the survey.
- It is important that especially you decide to take part.

The Oslo Health Survey is being carried out
in co-operation with:

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The National Health Screening Service
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Tel. 22 24 21 00.



Contact: Tove Eie
Tel. 22 24 21 22
toveeie@online.no

Helse-undersøkelsen i Oslo

The Oslo Health Survey

YOUTH

Information to parents/providers
of youths who will be 15/16 years in 2000

Attach the label with
name and personal
identification number

DECLARATION OF CONSENT

for participants in the Oslo Health Survey

YOUTH

I have received information on the part of the Oslo Health Survey referring to youth. I have been informed about the purpose of the survey. I have also been informed that the information about myself will be treated confidentially and that the survey has been approved by the Norwegian Data Inspectorate; also that the survey has been submitted to the Regional Committee for Medical Research Ethics. I have further been informed that no specific time limit has been set for how long the information on me can be stored. I can later ask to be deleted from the register, without giving any reason for my decision.

In this case, the request must be sent in writing to the National Health Screening Service.

1. **I agree that that my answers can be used in planning and research.**
2. **I agree that I can be contacted later and invited to participate in another survey.**
3. **I agree that, after approval has been obtained from the Norwegian Data Inspectorate, the data can be compared with other information on myself in other data registers, such as other health, social welfare or disease registers, or with data from, for example, population censuses.**

You can cross out any item or items to which you do not wish to give your consent.

Pupil's signature

Date

Date filled in:

Day

Month

Year

Do not write here:

1.3 (skade)

4.8 (rusmidler)

8.1 (utdanning - annet)

9.5 (far - født)

9.6 (mor - født)

9.7 (far - yrke)

9.7 (mor - yrke)

12.5 (prevensjon)

12.6 (p-pille merke)

U1. OWN HEALTH

1.1 What is your present state of health? (One cross only!)

Poor

Not so good

Good

Very good

1

2

3

4

1.2 Have you, or have you had? (Cross off for each line)

YES

NO

Asthma

Hay fever (pollen allergy allergic reaction, running nose, smarting eyes

Eczema.....

Diabetes

1.3 Have you had during the last 12 months (Cross off for each line)

Inflamed ear.....

Sore (inflamed) throat (At least 3 times).....

Bronchitis or pneumonia

Mental disorder for which for you sought help.....

Serious injury or illness.....

If you answered "YES"; what kind of serious injury or illness was it:

1.4 Do you have the following functional disability, Yes, Yes (Cross off for each line)

No

a little

a lot

Impaired mobility.....

Impaired vision.....

Impaired hearing.....

1.5 Have you, in the course of the last 12 months, been troubled several times by pain in: (Cross off for each line)

YES

NO

Head (headache, migraine etc.).....

Neck/shoulder

Arms/legs/knees.....

Stomach.....

Back

If you answered "NO" to all the questions under 1.5: Go straight to U2 (next page)

1.6 Did this pain cause you to stay home from school?

State also the approx. number of school days lost during the last 12 months: (One cross only!)

No

Yes, 1-2 days

Yes, 3-5 days

Yes, 6-10 days

Yes, more then 10 days

1

2

3

4

5

YES

NO

1.7 Did the pain lead to reduced activity in your spare time?

U2. DENTAL HEALTH

- 2.1 Do you think that you have better or poorer teeth than other young people of your age? (One cross only!)

Better ☐ 1 Same as most ☐ 2 Poorer ☐ 3 Do not know ☐ 4

- 2.2 Do you care about having good teeth? (One cross only!)

Yes, a lot ☐ 1 Yes, a little ☐ 2 No ☐ 3

- 2.3 How often do you brush your teeth? (One cross only!)

Several times a day ☐ 1 Once a day ☐ 2 Every other day ☐ 3 Less than every other day ☐ 4

- 2.4 Have you had toothache due to a rotten tooth (cares)? (Cross off more than one alternative if applicable)

Yes, but before I started school ☐ 1 Yes, after I started school ☐ 2 No, never ☐ 3 Do not know ☐ 4

U3. EXERCISE AND PHYSICAL ACTIVITY

- 3.1 Out of school hours: How many times per week do you take part in sport/do physical exercise to an extent that you feel out of breath or sweat?

times per week

- 3.2 About how many hours per week do you spend on this activity?

0 hours ☐ 1 1-2 hours ☐ 2 3-4 hours ☐ 3 5-7 hours ☐ 4 8-10 hours ☐ 5 11 hours or more ☐ 6

YES NO

- 3.3 Do you take part in competitive sport? (Individually or as part of a team)

☐ YES ☐ NO

- 3.4 Do you use the countryside (woods and fields) for walking?

