



Depressive Symptoms, Somatic Complaints and Exemptions from Graduation Exams in Latvian Adolescents during the Final School Year

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Keywords: Adolescents/ adolescence; Depressive symptoms; Somatic complaints; Gender; Exemptions from exams.

Abstract

Objective: The stress created by final examinations influences the mental, physical functioning, and the adaptation skills in many adolescents. In cases of dysfunctions, students could receive an exemption letter from the final exams. The aim of this study was to investigate the level of depressive symptoms and somatic complaints among final year school students at the beginning and at the end of the final school year and to compare these results based on gender and school type (highly rated and regular secondary schools) and to explore the differences in the level of depressive symptoms and somatic complaints among students who passed the final exams and those who were exempted.

Methods: 287 adolescents (mean age 15.0, Standard Deviation (SD) 0.34 years; 50.5% boys) were enrolled in the longitudinal prospective study conducted in seven Riga's schools. The Achenbach System of Empirically Based Assessment (ASEBA) Youth self-reported scale was used to assess adolescents' depressive symptoms and somatic complaints.

Results: Girls showed a higher level of depressive symptoms in both surveys: 48.1% of girls and 20.2% of boys had depressive symptoms in the first and 44.4% of girls and 18.3% of boys in the second survey, ($p < 0.01$). Girls' median level of somatic complaints was higher in both surveys (girls median = 3.0, boys median = 2.0, ($p < 0.01$)). The level of depressive symptoms significantly correlated with the level of somatic complaints ($r = 0.46$; $p < 0.01$ (1st survey) and $r = 0.58$; $p < 0.01$ (2nd survey)), but not with the school type. The level of somatic complaints decreased statistically significantly between both surveys among adolescents who were exempted from the final exams ($p=0.043$).

Conclusions: Adolescents need special attention before the final school year. Screening for depressive symptoms in adolescents with somatic complaints should be considered.



Introduction

According to the data from World Health Organisation (WHO) one out of six people in the world is an adolescent. The burden of mental health disturbances in adolescents' population was found to be 16%, but unfortunately only half of them received the correct diagnosis and treatment [1]. Adolescence is a specific developmental period of life with many developmental tasks [2]. During this developmental period a lot of biological changes appear and new social roles arise [3,4]. The main tasks, together with biological changes, are the formation of identity and psychosocial maturity. For example, adolescents must form their gender and sexual identity, along with cortical maturation (logical and symbolic thinking) in order to help them learn better ways to control their impulses. In addition, adolescents must learn to accept their weaknesses and strengths, acquire new social and adaptation skills, deal with bodily changes, emotional lability, new social roles and increased peers' influence (and sensitised to peers attitude) [2,5,6]. In favourable circumstances, adolescents are able solve developmental tasks without professional help from a psychologist, psychotherapist, or psychiatrist. Troubled adolescents who receive support from various sources can meet their developmental challenges more successfully than unsupported adolescents [7,8]. On the other hand, unsupported adolescents with adverse experiences could potentially experience mental health disturbances, schooldrop outs, substance addictions and promiscuous behaviour etc. Without professional interventions, unsupported adolescents' problems could deepen and negatively affect their mental and physical health in adulthood [9], (Conway et al., 2017; Frenkel et al., 2015; Hazel et al., 2008; Torres-Berrío et al., 2019). A systematic assistance is necessary to improve the maturation and development of brain circuits, affect regulation and mentalizing capacity in troubled adolescents' [10,8].

Adolescents' development is determined by their environment. Generally adolescents' problems are often related to family dynamics, genetics and trans generational transmission [11,12]. For example, parenting styles strongly influence the developmental passage from childhood through adolescence into young adulthood [13]. It is common that troubled and mentally fragile adolescents and their parents tend to deny their difficulties [14,15,16]. Some researchers have found that parental mental problems increase the risk of similar problems in adolescents' [17,18,19] and it could result in the denial of mental problems in adolescents [14]. This denial of adolescents' problems could result in complications with diagnosis and does result in incorrect or no treatment plans as these families often don't use mental health services [20]. It explains why the first consultation on adolescents' mental health problems could take from one to fourteen years after the actual appearance of the problem [21,22]. However, long-lasting, untreated mental problems are much more severe and difficult to treat compared to the problems that are diagnosed early and treated properly [23,24].

