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ORIGINAL ARTICLE

The association between disability, school achievement expectations, self-efficacy and psychosomatic problems among Swedish adolescents attending compulsory regular school

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Abstract

The purpose was to investigate the association between disability, and psychosomatic problems among adolescents at compulsory regular school also taking into account parental and student achievement expectations and student self-efficacy. We analysed cross-sectional questionnaire data collected in 2010, from 2004 Swedish adolescents. The results showed that the degree of psychosomatic problems and self-efficacy varied with regard to whether the adolescent reported having a disability or not. The distribution of parents' and adolescents' own achievement expectations did not differ significantly with regard to having a disability. Neither achievement expectations nor self-efficacy did moderate the association between disability and psychosomatic problems.

KEYWORDS
achievement expectations, adolescents, disability, psychosomatic problems, self-efficacy

INTRODUCTION

School is the educational *and* primary care sector supporting adolescents with a disability such as emotional disturbance, an intellectual disability, a learning disability or some other health impairment (Sullivan et al., 2018). Compared to adolescents without a disability, adolescents with a disability or chronic condition are at higher risk for school failure (Takeda & Lamichhane, 2018), concurrent and future social, health and mental health problems (Abebe et al., 2019; Brunnberg et al., 2008; Fremont, 2019; Persson et al., 2013). Compared to adolescents without a disability, adolescents with a disability or medical condition have higher absence from school due to their condition (Finning et al., 2022; Lum et al., 2019b; Olsson et al., 2013), and they are more likely to repeat a grade (Lum et al., 2019b) and have also lower satisfaction with school according to recent studies (Arciuli & Emerson, 2020; Lum et al., 2019a). School completion is a crucial protective factor against future social problems and difficulties (Vinnerljung et al., 2010). It may be particularly so for adolescents with a disability or a medical condition. Hence, early preventive measures and health promotion are strongly justified.

Having a disability may be related to or affected by other factors, and the strength of the association between having a disability and mental health problems might also be affected by such factors, for example by parental and adolescent achievement expectations, but also by a personal resource like self-efficacy. In the following sections, these factors are presented.

Students' own achievement expectations

Several studies have examined actual academic achievement, that is marks and scores on academic tests, among adolescents with a disability or chronic condition (Holopainen & Hakkarainen, 2019; Minkkinen et al., 2017). Compared to adolescents without ADHD, research showed that adolescents with ADHD had lower academic achievements (Kandemir et al., 2014; Owens & Jackson, 2017; Voltas et al., 2014). Research also provides evidence for poor academic achievements among adolescents with epilepsy (Kaczmarek et al., 2016), asthma (Kohen, 2010), and adolescents with diabetes (Persson et al., 2013). Nevertheless, research showed that adolescents with a chronic medical condition did not report lower academic aspirations than their healthy peers (Wisk & Weitzman, 2017). In contrast, regarding academic expectations, what they believe to be achievable, adolescents with a chronic condition reported lower expectations for their educational attainment compared to healthy adolescents (Wisk & Weitzman, 2017). Furthermore, the same study showed that the actual educational attainment was lower for young people with chronic conditions. The study included a broad range of conditions for example asthma, ADHD, diabetes, learning disability, hearing impairment and epilepsy.

Adolescents own academic achievement expectations have also been studied as a school-related stressor, that is expectations as something demanding. These studies included adolescents from general populations and did not specifically focus on adolescents with a disability or chronic condition, and addressed adolescents' optimism (Huan et al., 2006), suicidal ideation (Ang & Huan, 2006), and personal concerns (i.e., concerns about one's own emotional adjustment and self) (Huan et al., 2008). One study showed a significant and negative association between adolescent's optimism and academic expectations (Huan et al., 2006). In addition, the results did not show any gender differences when predicting academic expectations. Another study showed that adolescent depression partially mediated the relationship between academic stress—in terms of expectations from oneself and others—and suicidal ideation (Ang & Huan, 2006). Results from

another study showed that personal concerns were positively associated with the academic stress arising from one's own expectations and those of others, in both adolescent boys and adolescent girls (Huan et al., 2008). Furthermore, for girls, school-related concerns were also predictive of academic stress arising from others' expectations. Compared to boys, girls were found to have significantly greater academic stress arising from self-expectations.