Never ☐ 1 Yes, but less than once a month ☐ 2 Yes, once a month or more ☐ 3

Summer: ☐ 1 ☐ 2 ☐ 3

Winter: ☐ 1 ☐ 2 ☐ 3

- 3.5 Outside school hours: How many hours per school day (Monday to Friday) do you sit, on average, in front of a TV, video and/or PC (games and Internet)?

Up to 1 hour ☐ 1 1-2 hours ☐ 2 3-5 hours ☐ 3 More than 5 hours ☐ 4

- 3.6 How do you usually get to school during the summer half-year? (One cross only!)

By bus/train etc.. (public transport) ☐ 1

By car/scooter..... ☐ 2

By bicycle..... ☐ 3

On foot..... ☐ 4

- 3.7 How far do you live from school?

Less than 2 km ☐ 1 2-4 km ☐ 2 More than 4 km ☐ 3

U4. SMOKING, INTOXICANTS AND DOPE

- 4.1 Do you smoke, or have you smoked earlier? (One cross only!)

No, never ☐ 1 Yes, but I have stopped ☐ 2 Yes, at times ☐ 3 Yes, daily ☐ 4

If you answered "NO, NEVER", go straight to item 4.3.

- 4.2 How old were you when you started to smoke? yrs

4.3 Do you use or have you used smokeless tobacco (snuff, chewing tobacco or similar)? *(One cross only!)*

No, never	Yes, but I have stopped	Yes, at times	Yes, daily
☐ 1	☐ 2	☐ 3	☐ 4

4.4 Do any of the people you live with smoke? *(Put one or more crosses, as applicable)*

Yes, mother	Yes, father	Yes/sibling (brother/sister)	Yes, other	No
☐	☐	☐	☐	☐
			Yes	No
			☐	☐

4.5 Have you ever drunk alcohol? ☐ Yes ☐ No
(E.g. alcoholic beer, alco-pop, wine, spirits or "hooch" (home-distilled liquor))

If you answered "NO", go straight to item 4.8.

4.6 Have you every drunk so much alcohol that you got drunk? *(One cross only!)*

No, never	Yes once	Yes 2-3 times	Yes 4-10 times	Yes, more than 10 times
☐	☐	☐	☐	☐

4.7 About how often in the course of the past year have you drunk alcohol? *(One cross only!)*
(Low-alcohol beer and non-alcoholic beer do not count)

4-7 times a week	2-3 times a week	ca. once a week	2-3 times a month	About once a month
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
A few times in the past year	Have not drunk alcohol during the past year	Have never drunk alcohol		
☐ 6	☐ 7	☐ 8		

4.8 Have you ever tried doping agents? *(One cross only!)*

No never	Yes, once	Yes, several times	Yes, I use one regularly
☐ 1	☐ 2	☐ 3	☐ 4

U5. FOOD, DRINK AND EATING HABITS

5.1 How often do you normally eat these foods?

(Cross off for each line)

	Seldom/ never	1-3 t pr.mth	1-3 t. pr.wk	4-6 t. pr.wk	1-2 t. pr. day	3 t. or more pr. day
Fruit, berries.....	☐	☐	☐	☐	☐	☐
Cheese (all kinds).....	☐	☐	☐	☐	☐	☐
Potatoes	☐	☐	☐	☐	☐	☐
Cooked vegetables	☐	☐	☐	☐	☐	☐
Raw vegetables/salad.....	☐	☐	☐	☐	☐	☐
Oily fish (e.g. salmon..... trout, mackerel, herring)	☐	☐	☐	☐	☐	☐
Chocolates/sweets.....	☐	☐	☐	☐	☐	☐
Potato chips etc.....	☐	☐	☐	☐	☐	☐
	1	2	3	4	5	6

5.2 How much do you normally drink of the following?

(Cross off for each line)

(1/2 liter = 3 glasses)

	Seldom/ never	1-6 glasses pr.week	1 glass pr.day	2-3 glasses pr. day	4 glasses or more pr. day
Full-cream milk, kefir, yoghurt	☐	☐	☐	☐	☐
Semi-skimmed milk, "Cultura", low-fat yoghurt	☐	☐	☐	☐	☐
Skimmed milk (sour/sweet).....	☐	☐	☐	☐	☐
Cola/"fizzy" drinks, with sugar	☐	☐	☐	☐	☐
Cola/"fizzy" drinks, without sugar.....	☐	☐	☐	☐	☐
Fruit juice	☐	☐	☐	☐	☐
Diluted fruit juice.....	☐	☐	☐	☐	☐
Water	☐	☐	☐	☐	☐
	1	2	3	4	5

5.3 What kind of fat do you most often use on your bread?

(One cross only!)