One of the main mental health problems affecting adolescents is depression. It is one of the leading causes of disability in this age group [23,24]. Depression affects various areas: cognitive functioning, academic performance, social relationships, and physical health. It increases the risk of developing addictions, early pregnancies and self-harm [25-28]. In many cases adolescents' mental health problems, such as depression, manifest at age 15 [1]. The mean prevalence of depression among adolescents has been increasing globally over the last few decades [29-31], and it intensified even more during the

Covid-19 pandemic [32-35]. If untreated, adolescent's depression could continue into young adulthood leading to mental and somatic health problems later in life, especially among women [36,37]. Adolescents with existing somatic problems are often at a greater risk of depression [38]. Furthermore depression-connected problems tend to become chronic and results in lower income and weaker social adaptation skills in adulthood [39-42]. This is the reason why early recognition, prevention and treatment of adolescent depression is absolutely essential, especially in adolescents who are suffering from different comorbid conditions [43-46].

We have seen that studies about depression and academic performance are in contradiction to each other [47]. There are studies that have come to a conclusion that academically gifted children are mentally fragile than other students because of poor mental health [48,49]. On the other hand other studies have reached the opposite conclusion – depression could be related to lower academic performance [50,51,46]. Peers play a very influential role in the positive or negative development of adolescents. The mental health of their friends is a very significant factor as it impacts the adolescents' academic performance, social adaptation, coping skills, and their school attendance [52]. Communication with their peers influences the social brain development [8,10].

The female gender is often at a greater risk to lifelong depression due to its vulnerability [52,53], but the male gender is not that often diagnosed with depression due to the various and easily available coping mechanisms and social expectations [51]. During adolescence girls generally tend to manifest internalized problems including depression [55-57] probably due to their fragile and low self-esteem [58,59]. Genetic differences between men and women could be one of the explanations for these findings [60]. Nannick postulated that gender differences in depression could be connected to neuroendocrinological factors such as sex hormones that become active during adolescent development and influence brain development [61]. Furthermore depression could be connected to higher cortisol levels [60,62,63]. If these biological gender differences are combined with adverse interpersonal experiences or even with violence, the tendency towards depression increases even more via neurodevelopmental influence [64,65]. The interaction between biological and environmental factors clearly promotes the development of depression during adolescence [66,20]. In addition, early developmental experiences are important as they influence the formation of attachment style, and relationships between caregivers and children tends to strengthen pathological inclinations during adolescence [67].

If adolescents' depression goes undiagnosed, it can decompensate during stressful life events and even result in suicide attempts [68-70]. Suicide is one of the leading causes of mortality among 15-19 year olds globally [71-73]. Untreated adolescent depression during young adulthood is the most significant contributor to the global disability and suicide death rates [70,73]. In the European Union 3400 young people aged 15-24 died from suicide in 2015 [74].

The diagnosis of adolescent mental health disturbances is a problem in many countries [75,76]. It is well known that some people manifest psychological distress through somatic symptoms as defined by somatization: "it is conversion of a mental state (such as depression or anxiety) into physical symptoms"; also "the existence of physical bodily complaints in the absence of a known medical condition" [77]. In children and adoles-

cents', depression is often connected with different somatic symptoms, including general tiredness [78,79], and sleep problems [80,81]. Therefore, somatic complaints could be the symptom of depression in adolescents (Bohman et al., 2010) similar to that among adults [82].

In Baltic countries, depression is one of the major problems among adolescents similarly to the other world regions [74]. In Lithuania and Estonia, the prevalence of adolescent depression was 5,6% and 5,9% in 2017 respectively [70]. In Latvia, the prevalence of adolescent depression has been growing during the last few decades: from 190 per 100.000 in 2009 to 408 per 100.000 in 2017 [83]. Thirty percent of adolescents had poor self-perceived health, 7% of them felt depressed. The suicide rate among Latvian adolescents aged 11 – 15 was 11 per 100,000 in 2017 (Youth health agency, 2019). In the age group of 15-17, the incidence of new depressive episodes increased from 15.1 (2009) to 32.8 (2020) per 100 000 (Health Statistics Database, 2022). During the Covid-19 pandemic 43% of adolescents perceived their mental health as poor [84]. This is why an early diagnosis and treatment of adolescents with depressive symptoms is extremely important.

The final school year impacts the functioning and adaptation skills in adolescents. Many students get so stressed before and during their final examinations, that some of them even seek exemptions from exams. In Latvia, students whose mental or medical health issues worsen have the option to seek exemption from final examinations. This involves getting a letter of exemption from the family doctor or another medical specialist. This typically happens every spring. In the spring of 2022, it was noticed there was a significant increase in the number of exemption requests from adolescents [85]. However, it is important to investigate adolescents' mental health issues before they graduate to prevent unwanted adverse events. To the best of our knowledge, there has been no previous studies on early identification of adolescents' depression that tend to manifest depressive symptoms at the time of final examinations. As well as there were no studies about the association between depressive symptoms, somatic complaints and the requests for exemptions from final examinations.

