

## Personality and Social Sciences

# Gender differences in subjective well-being, self-esteem and psychosocial functioning in adolescents with symptoms of anxiety and depression: Findings from the Nord-Trøndelag health study

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Gender differences in the prevalence of symptoms of anxiety and depression during adolescence are well documented. However, little attention has been given to differences in subjective well-being, self-esteem and psychosocial functioning between boys and girls with symptoms of anxiety and depression. The aim of this study was to investigate gender differences in the associations between such symptoms and subjective well-being, self-esteem, school functioning and social relations in adolescents. Data were taken from a major population-based Norwegian study, the Nord-Trøndelag Health study (HUNT), in which 8984 (91% of all invited) adolescents, aged 13–19 years, completed an extensive self-report questionnaire. Although prevalence rates of symptoms of anxiety and depression were higher in girls than in boys, a significant interaction between gender and symptoms of anxiety and depression was found in respect of each of the following outcome variables: subjective well-being, self-esteem, academic problems, frequency of meeting friends and the feeling of not having enough friends. These interactions indicate that the associations between symptoms of anxiety and depression and lower subjective well-being and self-esteem, more academic problems in school and lower social functioning were stronger for boys than for girls. Our findings may contribute to an earlier assessment and more efficient treatment of male adolescent anxiety and depression.

**Key words:** Mental health, depression, adolescence, subjective well-being, self-esteem, academic problems, behavior problems, social relations, Young HUNT study.

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## INTRODUCTION

The role of gender in anxiety and depression during adolescence has attracted much attention in recent years. A large body of research has dealt with the sharp increase in prevalence of female depression during adolescence, which seems to result from a combination of biological and environmental factors (Nolen-Hoeksema, 2001; Rutter, 2007; Wichstrom, 1999; Zahn-Waxler, Shirtcliff & Marceau, 2008). However, no similar body of research addresses depression in adolescent males.

While depression is known to negatively affect virtually every sphere of psychosocial functioning, the extent of impairment associated with depression in adolescents, and the daily functioning of adolescents who suffer from depression are not well documented (Jaycox, Stein, Paddock *et al.*, 2009). Knowledge about gender differences in the daily functioning of adolescents with symptoms of anxiety and depression is even more limited. It is well accepted that investigation of gender differences is an invaluable tool for understanding psychopathology (Rutter, Caspi & Moffitt, 2003), and that more research, designed to explore gender differences is needed (Zahn-Waxler *et al.*, 2008).

New contributions to this overlooked area of research may be of important clinical relevance. Knowledge of gender-specific psychosocial correlates that are associated with symptoms of anxiety

and depression may contribute to earlier assessment and more effective intervention methods, tailored to fit boys' and girls' special needs.

The current study addresses this gap in knowledge through the analysis of a large community based survey of 8984 adolescents, which enabled us to investigate correlates of anxiety and depression that are central to an adolescent's life. We chose to explore subjective well-being and self-esteem, and psychosocial correlates, namely: school functioning and social relations.

Subjective well-being and self-esteem are complementary aspects to symptoms of anxiety and depression for mental health evaluation. A decrease in self-esteem is one of the distinct symptoms of depression (American Psychiatric Association, 2000). Subjective well-being is one of the most frequently used constructs of positive psychological characteristics associated with mental health, and is closely and negatively correlated to depressive symptomatology (Nes, Roysamb, Tambs, Harris & Reichborn-Kjennerud, 2006).

While it is known that adolescents with symptoms of anxiety and depression are commonly characterized by lower psychosocial functioning, more stress and less social support than adolescents without those symptoms (Lewinsohn, Roberts, Seeley, Rohde, Gotlib & Hops, 1994; Scheier & Botvin, 1997), other research on gender differences among adolescents with symptoms

of anxiety and depression is scarce. We were not able to find research on gender differences in subjective well-being and self-esteem in adolescents with symptoms of anxiety and depression.