Parental expectations of student achievement

Research has shown that parents' expectations of achievement play an important role for young people with a disability or a chronic condition. An Irish study using longitudinal data showed that parents' expectations of their children's academic performance were significant in relation to children's and adolescents' social and academic outcomes (McCoy et al., 2016). The disabilities included in the study were general learning/intellectual disability, specific learning disability, emotional/behavioural disability, physical disability (including visual, hearing or speech impairment) and other chronic illnesses. The results showed that parental expectations were important in shaping academic skills at the age of 13 and changes in academic skills. In particular, young people with general learning/intellectual, emotional/behavioural and specific learning disabilities performed less well academically, partly as a result of lower parental expectations. Furthermore, research adopting a longitudinal design showed that parental expectations predicted academic attainment among young people with a disability (Doren et al., 2012). In addition, the same study showed that disability type moderated the association between parental expectations and academic attainment. Parental expectations predicted high school graduation with a high school diploma among adolescents with learning disabilities but not among adolescents with intellectual disabilities. Furthermore, research showed that mothers' high achievement expectations were a source of distress among dyslexic adolescents (Rapus-Pavel et al., 2018). All but one of these studies used parent-reports of parental academic expectations.

To have high achievements expectations for students' learning and academic performance is often described as key factor for student achievement in general, and parental high expectations are no less important for youth with disabilities (Newman, 2005). However, there need to be an appropriate balance between high expectations and a realistic assessment of ability, in the light of the adolescent's disability, which may be challenging for these parents (Newman, 2005).

Self-efficacy

The concept of self-efficacy is defined as people's belief in their ability to perform the behaviours required to produce a desired outcome (Bandura, 1977). According to social cognitive theory, self-efficacy is the central mechanism of human self-regulation because it affects how much effort individuals will invest in a certain activity, how persistent they will be in confronting obstacles, and how resistant they will be to unfavourable influences (Bandura, 1993, 1997; Schunk, 1991). A study regarding self-efficacy beliefs for self-regulated learning among adolescent boys and girls with and without ADHD revealed that girls with ADHD reported the lowest levels of self-efficacy and lower confidence in their ability for self-regulatory learning compared to girls without disabilities and compared to boys (Major et al., 2013). By contrast, boys with ADHD reported similar levels of self-efficacy beliefs to adolescents without ADHD (Major et al., 2013). A Serbian study among 14-year-olds investigated the roles of self-control, self-efficacy, metacognition and

motivation in predicting school achievement (Džinović et al., 2018). The results showed that the effect of self-control on achievement was mediated by self-efficacy. Furthermore, research indicated that older youths (mean age 25.1) with a learning disability scored lower than youths without a learning disability on academic self-efficacy and higher on academic procrastination (Hen & Goroshit, 2014). Hence, research provides evidence of lower academic self-efficacy among girls with ADHD and young people with a learning disability, and that academic self-efficacy mediated the associations between self-control and academic achievement.

The theory originally stated that self-efficacy is situation specific (Bandura, 1977), meaning that a person can experience high self-efficacy in one situation and low in another. However, other researchers have proposed that self-efficacy can be generalized (Eden, 1988; Schwarzer & Jerusalem, 1995; Sherer et al., 1982). Results from a Norwegian study including older adolescents (15- to 21-year-olds) revealed that stress due to teacher interaction, peer pressure, home life, school attendance, school–leisure conflict and school performance were all negatively associated with life satisfaction, whereas general self-efficacy associated positively and strongly with life satisfaction (Moksnes et al., 2019). In addition, general self-efficacy moderated the association between both interpersonal and school-related stressors and life satisfaction. On the contrary, a Swedish study did not find that adolescents' general self-efficacy moderated the relationship between school- and family-related stressors and psychosomatic problems (Lönnfjord & Hagquist, 2021). However, the results showed that general self-efficacy was directly associated with adolescents' psychosomatic problems.