The aim of our study was to investigate the level of depressive symptoms and somatic complaints in adolescents during the final school year and to compare the results between adolescents who completed the final exams and adolescents who got exemptions from the final exams. We conducted two surveys: the first survey was conducted at the beginning of final school year and the second one was conducted just before the final examinations.

In our study we formulated the following questions:

1) Are there some differences in the level of depressive symptoms and somatic complaints between both surveys (at the beginning and at the ending of the school year) based on gender and the type of school (highly rated vs regular secondary schools)?

2) Does the level of depressive symptoms and somatic complaints differ between students who passed the final exams and those students who got the exemptions from the final exams?.

Methods

Study design and population

The study was performed in Riga, the capital city of Latvia. In

total, 7 secondary schools took part in the study, comprising 4 regular secondary schools and 3 highly rated secondary schools. At the beginning of the study, eight schools were invited to participate, consisting of 493 parent-student pairs who were at the final year of their studies. When the objectives of the study were explained to parents, 305 (61.9%) parents confirmed the participation of their children in the study and signed the informed consents. However just before the beginning of the study we were forced to exclude one highly rated school from our survey because of a suicide attempt that took place in the school premises just before the first survey. At the beginning of the study, the authors explained the objective of the study to the adolescents (whose parents had agreed to their children's participation in the study). Those students who voluntarily agreed to participate in the study signed the informed consent forms along with their parents. The first survey was performed in November 2018 in order to give the participating adolescents enough time to adapt to the new school schedule after the summer vacations. The second survey was performed in April 2019, just before the final examinations. The study received the ethical approval of the Scientific Research Ethics Commission of the Institute of Cardiology and Regenerative Medicine, University of Latvia (date of approval 28.06.2018).

The level of students' depressive symptoms and somatic complaints

The level of students' depressive symptoms was assessed with the help of the Achenbach System of Empirically Based Assessment (ASEBA) Youth self-report scale, Latvian version. This inventory consists of 112 questions, and it is designed to assess different conditions like affective disorders, anxiety, somatic complaints, attention deficit problems, oppositional challenge disorders, and behavioural problems. We used ASEBA Diagnostic Statistical Manual of mental disorders (DSM)-oriented depressive symptoms scale with 13 questions to assess the students' level of depressive symptoms. There were 3 possible answers to each question: do not agree (0), partially agree (1) and totally agree (2). The total sum of answers across all 13 questions revealed the overall level of depressive symptoms. The possible points range for affective disorders ranged from 0 to 26. These points were totalled and compared with ASEBA Youth self-report scale's norms in Latvia which are as follows: a critical level of depression for girls is > 10, for boys > 8 (> 93 percentiles in the asymmetric scale). The ASEBA reliability (for the Latvian version) in previous studies was α -Cronbach = 0.85.

The somatic complaints were assessed using the ASEBA DSM-oriented somatic complaints scale which consists of seven questions. There were 3 possible answers to each question: do not agree (0), partially agree (1) and totally agree (2). The total sum of answers across all 7 questions revealed the overall level of somatic complaints. The possible points range for somatic complaints ranged from 0 to 13. These points were totalled and compared with ASEBA Youth self-report scale's norms in Latvia which are as follows: a high level of somatic complaints for girls > 6, for boys > 5 (> 93 percentiles in the asymmetric scale). This part of ASEBA reliability (for the Latvian version) in previous studies was α -Cronbach = 0.76.

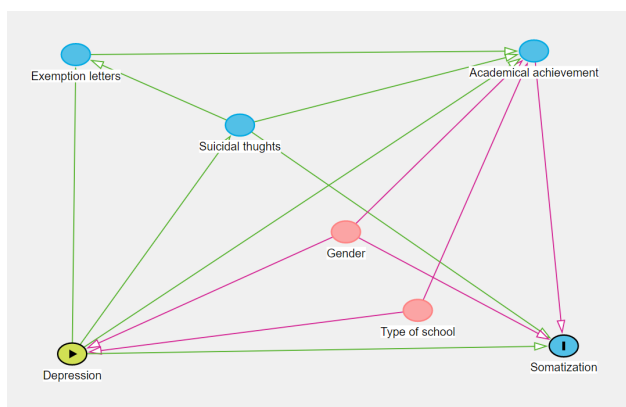
Statistical analysis

Descriptive statistics were performed for all study variables. We described means and standard deviations for normally distributed variables, and medians, minimal and maximal values, and inter-quartile range for variables with distribution other

than normal. For categorical variables we presented frequencies and per cent.