Some evidence suggests that lower functioning at school is correlated with symptoms of anxiety and depression in boys but not in girls (Storksen, Roysamb, Moum & Tambs, 2005; Sund, Larsson & Wichstrom, 2003). However, it is not clear why. Some researchers report greater prevalence of the co-morbidity of symptoms of anxiety and depression and externalizing symptoms in girls than boys (Zahn-Waxler *et al.*, 2008), while others report the opposite (Chen & Simons-Morton, 2009). Social isolation and lack of social support seem to be more strongly associated with symptoms of anxiety and depression in boys than girls (Larson, Richards, Raffaelli, Ham & Jewell, 1990; Troop-Gordon & Ladd, 2005). Methodological problems such as statistically controlling for gender, excluding the examination of interactions between gender and other factors, and excessive focus on girls, may have led to this scarcity of findings (Crick & Zahn-Waxler, 2003; Zahn-Waxler *et al.*, 2008).

In the present study, we attempted to explore gender-specific associations between symptoms of anxiety and depression, and subjective well-being, self-esteem and psychosocial functioning of adolescents. More specifically, we addressed the following questions:

- (1) What characterizes the subjective well-being, self-esteem and psychosocial functioning of boys and girls with and without symptoms of anxiety and depression?
- (2) Is gender a moderator variable in the associations between symptoms of anxiety and depression, and subjective well-being, self-esteem, social relations, school functioning and behavior problems at school?

## METHODS

### Participants

The Nord-Trøndelag Health Study (HUNT), conducted from 1995 to 1997, was a health survey of residents aged 13 and older of the central Norwegian county of Nord-Trøndelag. The county has approximately 127,000 inhabitants. The Young HUNT 1 comprises the adolescent part of the HUNT study.

All students in junior high school and senior high school aged 13–19 were invited to participate. Adolescents outside the school system were identified through lists obtained from the local authorities. Of the total 10,202 eligible adolescents, only 285 were not attending school. The present study included all 8704 adolescents with valid gender information and symptoms of anxiety and depression scale (SCL 5) scores; 4358 boys and 4346 girls. The mean age was 16.0 years (standard deviation,  $SD = 1.8$ ).

### Procedure

Data collection was mainly organized through the local school system. Norway has a public school system for all students, regardless of handicap or learning difficulties, and special schools are rare. Junior high school is compulsory, while students have the right to a free high school education. Overall, 8984 adolescents (91% of those approached) participated by completing a comprehensive self-administered questionnaire. A further description of the Young HUNT data material is given by Holmen (2000).

### Ethical considerations

The study was evaluated and approved by the Regional Committee for Medical and Health Research Ethics. Written consent was obtained from all participants. In addition, parents' consent was obtained for participants younger than 16. The use of encrypted identification bar codes secured the participants' anonymity.

### Measures

The full original questionnaire and its English translation can be downloaded from the HUNT website: <http://www.ntnu.edu/hunt/data/que>

*Symptoms of anxiety and depression* were measured by a shortened version of the Symptom Check List for anxiety and depression (SCL 25). The short version, SCL 5, is a widely used self-administered questionnaire (Derogatis, 1983; Strand, Dalgard, Tambs & Rognerud, 2003). It has been translated into Norwegian and validated in the local population, from the age of 16, and reached a Cronbach alpha of 0.85 (Tambs & Moum, 1993). In order to account for the same prevalence rates of anxiety and depression as the original SCL 25 questionnaire, a mean cut-off score of  $SCL\ 5 > 2$  has been suggested (Strand *et al.*, 2003). This cut-off score was applied in the present study to define the presence of symptoms of anxiety and depression. In the SCL 5, participants are asked to rate, on a four-point Likert scale, how much they have been bothered by the following thoughts and feelings during the previous 14 days: felt consistently afraid and anxious; felt tensed or uneasy; felt hopelessness when thinking about the future; felt depressed or sad; and worried too much about various things. The scale ranges from "not bothered" to "very bothered". In the present study, the SCL 5 Cronbach's alpha was 0.80 in the whole sample; 0.80 and 0.77 for the girls and boys groups, respectively.

