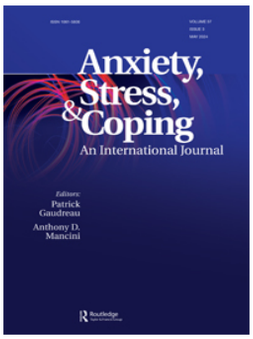

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Anxiety in a COVID-19 school year context: three-way longitudinal study on Slovenian adolescent sample

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ABSTRACT

Background and Objectives: We investigated the trajectories of anxiety, general anxiety and more specifically COVID-19 anxiety in the period of school closure in Slovenia using a longitudinal design with three time points: at the beginning, in the middle and at the end of the school year.

Design and Methods: We have used data from a representative adolescent sample for Slovenia ($n = 1233$) and two anxiety scales: the LAOM Anxiety Scale and the COVID-19 Anxiety Scale. The findings from latent growth curve models show a significant difference in initial levels and a decrease in both types of anxiety as well as an interaction effect between the initial level and the rate of change of COVID-19 anxiety. In addition to investigating the change in time, we were interested in covariates.

Results and Conclusions: The findings show significant effects of: (a) gender, school level and academic achievement on initial levels of COVID-19 anxiety; (b) gender and school level on initial levels of anxiety; (c) gender on the rate of change in anxiety; (d) academic achievement on the rate of change in COVID-19 anxiety; and, additionally, (e) the significant but different role that school belongingness plays in anxiety and in particular COVID-19 anxiety.

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Anxiety; COVID-19 anxiety; gender; grades; school belongingness; adolescence

Slovenia had one of the longest school closures in the second wave of the pandemic (2020–2021) when compared to other EU countries (UNESCO, 2022). Adolescence, however, is characterized by ongoing changes in physical, psychological and social dimensions, and to achieve healthy growth and development, adolescents need to have a sense of belonging, achievement and independence (Steinberg, 2004), with these all being affected during the COVID-19 school closure period. In the current study, we investigate the trajectories of anxiety, general anxiety and more specifically COVID-19 anxiety in this, very specific, COVID-19 school year in a representative sample of adolescents in Slovenia. In addition to investigating the change over time in both types of anxiety, we are also interested in school-specific covariates such as school level (lower or upper secondary), academic achievement and the sense of school belongingness, in addition to investigating gender as a covariate of changes in anxiety over time.

The ongoing COVID-19 pandemic and the restrictions imposed by governments in order to prevent the spread of the virus have challenged mental health and well-being globally (e.g., Elmer et al., 2020; Moccia et al., 2020; Wang et al., 2020). While countries initiated a series of measures aimed at controlling the pandemic, including bans on local and international travel, as well as on

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large gatherings, suspension of public transport, social distancing, stay-at-home orders and curfews, and school and university closures. The latter, particularly the closure of schools, is one of the measures that has affected children and adolescents most. Formal education, which was originally carried out face to face in schools, shifted to online or virtual home teaching and learning activities. The closure of schools, in addition to its impact on academic achievement (e.g., König & Frey, 2022), removed one of the most important contexts for social and emotional development in adolescence (Schaffer, 2009), and in doing so presented a risk factor for the development of mental health difficulties, such as anxiety (Schaffer, 2009), which has been one of the most frequent mental health issues during this period (Hicks & Heastie, 2008; Kozina, 2014; Neil & Christensen, 2009). In this study, we focus on two types of anxiety, one general and one very specific, i.e., situational COVID-19 anxiety, to see how these changed over a school year with more than half of school time spent online. In Slovenia, schools were closed from October 2020 to March 2021.