Butter/hard margarine	Soft/light margarine	Oils	Do not use fat on bread
☐ 1	☐ 2	☐ 3	☐ 4

5.4 How often do you eat the following meals in an ordinary week?

(Cross off for each line)

	Seldom/ never	1-2 times pr.wk	3-4 times pr. wk	5-6 times pr. wk	Daily
Breakfast	☐	☐	☐	☐	☐
Lunch/packed lunch	☐	☐	☐	☐	☐
Dinner	☐	☐	☐	☐	☐
	1	2	3	4	5

5.5 How much money do you spend per week on "goodies", snacks,

Coke/"fizzy" drinks and fast food? (One cross only!)

0-25 kr. 26-50 kr. 51-100 kr. 101-150 kr. 151-200 kr. more than 200 kr.

☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6
----------------------------	----------------------------	----------------------------	----------------------------	----------------------------	----------------------------

5.6 Do you take the following food supplements?

Yes, daily Sometimes No

Cod liver oil, cod liver oil capsules, fish oil capsules?	☐	☐	☐
Vitamin- and/or mineral supplement?	☐	☐	☐

5.7 Have you ever tried to slim? (One cross only!)

No, never Yes, earlier on Yes, now Yes, all the time

☐ 1	☐ 2	☐ 3	☐ 4
----------------------------	----------------------------	----------------------------	----------------------------

If you answered "NO, NEVER", go straight to item 5.9.

5.8 What have you done in order to lose weight?

(Cross off for each line)

	Never	Seldom	Often	Always
I eat less	☐	☐	☐	☐
I fast	☐	☐	☐	☐

I exercise more..... ☐ ☐ ☐ ☐

I vomit ☐ ☐ ☐ ☐

I use laxatives or diuretics..... ☐ ☐ ☐ ☐

I take "filling" or hunger-reducing pills..... ☐ ☐ ☐ ☐

1 2 3 4

5.9 What did you weigh when you weighed yourself last? whole kg

5.10 What was your height when you measured it last? whole cm

5.11 What do you think about your weight? (One cross only!)

Weight is OK	Weigh a bit too much	Weigh far too much	Weigh not quite enough	Weigh far too little
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

5.12 I care a lot about my weight. (One cross only!)

Agree ☐ Tend to agree ☐ Do not agree ☐

5.13 What weight would you be satisfied with at present (the weight that would please you)? whole kg

5.14 Have you been treated for eating disorders? (One cross only!)

No	No, but I should like help	Yes
☐ 1	☐ 2	☐ 3

U6. STRESSES AND COPING

6.1 Below is a list of various problems. Have you been troubled by any of these in the course of the past week (including today)?

(Cross off for each line)

	Not troubled	Slightly troubled	Much troubled	Very much troubled
Sudden feeling of fear for no reason.....	☐	☐	☐	☐
Feel afraid or anxious.....	☐	☐	☐	☐
Feel faint or dizzy.....	☐	☐	☐	☐
Feel tense or harassed.....	☐	☐	☐	☐
Feel guilty (easily blame yourself)	☐	☐	☐	☐
Sleeplessness	☐	☐	☐	☐
Feel depressed, dejected (sad).....	☐	☐	☐	☐
Feel useless, of little worth.....	☐	☐	☐	☐
Feel that everything is a burden	☐	☐	☐	☐
Feeling of hopelessness for the future	☐	☐	☐	☐
	1	2	3	4

6.2 Below are some statements:

(Cross off for each line)

	Completely wrong	Fairly wrong	Fairly correct	Completely correct
I always manage to solve serious problems if I try hard enough.....	☐	☐	☐	☐
If someone opposes me, I manage to find ways and means of getting what I want	☐	☐	☐	☐
If I have a problem and and are completely stuck I usually manage to find a way out.....	☐	☐	☐	☐
I am quite sure that I would be able to tackle unexpected occurrences in an effective manner.....	☐	☐	☐	☐
I stay calm when I meet difficulties because I trust in my ability to cope/to succeed.....	☐	☐	☐	☐
	1	2	3	4

6.3 Have you in the course of the last 12 months experienced any of the following? (Cross off for each line)

	YES	NO
A parent (supporter) has become unemployed or qualified for disability pension.....	☐	☐
	☐	☐

You, yourself, have been seriously ill or injured.....

Someone you are close to has been seriously ill or injured.....

Someone close to you has died.....