Mental and psychosocial health problems

There is evidence that having a disability or chronic condition is associated with mental health problems both in studies using cross-sectional data (Brunnberg et al., 2008; Finning et al., 2022; Fried et al., 2018; Law et al., 2009), and in a longitudinal study (Brady et al., 2021). A meta-analysis showed that young people with chronic condition have higher levels of internalizing and externalizing symptoms compared to their healthy peers (Pinquart & Shen, 2011b). A Dutch study found an association between hearing impairment and mental health problems among children and adolescents (11–18 years of age) (Van Eldik, 2005). Compared to the normative sample, children and adolescents with auditory problems reported a two to three times higher prevalence rate regarding internalizing, externalizing and severe overall mental health problems (i.e., with-drawn, somatic complaints, anxious/depressed, social problems, thought problems, attention problems, delinquent behaviour and aggressive behaviour). About 25% of the hearing-impaired sample attended mainstream schools. A Swedish study conducted among 15- and 16-year-olds investigated the associations between different disabilities and medical conditions such as visual and hearing impairments, speech defects, diabetes mellitus, mental suffering, epilepsy, stomach problems, asthma, allergic rhinitis, eczema, physical disability, overweight, ADHD/Tourette, other chronic illness, diabetes and epilepsy. The results showed that among Swedish adolescents, 43% of the girls and 35% of the boys reported at least one medical condition (Olsson et al., 2013). Furthermore, research showed that adolescents with a disability or chronic condition reported higher rates of emotional difficulties self-harm, and more symptoms of anxiety and depression compared to healthy peers (Emerson et al., 2019; King et al., 2019; Pinquart & Shen, 2011a). In addition, a meta-analysis found that posttraumatic stress symptoms were more common among young people with a chronic condition compared to control groups with peers without a chronic condition.

Research has also investigated specific disabilities or chronic conditions and its associations to different mental health problems (Frasquilho et al., 2017; Kang et al., 2019; Khanna et al., 2019; Quilter et al., 2019) and psychosocial problems (Matteucci et al., 2019) among adolescents. Furthermore, a Turkish study among 7- to 16-year-olds diagnosed with ADHD and a gender matched control group investigated the psychosocial distress associated with the disorder (Kandemir et al., 2014). The results showed that, compared to the control group, youth with ADHD scored lower on psychosocial health and showed significant differences in problem solving, communication, roles, affective responsiveness and affective involvement. In addition, research showed that, compared with adolescents without ADHD symptoms, 15- to 16-year-old Finnish adolescents with ADHD symptoms considered their psychosocial well-being to be poorer (Taanila et al., 2009). A Canadian study investigated the association between different aspects of school-related stress and depression in adolescents with and without learning disabilities (Feurer & Andrews, 2009). The results showed that, compared to non-learning disability peers, adolescents with learning disabilities reported significantly higher levels of academic self-concept stress, that is students' perceptions of their own academic abilities and performance.

In conclusion, research provides evidence that having a disability and/or a chronic condition is clearly related to academic achievement expectations (McCoy et al., 2016; Wisk & Weitzman, 2017) and self-efficacy (Hen & Goroshit, 2014; Major et al., 2013) as well as mental health problems (Brady et al., 2021; Brunnberg et al., 2008; Finning et al., 2022; Law et al., 2009; Olsson et al., 2013) among adolescents. Research showed that among 15–64 year olds with a disability, lower degree of self-efficacy correlates to poorer mental health (Moon & Kim, 2021). However, to our knowledge, the associations between self-efficacy and mental health problems have not been investigated among adolescents with a disability or chronic condition. In addition, how all these variables taken together relate to each other and to mental health problems is demonstrated to a less extent in empirical studies.

The purpose of this study was to investigate the association between disability and psychosomatic problems among adolescents at compulsory regular school, also taking into account parental and student achievement expectations, as well as student self-efficacy, including potential interaction effects.

The research questions addressed in the study are:

Does the prevalence of psychosomatic problems, parental and adolescent achievement expectations, and self-efficacy differ between adolescents with a disability and those without a disability?

How do disability, parental and adolescent achievement expectations, and adolescent self-efficacy associate with self-reported psychosomatic problems?

Do parental achievement expectations, adolescent achievement expectations or adolescent self-efficacy moderate the associations between having a disability and psychosomatic problems?

METHODS

Material

Data were collected as part of a collaboration project between Karlstad municipality and the Centre for Research on Child and Adolescent Mental Health (CFBUPH) at Karlstad University, which was funded by the Swedish Public Health Institute. Data were collected on social relationships, classroom climate, bullying and mental health. The overall aim of the project was to promote good mental health among children and adolescents.

Data collection

The data used in this study were collected in 2010 using a questionnaire among students aged between 13 and 15 (Swedish school years 7–9). Data were collected from all municipal schools in the municipality of Karlstad, Sweden. All but one participating school used a web-based questionnaire, and the remaining school used a paper-and- pencil questionnaire. A research team from CFBUPH carried out the data collection. All students received written and oral information about the aim of the study, stating that their participation was voluntary and that they had the right to withdraw their participation at any time. For children under the age of 15, written information was also given to the parents/legal guardians, and those who did not want their child to participate were asked to notify the class teacher. Table 1 shows the number of participants and non-participants.