The reliability of answers was checked using α -Cronbach test. Differences in the students' level of depressive symptoms and somatic complaints during baseline and follow up survey were investigated using the Wilcoxon test. We subsequently dichotomized levels of depressive symptoms according to the local gender norms described in ASEBA: for boys, a level higher than 8 and for girls, a level higher than 10 indicated the high level of depressive symptoms. We dichotomized levels of somatic complaints according to the local gender norms described in ASEBA: for boys, a level higher than 5 and for girls, a level higher than 6 indicated high level of somatic complaints. We compared the proportion of students with high level of depressive symptoms and somatic complaints at a baseline and follow-up surveys using the Mc Nemar test. Differences in students with high depressive symptoms and somatic complaints by school types and genders were calculated using the Chi-square test.

Multiple linear regression models were built to investigate the association between depressive symptoms and somatic complaints among last years' Latvian students. The adjustment set for these models was considered based on Direct Acyclic Graf (DAG) diagram [86] and it included school type and gender (Supplement Figure 1). We built the regression models for each one of the time points separately. Effect estimates β and 95% Confidence Intervals (CI) were presented for regression models. All analyses were performed using Statistical Package for Social Sciences (SPSS) 26 version (IBM Corp., 2017). P values < 0.05 were considered as statistically significant.



Sup Figure 1: Direct Acycling Graph of the association between depression and somatisation Supplement Graph 1. Differences between two time points (follow-up minus baseline) in the level of somatic complaints and in the level of depressive symptoms among students who performed final exams (Yes) and among students with exemptions (No).

Results

Study population

Overall, 287 adolescents participated in the study. Among them 207 (72.1%) were from highly rated secondary schools and 80 (29.9%) were from regular secondary schools. We had approximately the same number of boys and girls in the study sample (girls, $N = 141$ (49.5%)). The mean age of the participants was 15.0 years (standard deviation, $SD 0.34$). At the end of the final school year seventeen students (6%) enrolled in our study and were given the exemption letters from the final examinations. Of these, 6 students were from regular schools and 11 were from highly rated secondary schools.

The level of depressive symptoms

The reliability of answers regarding the level of depressive symptoms at the first survey was: α -Cronbach = 0.82, at the second survey α -Cronbach = 0.84 (Supplement Table 1). The median level of depressive symptoms was 7 ($SD 4.75$; range 0.0 – 26.0) at the first survey and 6 ($SD 5.06$; range 0.0 – 23.0) at the second survey (Table 1).

We found that most students were not depressed while participating in both surveys: 63.3% at the first survey and 66.3% at the second survey. The difference in the level of depressive symptoms among students from highly rated and regular secondary schools was not statistically significant in both surveys ($p = 0.1$ at the first and $p = 0.97$ at the second survey). In both surveys girls displayed a higher level of depressive symptoms than boys (Table 1). At the first survey, the majority of students with depressive symptoms were girls and they were from highly rated schools, but these differences disappeared in the second survey (Table 2).

Students who were granted exemption from the final exams had a higher level of depressive symptoms during the first assessment in comparison to students who passed the final exams ($p = 0.03$). However, this relationship disappeared at the follow-up ($p = 0.82$).

The level of somatic complaints

The reliability of answers regarding the level of somatic complaints at the first survey was α -Cronbach = 0.64, at the second survey α -Cronbach = 0.66 (Supplement Table 1). The median level of somatic complaints in girls was higher than boys at both surveys ($p < 0.01$) (Table 1). The majority of the students in our study showed a low level of somatic complaints (89.2% at the first survey and 93.3% at the second survey) (Table 2). According to Mc Nemar's test the level of somatic complaints (low/high) didn't change statistically significantly in girls and boys between both surveys ($p > 0.05$).

The median level of somatic complaints in adolescents who passed the final examinations did not change between both surveys ($Md = 2$ [IQR: 1.00; 4.00] and $Md = 2$ [IQR: 1.00; 3.00] at baseline and at the follow-up). In adolescents with exemption letters, the median level of somatic complaints decreased between the two surveys ($Md = 5$ [IQR: 2.00; 7.00] and $Md = 3$ [IQR: 1.00; 4.00] at baseline and at the follow-up), but this decrease was not statistically significant ($p = 0.22$) (Table 2). Interestingly, the tendency toward somatic complaints decreased statistically significantly between the two surveys ($p = 0.04$) in the group of students with exemption letters (Suppl. Graph 1). In general, the level of depressive symptoms significantly correlated with the level of somatic complaints ($r = 0.46$; $p < 0.01$ and $r = 0.58$; $p < 0.01$ for the first and the second survey, respectively).