There are several triggers for bursts of anxiety during school closures, e.g., the presence of threat, insecure future prospects, social isolation and loneliness. COVID-19 as a real health threat provided an additional threatening stimulus. And since overestimating neutral events as threatening is one of the characteristics of anxious response (Abramowitz & Blakey, 2020), increased anxiety is expected. In addition, an insecure and unpredictable future plays a similar role in maintaining or fostering anxiety (Jacoby, 2020). During the period of COVID-19 restrictions there were no clear signs as to when the school closures and other restrictions would end. One of the additional triggers of anxiety during school closures was loneliness. When schools are closed, adolescents are more likely to experience loneliness, and when adolescents experience isolation and loneliness, they are more likely to suffer high rates of anxiety (and depression), including once the enforced isolation resulting from the COVID-19 pandemic has ended. Research shows that the longer isolation continues, the greater the likelihood of an increase in anxiety and depression (Loades et al., 2020). According to Loades et al. (2020), children who have experienced isolation or quarantine are five times more likely to require mental health services. And as responses to the educational disruption survey REDS showed, 53% of young people in Slovenia reported increased levels of loneliness during COVID-19 school closures (Klemenčič Mirazchiyski et al., 2021).

Changes in anxiety and COVID-19 anxiety during the COVID-19 pandemic

There are now numerous cross-sectional examples of the negative impact of the COVID-19 pandemic on mental health in both adult and adolescent samples. Systematic reviews about the impact of the COVID-19 pandemic on psychological response reported high levels of depression (21.94–33.7%), anxiety (13.29–31.9%) and stress (13.29–29.6%) (Cénat et al., 2021; Salari et al., 2020). Furthermore, in a study based on data from 67 countries, depression levels increased by 21.62%, anxiety levels by 16.71% and stress levels by 21.8% during the COVID-19 pandemic when compared to the time before the pandemic (Ugbolue et al., 2020). Furthermore, in its global monitoring of mental health, the OECD has identified an increase in mental health problems, e.g., anxiety and depression, compared to the pre-COVID-19 time, peaking at the beginning of the pandemic (Hewlett et al., 2021). Compared to older age groups, adolescents are reported to be more at risk of negative mental health-related outcomes associated with COVID-19 (Fancourt et al., 2021; Généreux et al., 2020; Zhou et al., 2020).

In addition to cross-sectional pre-/post-COVID-19 pandemic comparisons, longitudinal studies provide further insights. A Canadian longitudinal study on adult samples showed stable levels of anxiety and an increase in depressive symptoms (Watkins-Martin et al., 2021). However, results varied as a function of pre-pandemic levels of depression and anxiety: depression and anxiety symptoms increased among adults with the lowest levels of symptoms before the pandemic, while they decreased among those with the highest. Similarly, an emerging study on adults in Switzerland has also shown stability in depression and anxiety symptoms when comparing symptoms before and during the pandemic (Shanahan et al., 2001). In contrast, a longitudinal study in Belgium showed

a decrease in anxiety from the beginning of the pandemic (Bruggeman et al., 2022) while also stressing alignment with the strictness of the measures imposed; more specifically, anxiety was higher in times of stricter closures. A decrease in anxiety was also detected in the first 20 weeks of the pandemic in England (Fancourt et al., 2021). A meta-analysis of 65 studies showed an overall increase in mental health symptoms, which was most pronounced at the beginning of the pandemic (March, April 2020) before significantly declining over time (May, June 2020), with increases in depression and mood disorder being greater than for anxiety (Robinson et al., 2022).

A different picture is evident when reviewing studies on adolescent samples, showing an increase in symptoms of anxiety and depression from before to during the pandemic (Li et al., 2020). Interestingly, while anxiety levels peaked and subsequently declined in adult samples, they either remained stable or continued to increase in the case of adolescent samples, as revealed by Racine et al. (2021). The heterogeneity of findings can be attributed to variations in the experiences and coping mechanisms among different age groups, thereby placing the younger population at a heightened level of vulnerability. Recent studies (Hawes et al., 2022; van Loon et al., 2022; Wang et al., 2020) using samples of adolescents are adding additional insight into the development of anxiety during the COVID-19 pandemic. For instance, Wang et al. (2020) reported an increase in anxiety using a longitudinal design on a sample of college students (aged around 20) in China. Hawes et al. (2022) longitudinally followed adolescents (aged around 15) and young adults in the USA and came to the same conclusion. In contrast, in the Netherlands, van Loon et al. (2022) reported stable trajectories in the level of anxiety of adolescents (aged between 11 and 15) as the pandemic progressed. One of the reasons for not detecting changes in anxiety as discussed by van Loon et al. (2022) could be that the time of the measurement corresponded with the measures taken to prevent the spread of COVID-19 more relevant for adults and not so much for the adolescents. The same explanation is provided by Ertanir et al. (2021) for not detecting changes in anxiety levels in a sample of Swiss adolescents. As school is one of the most significant contexts for adolescents' development, there are several school-level and individual-level influences that need to be taken into consideration.