Rasch analysis of the measurements

In preparation for the main analysis relating to the purpose of the study, the psychometric properties of the measures of psychosomatic problems and self-efficacy were analysed using Rasch measurement theory (Andrich, 1988; Rasch, 1960/1980). Rasch measurement theory can be used to evaluate existing scales or to develop new scales (Andrich, 2011). Scales, sometimes called instruments or measures, consist of multiple items intended to measure a persons' traits, attributes or constructs—something that a person can have more or less of (e.g., emotional intelligence, psychosomatic problems, sense of coherence, mathematical ability or health literacy). Rasch analysis is well suited for analyses of frequency or Likert scale questions. Rasch analysis can be used to examine whether responses to individual items can be combined into a unidimensional

TABLE 1 Participants and non-participants

	Number of pupils	Number of completed questionnaires	Non-participants *n* (%)
Entire sample			
Total	2220	2004	216 (9.7)
Boys	1083	953	132 (12.2)
Girls	1136	1046	95 (8.4)
School year[a] 7			
Total	707	656	51 (7.2)
Boys	348	322	26 (7.5)
Girls	359	331	28 (7.8)
School year 8			
Total	711	636	75 (10.5)
Boys	349	304	45 (12.9)
Girls	362	328	34 (9.4)
School year 9			
Total	802	712	90 (11.2)
Boys	386	325	61 (15.8)
Girls	416	382	34 (8.2)

[a]Swedish school year 7 starts at 13 years, year 8 at 14 years and year 9 at 15 years.

composite measure, enabling distinguishing individuals at the high and low levels of the latent trait (Andrich, 1988)—for example, distinguishing between an adolescent with a lower degree of psychosomatic problems and an adolescent with a higher degree of psychosomatic problems.

Applying Rasch measurement theory is a check whether the data meet a priori specified requirements of measurement; in other words, two different ways to consider the data–model relationship (Andrich, 2011). Thus, the Rasch analysis is used to check the extent to which the data conform to the model. One requirement according to Rasch measurement theory is invariant comparisons across sample groups: the scale or instrument should work the same way for females and males, young people and adults, across years and between cultures (Andrich, 1988; Hagquist et al., 2009). A central requirement of Rasch measurement theory is that an instrument should not be affected of whom we measure.

The Rasch model enables independent and separate estimations of item and person parameters, which is a requirement for invariant measurement. This means that the person parameters do not depend on which items are used in the estimation. Given that the data fit the Rasch model, linear person measures are provided that do not depend on the distribution of the persons in the sample. These person measures are nonlinearly transformed raw scores (logit values) (Andrich, 1988).

Measures and variable construction

Psychosomatic problems

The outcome measure used was the Psychosomatic Problems Scale, which has been shown to be a reliable and valid scale for measuring psychosomatic problems among adolescents (Hagquist, 2008). It is an eight-item scale which consists of the following items: *Had difficulty in concentrating; Had difficulty sleeping; Suffered from headaches; Suffered from stomach aches; Felt tense; Had little appetite; Felt sad; Felt giddy*. All of these items are in the form of questions, with the response options 'Never', 'Seldom', 'Sometimes', 'Often' and 'Always', coded 1 to 5. A higher score implies more psychosomatic problems. This scale was evaluated using Rasch measurement theory. Because the Psychosomatic Problems scale showed good psychometric properties, the person estimates generated by the Rasch analysis were used in the statistical analyses. The logit values ranged from −4.87 to 4.52. In order to compare distinct groups of adolescents according to their degree of psychosomatic problems, that is comparing adolescents at both ends of the continuum, the variable was trichotomized, based on the percentile values. Adolescents as close to and over the 75th percentile constituted the category *Higher degree of psychosomatic problems*, adolescents above the 25th but below the 75th percentile constitute the category *Moderate degree of psychosomatic problems*, and adolescents as close to and below the 25th percentile constituted the category *Lower degree of psychosomatic problems*.

Disability

In order to capture adolescents' disabilities, a single yes-or-no question was used, followed by a definition. The definition used in the present study was a slightly modified version of the definition used in the Swedish version of the Health Behaviour in School-aged Children (HBSC) survey: *Do you have a disability?*

> 'By *disabilities* we mean that you have, for example, impaired movement, dyslexia, a vision or hearing impairment or any other impairment that makes things difficult for you either at or outside of school. It may also mean that you have ADHD, epilepsy or diabetes'.