In the fully adjusted linear regression model, the level of somatic complaints was positively associated with the depressive symptoms, displaying stronger association at the follow up than in baseline. The male gender was negatively associated with the level of depressive symptoms, and it was the most prominent factor in both surveys. The type of school (whether highly rated or regular) was not associated with the level of depressive symptoms neither in the first nor in the second survey (Table 3). Both models explained approximately 30% of changes, and this parameter (adjusted R^2) was higher at the second survey (0.29 and 0.36, for the baseline and for the follow up).

Table 1: Descriptive statistics of the level of students' depressive symptoms and somatic complaints, by time- point.

	Baseline	Follow-up	p value
Level of depressive symptoms, Median [Q1; Q3] min- max	7.0 [4.0; 10.0] 0.0- 26	6.0 [3.0; 10.0] 0.0- 23.0	0.21
Level of depressive symptoms, girls, Median [Q1; Q3] min- max	8.0 [5.0; 12.0] 0.0-26.0	7.50 [5.0; 12.0] 0.0-23.0	< 0.01
Level of depressive symptoms, boys, Median [Q1; Q3] min- max	5.0 [3.0; 8.0] 0.0-17.0	5.0 [2.0; 8.0] 0.0-20.0	< 0.01
Level of somatic complaints, Median [min; max]	2.0 [1.0; 4.0] 0.0- 13.0	2.0 [1.0; 3.0] 0.0- 13.0	0.15
Level of somatic complaints, girls, Median [Q1-Q3] min- max	3.0 [2.0; 5.0] 0.0-13.0	3.0 [1.0; 4.0] 0.0-11.0	< 0.01
Level of somatic complaints, boys, Median [Q1-Q3] min- max	2.0 [0.0; 3.0] 0.0- 8.0	2.0 [0.0; 3.0] 0.0- 13.0	< 0.01

Table 2: Students with high level of depressive symptoms* and students with high level of somatic complaints**, by time point, type of school and gender.

Survey	Level of comparison	Non-depressive, N (%)	Depressive, N (%)	p value	Low somatic complaints, N (%)	High somatic complaints, N (%)	p value
Baseline		164 (63.3%)	95 (36.7%)	0.28	231 (89.2%)	28 (10.8%)	0.21
Follow- up		169 (66.3%)	86 (33.7%)		238 (93.3%)	17 (6.67%)	
Baseline	Regular school Highly rated school	57 (34.8%) 107 (65.2%)	23 (24.2 %) 72 (75.8%)	0.10	72 (31.2%) 159 (68.8%)	8 (28.6%) 20 (71.4%)	0.95
Follow up	Regular school Highly rated school	47(27.8%) 122 (72.2%)	23 (26.7%) 63 (73.3%)		0.97	66 (27.7%) 172 (72.3%)	
Baseline	Boys Girls	87 (53.0%) 77 (47.0%)	37 (38.9%) 58 (61.1%)	< 0.05	112 (90.3%) 119 (88.1%)	12 (9.68%) 16 (11.9%)	0.72
Follow up	Boys Girls	94 (55.6%) 75 (44.4%)	37 (43.0%) 49 (57.0%)		0.07	123 (93.9%) 115 (92.7%)	
Level of comparison		The level of depressive symptoms, baseline Median [Q1; Q3]	The level of depressive symptoms, follow- up, Median [Q1; Q3]		The level of somatic complaints, baseline, Median [Q1; Q3]	The level of somatic complaints, follow- up, Median [Q1; Q3]	
Students who passed exams		7.00 [4.00;10.0]	6.00 [3.00;10.0]		2.00 [1.00;4.00]	2.00 [1.00;3.00]	
Students with exemption letters		12.0 [7.00;15.0]	6.00 [4.00;10.0]		5.00 [2.00;7.00]	3.00 [1.00;4.00]	
p value		0.03	0.82		< 0.01	0.22	

*The level of depression higher than 7 for boys and higher than 9 for girls.

** The level of somatic complaints higher than 5 for boys and higher than 6 for girls.

Table 3: Association between the level of depressive symptoms and the level of somatic complaints, by time point.