Sexual violation (e.g. indecent exposure, pawing, unwilling sexual intercourse etc.).....

- 6.4 Have you experienced any of the following:
(Cross off for each line)
- | | No | Yes, at times | Yes, often |
|---|--------------------------|--------------------------|--------------------------|
| Heavy pressure of work at school..... | ☐ | ☐ | ☐ |
| Heavy pressure from others to succeed/ to do well at school | ☐ | ☐ | ☐ |
| Find it very difficult to concentrate in class | ☐ | ☐ | ☐ |
| Find it very difficult to understand the teacher when he/she is teaching..... | ☐ | ☐ | ☐ |

- 6.5 Has a professional said that you have or have had reading or writing difficulties? (One cross only!)

Yes, major	Yes, moderate	Yes, slight	No
☐ 1	☐ 2	☐ 3	☐ 4

- 6.6 Have you, in the course of the last 12 months experienced bullying at school / on the way to school?
(One cross only!)

Never	Sometimes	About once a week	Several times a week
☐ 1	☐ 2	☐ 3	☐ 4

U7. USE OF THE HEALTH SERVICES

- 7.1 Have you yourself used any of the following services in the past 12 months :

(Cross off for each line)	Never	1-3 times	4 times or more
Schools Health Service.....	☐	☐	☐
Youth Health clinic	☐	☐	☐
Ordinary doctor (General Practitioner).....	☐	☐	☐
Educational/Psychological Service.....	☐	☐	☐
Psychologist or psychiatrist..... (private or at an outpatient clinic)	☐	☐	☐
Family counselling.....	☐	☐	☐
Other consultant (specialist) (private or at an outpatient clinic).....	☐	☐	☐
Emergency service ("doctor on call") (private or public).....	☐	☐	☐
Admission to hospital.....	☐	☐	☐
Municipal social welfare services.....	☐	☐	☐
Physiotherapist.....	☐	☐	☐
Dentist/school dentist.....	☐	☐	☐
Alternative therapist.....	☐	☐	☐

U8. EDUCATION AND PLANS FOR FURTHER EDUCATION

- 8.1 What is the highest education you have considered?
(One cross only)

University or regional college education of higher degree..... (e.g. degreed teacher, lawyer, graduate engineer, dentist, doctor, psychologist, graduate economist)	☐ 1
University or regional college education at intermediate level..... (e.g. cand.mag., teacher, social worker, nurse, policeman/ woman, engineer, journalist)	☐ 2
Upper secondary school education in general, economic and administrative subjects	☐ 3
Vocational education at upper secondary school..... (cook, hairdresser, building and construction subjects, electrician, health and social subjects etc.)	☐ 4

One year's education at upper secondary school ☐ 5

Other: ☐ 6

Have not decided ☐ 7

8.2 How much of your own money have you used in the course of the last week? kr
(Small purchases plus larger items such as Hi-Fi system etc..)

YES NO

8.3 Do you have paid work in the course of the school year? ☐ ☐

If you answered "YES":

How many hours per week do you work? ca. whole hours

How much do you earn on average
per month for this work?.....kr

8.4 What grade did you get last time in your school record book? (Write only whole grades)

Maths Norwegian written English Social studies

U9. WHERE YOU GREW UP / WHERE YOU BELONG

9.1 How long have you lived in Norway? whole yrs

9.2 How long have you lived where you live now? whole yrs

9.3 Have you moved in the course of the last 5 years? (One cross only!)

No Yes, once Yes, 2-4 times Yes, 5 times or more

☐ 1☐ 2☐ 3☐ 4

9.4 My parents are:(One cross only!)

Married/partners Unmarried Divorced/separated One or both are dead Other

☐ 1☐ 2☐ 3☐ 4☐ 5

9.5 Where were your parents born?

Norway Another country

Which country:

Father: ☐ ☐ Father: _____

Mother: ☐ ☐ Mother: _____

9.6 I think that our family, seen in relation to other families in Norway, has:

(One cross only!)

Poor economy Moderate economy Good economy Very good economy

☐ 1☐ 2☐ 3☐ 4

9.7 Do your father and / or mother have paid employment at present?

Yes, full time Yes, part time Unemployed/ disability pens. At home Attending school/ studying Dead

Father: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6

Mother: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6

If your father and/or your mother has paid employment, what is his/her occupation?

Father: _____

Describe briefly what he does at work:

Mother: _____

Describe briefly what she does at work:

U10. FAMILY AND FRIENDS

10.1 Who do you live together with at present? (One cross only!)

(Do not include brother and sisters, or half-brothers/sisters.)