Parents' and students' achievement expectations

Two questions were used to measure achievement expectations: *Do your parents place high demands on you to achieve good results/grades at school?* and *Do you place high demands on yourself when it comes to results/grades at school?* with the response options 'Never', 'Seldom', 'Sometimes', 'Often' and 'Always'. Hence, in this study parental achievement expectations were measured from the adolescents' perspective. The variables were dichotomized, with 'Never', 'Seldom' and 'Sometimes' labelled as *Low achievement expectations* and 'Often' and 'Always' labelled as *High achievement expectations*. The recoding procedure was carried out in order to avoid empty cells in the regression analysis.

Self-efficacy

The Swedish version of the General Self-Efficacy (GSE) scale (Koskinen-Hagman et al., 1999; Schwarzer & Jerusalem, 1995) was used to measure self-efficacy. This consists of ten items (e.g., *It is easy for me to stick to my aims and accomplish my goals*, *I can solve most problems if I invest the necessary effort*) with four response options (from 'Not at all true' to 'Exactly true'). The responses to the items are summated across respondents, yielding a total score between 10 and 40; higher scores indicate higher self-efficacy. The Swedish version of the GSE scale has previously been psychometrically evaluated using Rasch Measurement Theory based on adolescent data (Lönnfjord & Hagquist, 2017). In that analysis, item 6 (*I can remain calm when facing difficulties because I can rely on my coping abilities*) showed evidence of differential item functioning (DIF) (Hagquist & Andrich, 2017) across sexes. Given the same location on the variable, boys scored higher than girls on that item. In order to resolve this DIF, item 6 was split into two sex-specific items, one for boys and one for girls. Hence, in the final scale, nine items were intact and one item was split. This 11-item measure was used. After this revision, the fit to the Rasch model was acceptable. The generated person estimates were used in the analysis and the logit values ranged from−5.27 to 5.86. The variable was trichotomized, following the same rationale and principles as described above for psychosomatic problems.

Statistical analysis

Contingency tables were used to illustrate the different characteristics of the groups under comparison. Differences in proportions were tested using z-tests (two-tailed), and a p value of $<.05$ was set as the level of statistical significance. These analyses were performed in order to answer the first research question.

Multinomial logistic regression was used in the main analysis to examine the associations between having a disability, parents' achievement expectations, students' own achievement

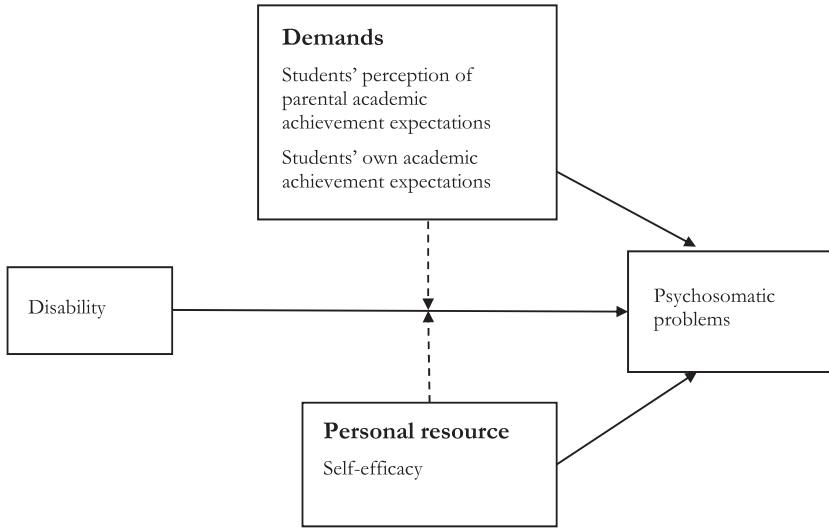

FIGURE 1 Model of analysis. Continuous arrows show main effect analysis, and crosshatched arrows show interaction analysis.

expectations, self-efficacy with psychosomatic problems using both bivariate and multivariate analyses. The analyses were conducted in accordance with the model shown in Figure 1.

In the interpretations of the analyses, the moderate degree of psychosomatic problems (the mid category) was excluded, implying a focus solely on comparing a higher degree of psychosomatic problems with a lower degree. Potential interaction effects were examined using log likelihood ratio tests. Three separate analyses including an interaction term were tested (disability by parents' achievement expectations, disability by students' own achievement expectations and disability by self-efficacy), comparing the full main effects model with each of the three models including an interaction term. Associations between the variables are presented as odds ratios (OR) with 95% confidence intervals.