Variables	At the first survey			At the second survey		
	Effect estimates	CI	p value	Effect estimates	CI	p value
Somatic complaints	0.89	0.66 – 1.12	<0.01	1.19	0.96 – 1.41	<0.01
Gender [Boy]	-2.18	-3.24 – -1.12	<0.01	-1.95	-2.97 – -0.93	<0.01
Type of school [highly rated secondary school]	1.02	-0.06 – 2.10	0.06	0.75	-0.37 – 1.87	0.19

Supp Table 1: Reliability of the study inventories, by time point.

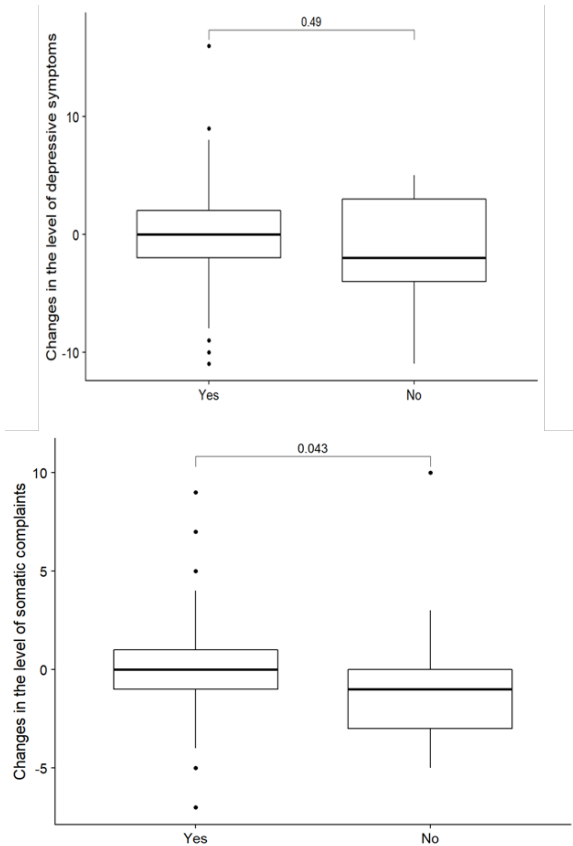
	Baseline, α -Cronbach	Follow up, α -Cronbach
The level of depressive symptoms	0.82 (CI: 0.78-0.85)	0.84 (CI: 0.81-0.86)
The level of somatic complaints	0.64 (CI:0.58-0.7)	0.66 (CI: 0.6-0.72)

Discussion

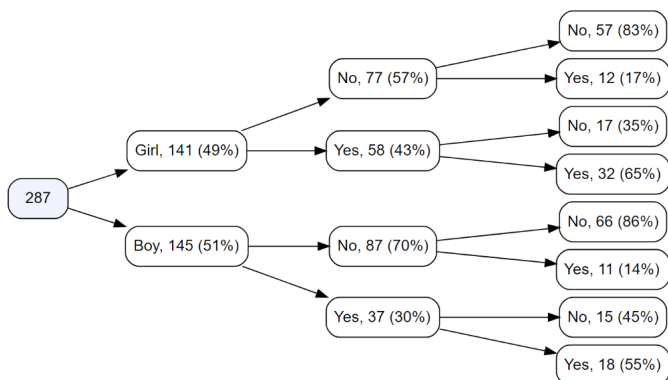
In this study we observed that adolescents (especially girls) need special attention during the final school year due to higher levels of depressive symptoms and somatic complaints. Two factors associated with the level of depressive symptoms were female gender and somatic complaints. Both of these factors increased the possibility of depressive symptoms in the last year

students. At the first survey we found that adolescents who got the exemptions from the final examinations had higher level of depressive symptoms than adolescents who passed exams. Additionally, in the group of students with exemptions the level of somatic complaints decreased between both surveys.

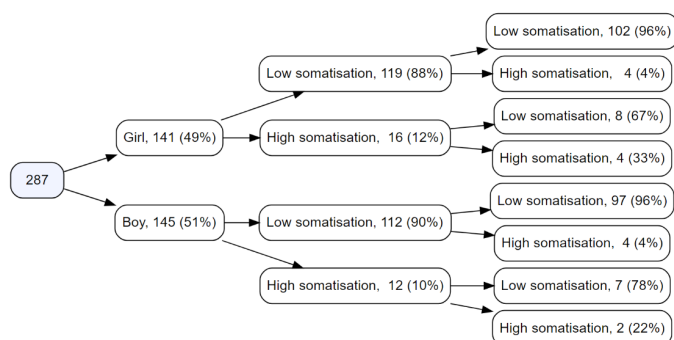
It was not surprising that in our study the number of adolescents with depressive symptoms was higher than in official data. It should be mentioned that in Latvia according to local regulations, only those adolescents who use mental health services are included in the official statistics. Our research, similar to other studies [87], showed higher levels of depressive symptoms among adolescents in Latvia in comparison with officially published data: officially only 7 new cases per year were reported (Health Statistics Database, 2018), whereas in our study



Supp Graph 1: Differences between two time points (follow-up minus baseline) in the level of somatic complaints and in the level of depressive symptoms among students who performed final exams (Yes) and among students with exemptions (No)



Sup Figure 2: Non-depressed (no) and depressed (yes) students by gender at baseline and follow-up.