School level influences on anxiety and COVID-19 anxiety

Anxiety both interferes with, and is affected by, school processes, e.g., the progression of the school year, grading and social networks. Firstly, general anxiety is negatively correlated with academic achievement in both clinical and non-clinical samples and in different age groups, i.e., at the primary and secondary level of education (Mazzone et al., 2007). Adolescents who feel more connected to school report lower levels of anxiety than those who do not feel any connection (Allen et al., 2018).

Secondly, it has been established that social support serves as a recognized protective factor in response to prolonged lockdowns, contributing to flatter anxiety trajectories (Wang et al., 2020). When school closures occur, social support from the school and relationships with peers and with teachers are lacking. Thirdly, anxiety is also associated with school level. For instance, students in recent years have been found to be more prone to higher anxiety levels, presumably as a result of increased insecurities due to transition and the obstacles imposed by the COVID-19 pandemic (Wang et al., 2020). During the COVID-19 pandemic, research conducted by Hawes et al. (2022) utilizing samples from the United States revealed a significant correlation between school-related concerns and heightened anxiety levels.

Individual-Level Influences on anxiety and COVID-19 anxiety

It is important to recognize that the impact of the pandemic on anxiety levels may not be uniform across all individuals. Gender, in anxiety research literature, is the factor that has been most widely associated with anxiety, with the female gender being most affected. There are numerous instances

where gender has been observed to play a significant role in response to the COVID-19 pandemic. For example, research across six Middle Eastern countries showed gender to be a significant predictor of anxiety during the COVID-19 pandemic (Omari et al., 2020). Similarly, evidence of gender shaping the response to COVID-19 anxiety also comes from longitudinal research using samples of adolescents (Ertanir et al., 2021; Hawes et al., 2022; Wang et al., 2020). The higher levels of anxiety in females can be attributed to them being more prone to develop internalizing difficulties after being exposed to stress and trauma (Tolin & Foa, 2008). As for specific COVID-19 anxiety, meta-analytical research (Metin et al., 2022) has also shown that gender has a statistically significant effect on COVID-19-related fear and anxiety in favor of females. With regard to age, it is well documented that anxiety tends to increase during adolescence (Silverman & Treffers, 2022). This can be attributed, in part, to cognitive development and the higher levels of abstract reasoning that fuel worries, including concerns related to COVID-19.

Current study

In the current study, we will longitudinally analyse the changes in anxiety in one school year in the COVID-19 context – more particularly, changes in general anxiety, and specifically COVID-19 anxiety, from the beginning to the end of the school year. In the targeted school year, adolescents attended classes online for most of the year, therefore we expect an increase in general anxiety, and COVID-19 anxiety in particular, from the beginning to the end of the school year. Additionally, we will test whether the initial levels of anxiety and the rate of change vary across gender, school level, academic achievement and school belongingness.

We expect significant initial differences in the general anxiety level according to gender, with females reporting higher levels than males. Additionally, we expect a steeper rate of increase in general anxiety among males, as they tend to have lower initial levels of anxiety (e.g., Fancourt et al., 2021; Shanahan et al., 2001).

We expect significant initial differences in general anxiety in terms of academic achievement, with students who perform at a higher level reporting lower general anxiety.

In terms of the transition to a new learning environment, namely online schooling, we posit that the process of adaptation may not pose as significant a stressor for high-achieving students as it does for low-achieving ones. Consequently, we anticipate that the general anxiety levels of low-achieving students will see a steeper increase than those of high-achieving students. In low-achieving students, general anxiety will also increase more steeply. This heightened increase can be attributed to the cumulative physiological and psychological burden, known as "allostatic load", associated with the ongoing experience of online schooling (Guidi et al., 2020; Kozina et al., 2022). We also assume there will be a similar pattern of associations for COVID-19 anxiety.