The analyses were conducted using the statistical software program SPSS, version 26.

RESULTS

The first research question was whether the prevalence of psychosomatic problems, parental and adolescent achievement expectations, and self-efficacy differ between adolescents with a disability and those without a disability. Table 2 shows the proportions and frequencies for all variables, distributed by disability and sex. The table shows that for the whole sample, the degree of psychosomatic problems and self-efficacy varied in regard to whether the adolescent reported having a disability or not. These differences in proportions were statistically significant for all levels of psychosomatic problems and all levels of self-efficacy. The distribution of parents' and adolescents' own achievement expectations did not differ significantly with regard to having a disability or not, that applied to the sample as a whole and when comparing girls with and without a disability as well as comparing boys with and without a disability. Table 2 also shows that compared to girls without a disability, girls with a disability reported higher degree of psychosomatic problems, and lower degree of self-efficacy, and the results were statistically significant. Same pattern was also found among boys, compared to boys without a disability, boys with a

TABLE 2 Proportions and frequencies of adolescents with psychosomatic problems, parents' achievement expectations, students' own achievement expectations and self-efficacy, distributed by disability and sex

	All (*N* 1952)		Girls (*N* 1032)		Boys (*N* 909)	
	With a disability	Without a disability	With a disability	Without a disability	With a disability	Without a disability
	% (*n*)	% (*n*)	% (*n*)	% (*n*)	% (*n*)	% (*n*)
	17.7 (345)	**82.3 (1607)**	**16.4 (169)**	**83.6 (863)**	**19.0 (173)**	**81.0 (736)**
Psychosomatic problems						
Higher degree	39.7 (137)	25.0 (401)	53.8 (91)	36.0 (311)	26.6 (46)	12.0 (88)
Moderate degree	39.4 (136)	48.0 (771)	32.0 (54)	48.1 (415)	46.8 (81)	48.1 (354)
Lower degree	20.9 (72)	27.0 (435)	14.2 (24)	15.9 (137)	26.6 (46)	39.9 (294)
Total	100	100	100	100	100	100
Parents' achievement expectations						
High	24.5 (79)	22.0 (244)	23.0 (37)	19.9 (168)	25.0 (40)	26.4 (172)
Low	75.5 (341)	78.0 (1209)	77.0 (124)	80.1 (676)	75.0 (120)	75.4 (526)
Total	100	100	100	100	100	100
Students' own achievement expectations						
High	45.2 (149)	51.0 (794)	53.7 (88)	59.4 (498)	37.2 (61)	41.2 (292)
Low	54.8 (181)	49.0 (762)	46.3 (76)	40.6 (341)	62.8 (103)	58.8 (417)

TABLE 2 (Continued)

	All (*N* 1952)		Girls (*N* 1032)		Boys (*N* 909)	
	With a disability	Without a disability	With a disability	Without a disability	With a disability	Without a disability
	% (*n*)	% (*n*)	% (*n*)	% (*n*)	% (*n*)	% (*n*)
	17.7 (345)	**82.3 (1607)**	**16.4 (169)**	**83.6 (863)**	**19.0 (173)**	**81.0 (736)**
Total	100	100	100	100	100	100
Self-efficacy						
Lower degree	35.4 (122)	22.1 (356)	32.5 (55)	24.1 (208)	37.6 (65)	19.8 (146)
Moderate degree	45.8 (158)	52.3 (840)	47.9 (81)	53.0 (457)	43.9 (76)	51.6 (380)
Higher degree	18.8 (65)	25.6 (411)	19.6 (33)	22.9 (198)	18.5 (32)	28.6 (210)
Total	100	100	100	100	100	100

Note: Significant differences between proportions are marked with brackets, $p < .05$, two-tailed z-tests.

disability reported higher degree of psychosomatic problems, and lower degree of self-efficacy, and the differences in proportions were statistically significant.

Table 3 presents the results from the multinomial logistic regression analysis investigating the associations between the explanatory variables disability, parents' achievement expectations, students' own achievement expectations and self-efficacy and the outcome variable psychosomatic problems, controlling for sex and school year. The bivariate regressions show that all the explanatory variables were statistically significant and associated with psychosomatic problems. The multivariate analysis shows that the odds of having a higher degree of psychosomatic problems compared to a lower degree of psychosomatic problems were 2.23 times higher among adolescents reporting a disability compared to those not reporting a disability, controlling for parents' and students' own achievement expectations, self-efficacy, sex and school year. Furthermore, the results show that the odds of having a higher degree of psychosomatic problems were 8.78 times higher among adolescents with a lower degree of self-efficacy in comparison with students with a higher degree. As a whole, the multivariate analysis did not change the associations shown in the bivariate analysis between the independent variables and the outcome variable. All associations stayed at the same level of significance in the multivariate analysis as in the bivariate analyses.