Sup Figure 2: Students with low and high level of somatic complaints by gender at baseline and follow-up.

33.7- 36.7% of adolescents had depressive symptoms. It could be related to the stigmatization of mental health problems in the Latvian society. Also, parents have low understanding of the importance of mental health among adolescents' as in general Latvians tend to hide their mental health difficulties. This corresponds with similar findings in other countries [88,89].

Another aspect related with poor diagnosis of adolescents' depression could be related with a lack of understanding of mental health problems among primary practitioners. They do not have enough time for consultation and assessment of adolescent mental difficulties, and they don't receive any payment for these procedures (Shahidullah et al., 2018). Primary care specialists and paediatricians often lack knowledge of children and adolescents' mental health and thus lack confidence [88]. At the same time primary care specialists often are the only ones who meet children and adolescents with mental difficulties [89]. Different studies showed that even adolescents who got the proper diagnosis in primary care setting not always had the appropriate treatment for their depression after 3 months. Then the mental health system lost them [7,90-92]. Primary practitioners do not always know about mind- body interaction, including somatic symptoms of depression. So, when adolescents have somatic complaints, both adolescents and the doctor are not able to recognise depression as a cause of suffering. So primary practitioners issue exemption letters from the final exams as they believe that it would help decrease the dysfunction among adolescents. It is a short-term solution. From the developmental point of view exemption letters promotes illness- related behaviour among adolescents in long-term as there's no encouragement to adapt to different life challenges and stress which are necessary for healthy development. It influences identity formation, self-confidence, and social adaptation. The understanding about mind- body interaction is very essential for correct diagnosis of mental health difficulties and their long-term consequences. The Latvian Ministry of Health came out with a policy to improve the situation. The policy had special guidelines for screening of adolescent depression in primary practice during 2021 [93].

Our study showed the gender differences in the level of depressive symptoms. It corresponds with the findings of other authors. Our findings revealed that adolescent girls had more depressive symptoms than boys [94-97,53]. Biological hormonal differences were not the only factor to play a role [98]. Generally girls internalize their difficulties more often, while boys externalize them [56,97].

We found that adolescents with depressive symptoms simultaneously had more somatic complaints [99,100,9]. It is important to pay more attention to adolescents with coexisting depressive symptoms and somatic complaints as their treatment is more complicated. If adolescents have both mental and somatic symptoms their functional impairment and burden of symptoms increases, and the treatment of somatic disease becomes more difficult [25,101,45]. The coexistence of depressive and somatic problems during adolescence influences not only the development of health domains, but also their school education and social adaptation. Additionally, it influences their long-term somatic health perspectives in life [94]. Conversely somatic symptoms and complaints often predict depression [68,82], and chronically ill adolescents often have coexisting mental health problems of which depression is the most common [24].

In Latvia mental, health problems are surrounded by a stigma, while somatic complaints are accepted by the society [102]. Many parents of adolescents are in the dark about the mental problems of their children, and instead they focus on somatic complaints. Additionally, adolescents quite often struggle to describe their mental state, so they speak as their parents do (they complain about somatic symptoms instead of mental difficulties). Adolescents who complain of being exhausted or fatigue should be investigated more carefully as fatigue could be a sign of physical and mental difficulties [103].

Adolescents' mental health problems are often ignored not only by their parents, but also by primary care practitioners [88,24]. Many adolescents visit primary care practitioners because of somatic complaints, but these professionals lack knowledge of adolescents' mental health. Even experienced primary care practitioners could overlook adolescent depression in cases where it manifests as eating disorders, unexplained physical symptoms, school drop outs, substance abuse, weight gain [104]. For example, fatigue, a common symptom, could be connected with somatic illnesses [105], but it could also be a symptom of depression [78]. As adolescent depression is an important concern within the health care system characterized with many long-term consequences, it's very important to recognise that depressive symptoms could combine with unspecific somatic complaints [76,9,100,70]. It is very essential to improve the diagnosis of adolescents' mental health problems within the primary care settings [68]. Undiagnosed adolescent depression creates a vicious cycle: Somatic complaints are mistaken for depressive symptoms > visits to primary care practitioners > wrong diagnosis of adolescent depression > no proper treatment > finally poor prognosis. Training programmes for adolescent mental difficulties have been organized for primary care practitioners in Latvia since Spring 2021 [93].