*The subjective well-being scale* consisted of the following three questions: (1) "When you think about the way your life is going at present, would you say that you are by and large satisfied with life or are you mostly dissatisfied?", (2) "In general, do you feel strong and in a good mood or tired and worn out?" and (3) "Are you generally happy or sad?". Respondents were given seven possible answers for each question, ranging from the extreme negative (e.g. very unsatisfied) to the extreme positive (e.g. very satisfied). Higher scores indicate higher subjective well-being. The subjective well-being scale has been reported in a number of previous HUNT study publications (Moum, Naess, Sorensen, Tambs & Holmen, 1990). In the present study, it had an associated Cronbach's alpha of 0.74 in total; 0.74 among the boys and 0.75 among the girls. Higher values indicate better subjective well-being.

*Self-esteem* was measured by a short version of the Rosenberg Self-Esteem Scale (Rosenberg, 1965), consisting of four statements; for example: "I feel I do not have much to be proud of". Respondents answered in terms of a four-point scale ranging from "I totally agree" (1) to "I totally disagree" (4). A high degree of correlation (0.95) has been reported between the four-item version and the original scale, in a validation study with Norwegian adolescents (Ystgaard, 1993). In the present study, a Cronbach's alpha of 0.74 was obtained for the four-item scale in the whole sample. In the boys subgroup Cronbach's alpha reached 0.69 and in the girls 0.75. High scores correspond to high self-esteem.

### Psychosocial functioning variables

*Academic problems and behavior problems at school* were measured as part of school-related questions designed by the Norwegian Institute of Public Health. Participants were asked to consider 14 statements about school, and to respond according to a four-point scale ranging from "never" (1) to "very often" (4). In a previous study using the HUNT data, these 14 statements were subjected to factor analysis (Storksen, Roysamb, Holmen & Tambs, 2006). The present study used two of these factors: "Academic problems" (highest loading item: "I have problems concentrating in class") and "Behavior problems in school" (highest loading item: "I am reprimanded by my teacher"). Cronbach's alphas, based on standardized items for these

factors, were 0.67 for the academic problems scale, both for the whole sample and in the boys and girls subsamples separately. For the Behavior problems in school scale it was 0.65 for the whole sample, and 0.67 and 0.64 for boys and girls, respectively. High scores indicate more problems than low scores.

The *social relations* of the respondents were examined by two questions: (1) "Do you feel you have enough friends?" (yes/no) and (2) "How frequently do you meet your friends?" This variable was calculated by taking the mean frequency of paying and receiving visits in the last week. Possible answers ranged from never (1) to four or more times (4). These questions were specifically designed for the HUNT study, by the Norwegian Institute for Public Health. The questions do not comprise a scale, so the associated data were analyzed separately.

*Socio-economic status (SES)* was measured by the variables of parents' education and income, which were obtained from Statistics Norway for each participant. Parents' education level was divided into six ascending categories according to the length and type of education, ranging from "up to four years of elementary school" (0) to "Master's degree or above" (6). The composite variable was the mean score of both parents' education. The correlation between educational level and income was 0.49. Educational level contributed more to the explained variance, and thus was chosen as an indicator of SES.

### Statistical analyses

Changes of prevalence in respect of gender and age were checked using separate logistic regression analyses for each gender. The dependent variable in logistic regression was presence of anxiety and depression symptoms (1) versus absence of such symptoms (0), with age as the independent variable.

Due to a large number of participants, the significance level for all the analyses was set on  $p < 0.01$ .

We compared mean scores of SCL 5 of boys and girls who reported symptoms of anxiety and depression, and mean scores of those who reported no symptoms, for an exploratory analysis of gender differences. The data were examined with *t*-tests and chi-square tests.

We used multiple linear regression analyses in order to investigate whether the impact of the SCL 5 score was dependent on gender. This was done by performing five regression analyses. The independent variables were SCL 5 score as a continuous variable, age, gender and the interaction between gender and SCL 5 score. The respective dependent variables were subjective well-being, self-esteem, academic problems at school, behavior problems at school and spending time with friends. These analyses were controlled for possible confounders such as age and parents' educational level. Associations between the independent and outcome variables were expressed in unstandardized Bs, standardized betas and  $R^2$ .