TABLE 3 Multinomial logistic regression. Higher versus lower degree of psychosomatic problems. Odds ratios with 95% confidence intervals

	Bivariate analysis	Multivariate analysis
Independent variable	**OR (CI)**	**OR (CI)**
Disability		
Yes	2.06***	2.23***
	(1.51–2.83)	(1.53–3.25)
No	1	1
Parents' achievement expectations		
High	2.31***	2.58***
	(1.72–3.12)	(1.80–3.70)
Low	1	1
Students' own achievement expectations		
High	2.23***	1.67***
	(1.73–2.86)	(1.23–2.26)
Low	1	1
Self-efficacy		
Lower degree	6.99***	8.78***
	(4.82–10.14)	(5.70–13.53)
Moderate degree	2.69***	2.79***
	(1.98–3.66)	(1.96–3.97)
Higher degree	1	1

Note: The variables sex and school year were controlled for in the multivariate analysis.

Abbreviation: df, degrees of freedom.

***$p < .001$.

Analyses of potential interaction effects indicate that the association between disability and psychosomatic problems was not moderated by parents' achievement expectations, students' own achievement expectations or self-efficacy.

DISCUSSION

In this study, the associations between having a disability, parents' and students' own achievement expectations, and self-efficacy and psychosomatic problems among adolescents attending compulsory regular school (i.e., not special school) were examined. The results indicate an association between having a disability and the occurrence of psychosomatic problems. Thus, the odds for severe psychosomatic problems were more than twice as high for students with a disability compared to other students. The results also indicate a very strong negative association between students' self-efficacy and psychosomatic problems, which implies that students with lower self-efficacy are worst of psychosomatically. The results also show that students' and parents' expectations are linked to psychosomatic health, higher expectations are associated with more psychosomatic problems.

In this study, a broad definition of disability including different types of disabilities and chronic conditions was used, thus constituting a relatively heterogeneous group of adolescents with disabilities. However, one argument for having this broad definition is that it seems to exist comorbidity between different disabilities and chronic conditions, and in turn with having different forms of learning disabilities (Blood et al., 2003; Kaczmarek et al., 2016; Pavlou & Gkampeta, 2011; Wassenberg et al., 2010). Nevertheless, some of the research presented in the introduction have been conducted with specific types of conditions (e.g., ADHD or diabetes), which may affect the comparability between our results and this type of research. In accordance with previous research that showed associations between different disabilities and aspects of mental health problems (Brady et al., 2021; Brunnberg et al., 2008; Finning et al., 2022; Fried et al., 2018; Kandemir et al., 2014; Law et al., 2009; Van Eldik, 2005), we found an association between adolescents having a disability and psychosomatic problems.

As reported in the introduction section, a number of researchers have reported lower academic achievement among adolescents with a disability or a chronic condition. While research has proposed that parents' high achievement expectations are a source of distress (Rapus-Pavel et al., 2018), low expectations shape academic skills negatively in young adolescents with a disability (McCoy et al., 2016). Hence, lower academic achievement among young people with a disability or a chronic condition may be a result of parents' lower academic achievement expectations, while high achievement expectations may cause distress. Given these previous reports, we examined whether academic achievement expectations differ between adolescents with or without a disability. Our descriptive analysis did not provide any evidence that either parents' or students' own academic achievement expectations were significantly different among adolescents with and without a disability, respectively. However, it was found that parents' achievement expectations and students' own achievement expectations both are associated with adolescents' psychosomatic problems. The odds of having a higher degree of psychosomatic problems compared to a lower degree were 2.58 times higher among adolescents reporting high parental achievement expectations (controlling for disability and self-efficacy). Regarding students own achievement expectations, the odds of having a higher degree of psychosomatic problems compared to lower degree were 1.67 times higher among adolescents reporting high achievement expectations (controlling for disability and self-efficacy).

Students' own high academic achievement expectations were more common than high parents' achievement expectations, irrespective of having a disability or not. While the students own academic achievement expectations were more common, they showed a weaker association to adolescents' psychosomatic problems compared to parents' achievement expectations.