Mother and father Mother only Father only About the same time with mother and father

☐ 1☐ 2☐ 3☐ 4

Mother or father and new partner or husband/wife

Foster parents

Other

☐ 5☐ 6☐ 7

10.2 How many brothers and sisters or half-brothers/sisters (siblings) do you live together with?..... Number siblings

10.3 How many of these are the same age or older than you? Number siblings

10.4 When you think about your family, would you say that:
(Cross off for each line)

Completely agree

Partly agree

Partly disagree

Completely disagree

I feel attached to my family.....

☐☐☐☐

My family takes me seriously.....

☐☐☐☐

My family values my opinions

☐☐☐☐

I mean a lot to my family.....

☐☐☐☐

I can count on my family when I need help.....

☐☐☐☐

1

2

3

4

10.5 What kind of relationship do you have with your parents?
(Cross off for each line)

Completely agree

Partly agree

Partly disagree

Completely disagree

My parents know where I am and what I am doing at weekends.....

☐☐☐☐

My parents know where I am and what I am doing during the week.....

☐☐☐☐

My parents know who I am together with in my spare time

☐☐☐☐

My parents like the friends I am together with in my spare time.....

☐☐☐☐

1

2

3

4

10.6 When you think about your friends, would you say that: (Cross off for each line)

Completely agree

Partly agree

Partly disagree

Completely disagree

I feel closely attached to my friends

☐☐☐☐

My friends value my opinions

☐☐☐☐

I can help/support my friends

☐☐☐☐

I can count on my friends when I need help

☐☐☐☐

1

2

3

4

10.7 How many persons outside your immediate family are so close to you that you can count on help if you:

Have personal problems Number of persons

Have practical problems (e.g. with school work) Number of persons

10.8 Have you yourself been exposed to violence (been hit, kicked or similar) during the last 12 months.? (One cross only!)

Never Yes, only by youth Yes, only by adults Yes, by youth and adults

☐ 1☐ 2☐ 3☐ 4

U11. SEXUAL BEHAVIOUR AND CONTRACEPTION

Yes, with one partner

Yes, with several partners

No

11.1 Have you ever had sexual intercourse?

☐☐☐

If you answered "NO", go straight to Y12

11.2 Age the first time? yrs

11.3 Did you/both of you use contraception at your last intercourse?

No

Yes, condom

Yes, p-pill/p-injection

Yes, other

Do not know

☐ 1☐ 2☐ 3☐ 4☐ 5

YES NO Do not know

11.4 Have you ever been pregnant/made a girl pregnant?

☐☐☐

If you answered "YES"

How old were you when this happened? yrs

YES NO Do not know

Did you/the girl have the pregnancy terminated ?..... ☐ ☐ ☐

U12. USE OF MEDICINES ETC.

- 12.1 How often in the course of the last 4 weeks have you taken the following medicines? (Cross off for each line)
*In this case, medicines means medicine bought at a pharmacy.
Food supplements and vitamins are not included here)*

	Never	Daily	Every week, but not every day	Less often than every week	Not taken during the last 4 weeks
Painkillers, off prescription	☐	☐	☐	☐	☐
Painkillers, on prescription	☐	☐	☐	☐	☐
Allergy-medicine.....	☐	☐	☐	☐	☐
Asthma-medicine	☐	☐	☐	☐	☐
Sleeping pills (sedatives).....	☐	☐	☐	☐	☐
Tranquillisers	☐	☐	☐	☐	☐
Anti-depressives	☐	☐	☐	☐	☐
Other medicine on prescription..	☐	☐	☐	☐	☐
	1	2	3	4	5

- 12.2 Write the name of the medicines you have crossed off above, and the reasons for taking them (illness or symptom):
(Cross of for how long you have taken the medicine)

Name of medicine: (one name on each line)	Reason for taking the medicine:	How long have you taken the medicine?	
		Up to 1 yr	One year or more
_____	_____	☐	☐
_____	_____	☐	☐
_____	_____	☐	☐

If there is not enough space above, you can continue on a separate sheet of paper and enclose this with the questionnaire.

QUESTIONS TO THE GIRLS:

YES NO

- 12.3 Have you started to menstruate? ☐ ☐

If you answered "NO", go straight to 12.5

- 12.4 How old were you when you had your first menstruation?

I was yrs

- 12.5 Do you use, or have you used:

(Cross off for each line)

	Now	Before, but not now	Never
P-pill/ mini-pill/ p-injection.....	☐	☐	☐
Other contraception.....	☐	☐	☐

What type of contraception?



Ole Rikard Haavet

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