We expect significant initial differences in general anxiety in terms of school level. Specifically, we expect that upper secondary students, who are older, will report higher levels of general anxiety than lower secondary students. Additionally, we anticipate a more pronounced increase in COVID-19 anxiety among upper secondary than among lower secondary students. This expectation arises from the understanding that older students may have a greater awareness of the implications and potential risks associated with the COVID-19 pandemic, leading to heightened anxiety levels.

We expect significant initial differences in general anxiety in terms of school belongingness: adolescents with low school belonginess will report higher levels of anxiety than those with high school belonginess. Furthermore, we anticipate a more pronounced increase in general anxiety among students who feel a stronger connection to their school. This increase is expected to be greater than among those who do not experience the same level of connection. This expectation arises from the understanding that the school closure period entails withdrawing the context to which students feel connected, potentially exacerbating their anxiety levels.

To the best of our knowledge, there is a dearth of longitudinal studies that have examined changes in anxiety within a single school year during the COVID-19 pandemic, particularly in

samples of adolescents. Our study aims to address this research gap by specifically focusing on one school year and aligning it with the COVID-19 measures that are most relevant to adolescent populations, such as school closures. Furthermore, we have noted a lack of studies investigating anxiety during the COVID-19 school year, as well as a scarcity of such studies in normative school years. Moreover, there exists a discrepancy between studies conducted in different contexts, such as China (Wang et al., 2022), the USA (Hawes et al., 2022) and Europe (van Loon et al., 2022). Therefore, it is crucial to conduct research in new contexts to gain a comprehensive understanding. Depression, anxiety and stress are the most common mental difficulties in adolescence even without an additional global trigger such as the COVID-19 pandemic (Hicks & Heastie, 2008). Hence, research in the time of the pandemic, particularly longitudinal research, becomes even more necessary. A review conducted by Prati and Mancini (2021) on longitudinal studies examining the psychological impact of COVID-19 identified a total of 25 studies that focused solely on adult samples, highlighting the lack of studies that specifically investigate adolescents.

Methods

Sample and procedures

As the study is part of a larger data collection (*Positive Youth Development in Slovenia: Developmental Pathways in the Context of Migration*), the sampling targeted all lower and upper secondary school types, taking into consideration the proportion of students that attended each type of school in Slovenia and the number of additional hours of Slovenian language per school. All lower and upper secondary schools were divided into two groups according to the number of additional hours of Slovenian language that was offered to migrant students. Those lower and upper secondary schools with the highest number of additional hours of Slovenian language for migrant students were invited to participate in the study. Concurrently, a random sampling technique was employed to sample lower and upper secondary schools that did not provide additional hours of Slovenian language instruction for migrant students. These schools were then invited to participate in the study. When schools agreed to participate, we then randomly selected two classes per upper secondary school to participate in the study, while all classes from each selected lower secondary school were included in it. After obtaining informed consent from the parents of underage students, the students responded either on paper or online due to the COVID-19 restrictions.

The duration of data collection was not constrained, with participants taking an average of 30 min to complete the survey. The survey consisted of positive (e.g., empathy) and negative (e.g., anxiety, victimization) indicators of adolescents' development. The data collection was supervised by the school coordinator (teacher or school counsellor), who assisted students' when necessary. The first data collection (i.e., T1) took place during the second wave of the COVID-19 pandemic in Slovenia (between October and December 2020). As part of the subsequent restrictions, there was a school lockdown with remote schooling that began on 19th October. The second data collection (i.e., T2) took place between January and March 2021 (with school lockdown still ongoing). The lower secondary school students went back to school after 15th February while the upper secondary students returned after 8th March. The third data collection (i.e., T3) took place between May and June 2021 with all the students back in school. The initial sample of the current study (i.e., T1) included 1,984 participants (57.4% female, 42.5% male, 0.1% non-binary), aged 13–19 ($M = 15.34$; $SD = 1.19$). The majority of participants were attending one of 20 upper secondary schools (1,406 students; 70.8%; 57.8% females). The age of these students varied from 14 to 19 ($M = 15.91$; $SD = 0.91$). The rest of the participants were attending one of 21 lower secondary schools (578 students; 29.7%, 56.3% females) and were aged between 13 and 16 ($M = 13.96$; $SD = 0.38$). In the study we have used data from participants that were involved in all three waves of data collection, i.e., 1,233 participants (59.6% female, 40.3% male and 0.2% non-binary) aged between 13 and 19 ($M = 15.33$; $SD = 1.20$). The sample used does not differ significantly in age (F (1900) = 0.597; $p = 440$), gender proportions ($Z =$