In these full regression models, the SCL 5 score was centered (the mean score was subtracted from each original score) to avoid possible multi-collinearity problems (Aiken & West, 1991). Tolerance values that indicated no multi-collinearity were found in the various models (Field, 2005), and the correlations between the independent variables and the respectively dependent variables were between low to moderate (0.6). The numbers of participants entered into the analyses varied slightly due to non-responses on some items (< 1% for all analyses).

Last, the impact of symptoms of anxiety and depression for each gender was analyzed by performing the same regression analyses for each gender separately.

Similarly, we checked whether the impact of the SCL 5 score on "the feeling of not having enough friends" was dependent on gender by performing a full regression analysis that also included gender and the interaction between gender and SCL 5 score, and was controlled for age and parents' educational level. Later, we performed gender-specific logistic regression analyses using "the feeling of not having enough friends" as the dichotomous dependent variable, and SCL 5 score, age and parents' education as continuous independent variables. The associations were expressed by unstandardized Bs and odds ratios with 95% confidence intervals.

All data analyses were carried out using the Statistical Package for Social Sciences for Windows, version 16 (SPSS Inc, Chicago, IL).

## RESULTS

### Sample descriptives

In both genders, adolescents presenting symptoms of anxiety and depression were a little older overall than adolescents without those symptoms (mean age = 16.6,  $SD = 1.8$ , vs. mean age = 16.0,  $SD = 1.8$ ,  $p < 0.01$ ). No age differences between boys and girls who presented symptoms of anxiety and depression or between boys and girls without such symptoms were found. Nor did we find any differences in parents' educational level between groups (data not shown).

Overall, 10.2% (903/8842) of the participants presented symptoms of anxiety and depression. The prevalence of these symptoms was strongly dependent on gender: 14.7% (647/3767) of the girls reported symptoms of anxiety and depression vs. 5.8% (256/4172) of the boys,  $p < 0.001$ .

Prevalence of anxiety and depression symptoms increased with age for both genders. For boys, the odds ratio (OR) increased by 1.23 (95% confidence interval (CI): 1.14–1.32,  $p < 0.001$ ) for each additional year in age. For girls, the corresponding number was 1.20 (95% CI: 1.15–1.26,  $p < 0.001$ ).

### Characteristics of boys and girls with and without symptoms of anxiety and depression

We explored differences between boys and girls who presented symptoms of anxiety and depression, and those without such symptoms (Table 1). All the findings from Table 1, which are detailed below, are significant at the 0.01 level.

Boys without symptoms of anxiety and depression had a higher subjective well-being than girls without symptoms. No gender differences in subjective well-being were found among those who presented symptoms. Boys' self-esteem was higher than girls', both among those who presented symptoms and those who did not. Adolescents without symptoms had academic problems at the same rate regardless of their gender, but boys with symptoms presented more problems than girls with symptoms. Boys had more behavior problems at school than girls in both conditions, and boys without symptoms spent more time with friends than girls without symptoms, while no gender differences were found among adolescents with symptoms. In addition, boys felt at the same frequency as girls that they did not have enough friends, 14.0% of the boys without symptoms vs. 12.4% of the girls, among those with symptoms, 36.8% vs. 30.8%, respectively. (These results are not presented in the table).

### Gender as a moderator in the associations between symptoms of anxiety and depression and subjective well-being, self-esteem and psychosocial functioning

Gender differences were investigated by five linear regression analyses (Table 2) and one logistic regression analysis (Table 3). A significant interaction between gender and SCL 5 score was

Table 1. Mean scores of the measured variables by gender and presence of anxiety and depression symptoms