Due to the Covid-19 pandemic the number of adolescents' depression (with and without self-harm) has increased. Already 42% of adolescents who went for consultation in the outpatient resource centre had depressive symptoms [106] demonstrating the importance of the big need for cooperation between different institutions to tackle this growing problem [98]. WHO recommends implementation of multisectoral, evidence-informed and human-rights-based strategies for the promotion of mental health, prevention of mental health conditions and provision of mental health care for children, adolescents, and their families. It requires cooperation between the health, welfare, and educational systems. Schools should be the first place where students are informed about mental health issues and adolescents with difficulties are identified [107]. If school psychologists screened the students aged 14-15 for depression at the beginning of the final school year, it would help to identify adolescents with mental difficulties early enough to make timely interventions. This could also help the students to develop more adaptively and not to choose exemptions from the final examinations and help them overcome other manifestations of severe depression later in life.

Depression often accompanies reticence. In these cases, the bodily manifestations of internal difficulties as somatic complaints become more important. As our study shows that the depressive symptoms strongly correlate with somatic complaints it would be clinically important to assess depressive symptoms in adolescents with multiple somatic complaints, especially in girls. Primary care practitioners should pay attention to the adolescents with somatic complaints, all of them should be

screened for depression. As the final school year could exacerbate problems, fragile adolescents could be helped if identified in the beginning of the final school year. To achieve it more effectively the cooperation between institutions is much needed and involvement of school psychologists should be considered.

We investigated the level of somatic complaints in connection with exemptions from the final examinations. We found that adolescents with health difficulties got exemptions from the graduation exams if primary care practitioners or other specialists concluded that their health difficulties could negatively influence their functioning during the final exams. In spring 2022 the number of students who sought exemptions from the final exams was extremely high in Latvia [85]. It could be related to the growing number of adolescents with mental difficulties. In our study in the group of students with exemptions the level of depressive symptoms was higher in the baseline, but the level of somatic complaints decreased in the follow up. So, we speculate that somatic complaints would be the indicator of adolescents' mental decompensation due to stress. But somatic complaints disappeared in circumstances with a lower level of stress (exemptions from the final exams). It illustrates that exemptions helped adolescents in the short-term (as somatic complaints decreased), but they did not significantly change the level of depressive symptoms in this group.

From one side short-term exemptions decreased students' decompensations, but from the other side exemptions did not change the internal difficulties per se and did not help them to adapt to stress and develop healthy behaviour [108]. So, adolescents who were not able to tell their parents and other people about their mental difficulties lost the opportunity to say "I feel bad" as their somatic complaints diminished thanks to these exemptions. If we look at health and illness related behaviour in the long-term perspective, new solutions for the problem should be created. And they must be systematic. Without proper diagnosis and help this group of adolescents would have worse prognosis not only in adolescence, but also in adulthood [94,9,109]. We think that exemptions from the final exams are not the best way to help fragile adolescents. On the other hand, it is much more effective in the long-term if fragile adolescents are identified early and given adaptation skills training or other needed therapy. Early interventions would help promote adolescents' brain maturation regarding new adaptation skills, lower the level of somatic complaints and the number of exemptions from the final examinations. In severe cases appropriate psychotherapy treatment including family therapy at the earliest opportunity would be more beneficial. It would prevent not only severe depression, but also improve somatic health, academic achievements, reduce the risk of addictions, early pregnancies, self-harms (including suicides).

Strengths and limitations of the study

One of the most important limitations of our study is the imbalance in a number of participants between highly rated and regular schools, along with a small number of students with exemptions from the final exams. The strength of the study is that it was the first study to assess the final year students using ASEBA both at the beginning and at the end of the final school year. In addition, the study analysed these data in correlation with exemptions from the final exams.

Conclusions

Adolescents, especially girls, need special attention dur-

ing the final school year due to the higher levels of depressive symptoms and somatic complaints. It is important to screen for depressive symptoms in adolescents with somatic complaints and then to treat them as soon as possible. Additionally, the involvement of school psychologists in identifying problematic adolescents should be welcomed and supported. In order to develop an open, systematic and adolescents- friendly health-care system, destigmatization of mental health difficulties in the general society is crucial.

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