The data were collected in 2010, and research on the time trends of mental health problems shows that mental health problems have increased among adolescents since then (Bor et al., 2014; Public Health Agency of Sweden, 2018b; van Geelen & Hagquist, 2016). In Sweden, the prevalence of mental health problems has increased among 13-year-old girls from 38% in 2009/10 to 52% in 2017/18 and among 13 year-old boys from 23% to 28%. For 15 year-olds, the prevalence among girls increased from 48% in 2009/10 to 62% in 2017/18 and among boys from 24% to 35% (Currie et al., 2012; Public Health Agency of Sweden, 2018a). In addition, according to research school demands have also increased since 2010 (Public Health Agency of Sweden, 2014). It cannot be ruled out that the increased prevalence may affect analyses of associations.

Interaction effects

The logistic regression analysis did not provide any evidence to support that parents' achievement expectations or students' own academic achievement expectations to moderate the association between disability and adolescents' psychosomatic problems. Hence, the results suggest that academic achievement expectations are independently associated with adolescents' psychosomatic problems. Thus, the strength of the association between disability and adolescent psychosomatic problems was not influenced by academic achievement expectations. The results also showed that self-efficacy did not moderate the association between disability and adolescents' psychosomatic problems. Hence, the impact of self-efficacy on psychosomatic problems is independent of the impact of disability on psychosomatic problems. To our knowledge, no research has investigated general self-efficacy in the context of having a disability. Previous research provides evidence that academic self-efficacy is lower among young people with learning disabilities (Hen & Goroshit, 2014) and girls with ADHD (Major et al., 2013). In this study, however, achievement expectations and self-efficacy instead were independently associated with psychosomatic problems. Thus, efforts to improve students' psychosomatic health may be directed towards initiatives aimed at strengthening student general self-efficacy, and to encourage sound parental as well as student academic expectations.

CONCLUSIONS AND IMPLICATIONS

The results showed strong associations between disability, achievement expectations, self-efficacy and psychosomatic problems. These associations stayed at about the same magnitude and significance level in the multivariate analysis as in the bivariate analyses. Neither parental and student achievement expectations nor self-efficacy did moderate the association between disability and psychosomatic problems.

A potential risk factor identified among all students in this study, regardless of whether or not they have a disability, is achievement expectations—both adolescents' perception of parental expectations and adolescents' own. However, efforts to eliminate academic expectations would possibly have a detrimental impact on academic achievement itself. Finding appropriate level of expectations and increasing educational support is therefore crucial. Finally, strengthening students' self-efficacy may be beneficial for reducing psychosomatic problems among adolescents.

Limitations of the study

First, our study might have benefited by including a larger number of predictor variables, thereby reducing the risk of distorted results because of omitted variables. For example, access to and inclusion of data on school achievement and school absenteeism would have been beneficial for the analyses.

Second, due to the cross-sectional nature of the data, we could not investigate any causal relationships between our explanatory variables and psychosomatic problems. Nor is it possible to determine the direction of the associations, for example if psychosomatic problems are not just affected by disability but also affects the impact of having a disability and/or a chronic condition.

One could argue that the questions used to measure parents' and students' own achievement expectations (*Do your parents place high demands on you to achieve good results/grades at school?* and *Do you place high demands on yourself when it comes to results/grades at school?*) might be considered to lead participants, in so far that they specifically ask for high demands. However, these questions were included in the questionnaire among a battery of questions tapping information about school-related stressors. Hence, the questions were phrased to tap into demanding or stressful aspects that adolescents potentially experience in relation to school and schoolwork.

In this study, general self-efficacy was measured. Whether a situation's specific measure of self-efficacy—for example academic self-efficacy (Elias & Loomis, 2000) or self-efficacy for self-regulated learning (Bandura, 1990)—would have given other associations, or would have worked as a moderator between disability and psychosomatic problems is yet an open question.

- The proportion of adolescents with a higher degree of psychosomatic problems was larger among adolescents reporting a disability.
- To have lower degree of self-efficacy was more common among adolescents with a disability compared to adolescents not reporting a disability.
- Neither parental and student achievement expectations nor self-efficacy did moderate the association between disability and psychosomatic problems.
- Finding appropriate level of achievement expectations and increasing educational support is crucial.

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CONFLICT OF INTEREST

The authors have no conflicts of interest to declare that are relevant to the content of this article.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS APPROVAL

The principals guiding the data collection were reviewed by the ethical committee at Karlstad University, and no objections were raised.

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