Variable	Presence of symptoms	Mean (SD)		<i>t</i> (df=1)
		Girls	Boys	
Subjective well-being	No	5.31 (0.80) **	5.49 (0.85)	9.41
	Yes	4.23 (0.90)	4.20 (1.06)	0.63
Self-esteem	No	2.95 (0.48) **	3.21 (0.47)	12.92
	Yes	2.43 (0.59) **	2.68 (0.63)	5.35
Academic problems at school	No	1.88 (0.38)	1.88 (0.47)	0.45
	Yes	2.29 (0.39)**	2.40 (0.50)	3.06
Behaviour problems at school	No	1.39 (0.35) **	1.50 (0.45)	23.97
	Yes	1.55 (0.45)**	1.75 (0.57)	4.93
Spending time with friends	No	2.83 (0.73) **	2.89 (0.77)	3.36
	Yes	2.76 (0.78)	2.75 (0.80)	0.10

Note: Mean scores comparisons between boys and girls with symptoms of anxiety and depression or between boys and girls without such symptoms were performed by independent sample *t*-tests.

\*\*  $p < 0.01$ .

Table 2. Multiple linear regression analyses for each of the measured variables, performed for each gender separately

Variable	N	Constant	B (SE)			Beta			$R^2$
			SCL score	Age	Parents' educational level	SCL score	Age	Parents' educational level	
Subjective well-being	Girls 4058	7.05 (0.11)***	-0.89 (0.03)***	-0.03 (0.01)***	-0.01 (0.01)	-0.47	-0.06	-0.01	0.23
	Boys 4376	7.50 (0.11)***	-1.05 (0.03)***	-0.04 (0.01)***	0.013 (0.01)	-0.49	-0.09	0.02	0.26
Self-esteem	Girls 4031	3.04 (0.07)***	-0.41 (0.02)***	0.03 (0.00)***	0.01 (0.01)	-0.36	0.10	0.01	0.13
	Boys 4356	3.40 (0.07)***	-0.47 (0.02)***	0.02 (0.00)***	0.01 (0.01)	-0.40	0.09	0.03	0.16
Academic problems	Girls 4038	0.83 (0.06)***	0.32 (0.01)***	0.04 (0.00)***	-0.00 (0.01)	0.35	0.17	-0.01	0.16
	Boys 4340	0.66 (0.06)***	0.37 (0.02)***	0.05 (0.00)***	-0.01 (0.01)	0.35	0.19	-0.01	0.18
Behavior problems	Girls 4032	1.44 (0.05)***	0.17 (0.01)***	-0.02 (0.00)***	0.00 (0.01)	0.21	-0.09	0.01	0.05
	Boys 4335	1.77 (0.06)***	0.18 (0.02)***	-0.03 (0.00)***	-0.00 (0.01)	0.17	-0.12	-0.01	0.04
Frequency of meeting friends	Girls 4040	3.03 (0.11)***	-0.02 (0.03)	-0.01 (0.01)	0.00 (0.01)	-0.01	-0.03	0.01	0.001
	Boys 4358	2.83 (0.11)***	-0.18 (0.03)***	0.02 (0.01)**	0.00 (0.01)	-0.1	0.04	-0.00	0.01

Note: Unstandardized coefficients (B) and their corresponding standard errors, and standardized coefficients (Beta) in the various linear regression equations are shown.

\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

Table 3. Gender-specific logistic regression with the "Feeling of not having enough friends" as the dependent variable

Variable	N	Constant	B (SE)			OR (95% CI)		
			SCL score	Age	Parents' educational level	SCL score	Age	Parents' educational level
Feeling of not having enough friends	Girls 4040	3.03 (0.11)***	-0.02 (0.03)	-0.01 (0.01)	0.00 (0.01)	1.12 (0.90-1.39)	1.14 (1.08-1.20)	1.04 (0.96-1.13)
	Boys 4358	2.83 (0.11)***	-0.18 (0.03)***	0.02 (0.01)**	0.00 (0.01)	3.08 (2.60-3.65)	1.10 (1.05-1.15)	1.03 (0.96-1.11)

Note: Unstandardized coefficients (B) and their corresponding standard errors, and odds ratios are shown.

\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

found in respect of each of the following outcome variables: subjective well-being ( $p < 0.001$ ), self-esteem ( $p = 0.005$ ), academic problems ( $p = 0.003$ ), frequency of meeting friends ( $p < 0.001$ )

and the feeling of not having enough friends ( $p < 0.001$ ). The impact of having symptoms of anxiety and depression for each gender on the various outcome variables can be seen in the linear

regression analyses performed for each gender separately. Unstandardized B coefficients for SCL5 scores presented in Table 2 represent the magnitude of change in SCL 5 score, which corresponds to a one-point increase in an outcome variable score. B values are in all cases higher for boys than for girls, and the difference is significant in all cases in which the interaction effect between gender and SCL 5 score was significant. These B values together with the significant interaction effect indicate that the negative influence of having symptoms of anxiety and depression was larger among boys than among girls in subjective well-being, self-esteem, academic problems and frequency of meeting friends.

In addition, the gender-specific logistic regression analysis with "feeling of not having enough friends" as an outcome variable revealed a clear gender difference: Elevated SCL 5 scores were associated with higher risk for feeling of not having enough friends among boys, but not among girls (Table 3).

## DISCUSSION

The aim of this study was to investigate gender differences in subjective well-being, self-esteem and psychosocial functioning of boys and girls with and without symptoms of anxiety and depression.

In the current study, adolescents with and without symptoms of anxiety and depression presented the same pattern of gender differences in self-esteem, behavior problems and in the frequency of feeling that they had enough friends. However, in other variables, the pattern of gender differences varied between those who presented symptoms of anxiety and depression and those who did not. The main finding of the current study is that gender was a moderator in the well-being and functioning of adolescents with symptoms of anxiety and depression; the associations between such symptoms and lower subjective well-being, self-esteem, higher academic problems and lower psychosocial functioning were larger among boys than among girls.

Some of these findings are in line with previous research. The prevalence of symptoms of anxiety and depression found in our study is similar to the prevalence which has been reported by many international and Scandinavian studies (Bilenberg, Petersen, Hoerder & Gillberg, 2005; Costello, Egger & Angold, 2005; Meltzer, Gatward, Goodman & Ford, 1999). A previous Norwegian study reported a similar prevalence increase with age (Wichstrom, 1999). The questionnaire we used, the SCL 5, has been validated on Norwegian youth only from the age of 16. However, the compatibility between our findings and previous research accounts for the validity of this tool also for participants aged 13–15.

It is noteworthy to mention that we assessed symptoms of anxiety and depression using a self-report questionnaire, which does not allow for a clinical diagnosis. However, self-report instruments demonstrate satisfactory levels of sensitivity and specificity in the identification of depression. A high degree of overlap between the phenomenology and measurement of symptoms of anxiety and depression and depression has been reported (Jenkins & Curwen, 2008). The fact that the prevalence found in our study is similar to that of previous studies serves to strengthen the validity of our measurement tool. Additionally, stronger associations between symptoms of anxiety and depression and lower function-

ing in boys than in girls are in line with some evidence from previous research regarding social relations (Larson *et al.*, 1990; Troop-Gordon & Ladd, 2005) and school functioning (Storksen *et al.*, 2005; Sund *et al.*, 2003).

However, we were not able to find any previous work that has accounted for multiple domains of lower functioning in boys than in girls with such symptoms. Few studies have focused on psychosocial functioning in adolescents with symptoms of anxiety and depression (Lewinsohn *et al.*, 1994; Scheier & Botvin, 1997; Takakura & Sakihara, 2001). By contrast with previous research, we were mainly interested in the daily functioning of adolescents who presented such symptoms. Therefore, we used symptoms of anxiety and depression as a predictor variable and functioning as the outcome variable. Following Crick and Zahn-Waxler's (2003) recommendations, we also included an interaction effect between gender and symptoms of anxiety and depression.

A possible explanation of our findings may be related to previous research, which has found that girls, on the whole, seem to demonstrate greater social sensitivity and emotional regulation than boys from birth, and that these differences appear to persist across the life span (Zahn-Waxler *et al.*, 2008). Both fathers and mothers seem to vary their socialization behavior according to their child's gender; thus, for example, they may encourage their daughters to express sadness or fear, while discourage their sons from doing the same (Chaplin, Cole & Zahn-Waxler, 2005; Fivush, Brotman, Buckner & Goodman, 2000; Hastings & De, 2008). When stressed, girls use more emotional coping strategies and rumination, while boys tend to adopt distraction and aggressive strategies (Storksen *et al.*, 2005; Zahn-Waxler *et al.*, 2008). Rumination and co-rumination with friends, which seem to be more frequent among girls, were considered risk factors for depression (Zahn-Waxler *et al.*, 2008). However, ruminators appear to have higher-quality friendships than non-ruminators (Chaplin *et al.*, 2005; Zahn-Waxler *et al.*, 2008). Therefore, one should differentiate between risk factors for depression and coping strategies while depressed. Although rumination and co-rumination may increase the risk for depression, they may also increase possibilities for support in distress, and help girls to function better, despite their problems. It might be that boys tend to lose their social support earlier than girls when distressed, and hence enter a vicious cycle that affects their self-esteem, subjective well-being and functioning at school.

Some support for the idea that boys are at greater risk of losing social support when distressed can be found, as mentioned above, in previous research (Larson *et al.*, 1990). Moreover, a continuous lack of support was suggested as a pathway for depression in adolescent males (Capaldi & Stoolmiller, 1999).

The use of self-report questionnaires in the Young HUNT study allowed for the investigation of a broad spectrum of phenomena in a large sample. However, it should be acknowledged that all such data might be more prone to bias due to the possible influence of social desirability factors. Some of the measurement tools are shortened versions of widely used questionnaires. Although these versions demonstrate good validity, as with all such instruments, they may involve some reduction in sensitivity. The cross-sectional design of the study does not enable to infer causality, and the validity of its findings may be a bit limited since there are no big cities in Nord-Trøndelag County.

This paper is based on data which has been collected between the years 1995 and 1997. However, we compared the prevalence of symptoms of anxiety and depression in the current study with prevalence in later phases of this study (2000, 2006; unpublished data) and found very similar rates.

Finally, it may be observed that the impact of gender on some of the outcome variables was small. The use of a population-based sample, together with a screening instrument may have reduced this magnitude. However, the existence of a consistent pattern in most of the associated domains supports our interpretation.

The current study is one of very few works which have investigated gender differences in functioning. Future longitudinal research is needed to broaden our understanding of the underlying mechanisms which lead to these differences. It will be interesting to check whether the growing social activity of adolescents via the internet has changed this picture.

## CONCLUSION

The main finding of this study is that the associations between symptoms of anxiety and depression and lower subjective well-being, self-esteem, social relations and school problems were larger in boys than in girls. As far as we know, this is the first study to report significant gender differences in psychosocial functioning of adolescents who present symptoms of anxiety and depression, and to highlight the unique difficulties that adolescent boys experience. We used a representative database of 8984 adolescents, which can form a good basis for generalizing our results.

Fewer boys than girls present symptoms of anxiety and depression. Boys who do not present externalizing symptoms are easy to overlook. Our findings draw attention to the unique features of male anxiety and depression, and may contribute to earlier assessment and more effective treatment methods.

We dedicate this paper to the beloved memory of Professor Matthew Colton, who died unexpectedly while this paper was in its final preparation phase. The Nord-Trøndelag Health Study (HUNT) is a product of the collaboration between the HUNT Research Centre, the Faculty of Medicine at the Norwegian University of Science and Technology (NTNU, Verdal), the Norwegian Institute of Public Health and the Nord-Trøndelag County Council. This study was financed by a PhD grant awarded to the first author by the Norwegian Foundation for Health and Rehabilitation through the National Council for Mental Health, and by funds provided by the Regional Centre for Child and Adolescent Mental Health (RBUP) at the Department of Neuroscience, Faculty of Medicine, Norwegian University of Science and Technology, Trondheim, Norway. Gunnar Taraldsen is now at SINTEF ICT, Trondheim, Norway.

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