1.704, $p = 0.088$) or initial level of anxiety (F (1903) = 0.827; $p = 363$) and COVID-19 anxiety (F (1903) = 3.365; $p = 0.067$) from the overall sample. The current study was approved by the Committee for Ethical Research at the Faculty of Arts of the University of Maribor.

Measures

The measurement battery consisted of questionnaires tapping indicators of positive adolescents' development. In the current study, in line with the research aims of the study, a selection of measures was used. The same mesures were used for all three time points.

The LAOM Anxiety Scale (Kozina, 2012) was used to measure general anxiety and the three components of anxiety: emotions (e.g., "I feel uncomfortable and I don't know why"), decisions (e.g., "I have troubles deciding on one thing") and worries (e.g., "I worry a lot"). The scale consists of 14 items. Participants indicated the extent to which the statements were true for them (1 = "never" to 5 = "always"). The reliability and validity of the instrument have been well documented in Slovenian samples (Kozina, 2012). Cronbach's alpha in our study was .906 in T1, .922 in T2 and .926 in T3. CFA for hierarchical multidimensional structure showed adequate fit across all three measurement points (T1: RMSEA = .077; CFI = .922; T2: RMSEA = .080; CFI = .929; T3: RMSEA = .082; CFI = .923).

COVID-19 anxiety was used to measure specific situational anxiety during the pandemic. We created four items based on the items (e.g., "I am worried about getting infected with COVID-19") from the LAOM Anxiety Scale (Kozina, 2012), with the aim of capturing anxiety specific to the COVID-19 pandemic in a study on psychological response to the COVID-19 pandemic (Kozina et al., 2021). Participants indicated the extent to which the statements were true for them during the COVID-19 pandemic (1 = "never" to 5 = "always"). Cronbach's alpha in our study in waves 1, 2 and 3 was .823, .848 and .867, respectively. CFA showed adequate fit across all three measurement points (T1: RMSEA = .069; CFI = .974; T2: RMSEA = .094; CFI = .965; T3: RMSEA = .077; CFI = .973). In line with modification indices, error terms were allowed to covary when theoretically justified.

School belongingness

Students' sense of belongingness at school was measured using a scale designed and used in the OECD's Programme for International Student Assessment (PISA) (OECD, 2020). The measure reflects how accepted, respected and supported students feel in their social context at school. Students reported their sense of belongingness in seven items (e.g., "I feel like I belong at school") using a four-point rating scale (1 = strongly disagree to 4 = strongly agree). Cronbach's alpha in our study was .819 in T1, .810 in T2 and .799 in T3. CFA showed adequate fit across all three measurement points (T1: RMSEA = .044; CFI = .993; T2: RMSEA = .068; CFI = .984; T3: RMSEA = .066; CFI = .981). In line with modification indices, error terms when theoretically justified were allowed to covary.

Gender (the open-ended question *What is your gender?* was recoded as 1 = female, 2 = male, 3 = other) and age (open-ended question: *What is your age?*) were included in a set of demographic variables.

Academic achievement was assested with a question *What are your average grades like?* (1 = mostly insufficient; 2 = mostly sufficient; 3 = about half sufficient and half fair; 4 = mostly fair; 5 = about half fair and half good; 6 = mostly good; 7 = about half good and half excellent; 8 = mostly excellent).

Data analyses

As a preliminary analysis, the data were screened for the number and patterns of missing values at each time point separately. The anxiety items had 0.7% missing values at the first measurement time, 1.4% at the second measurement point and 0.6% at the third measurement time. The COVID-19 anxiety items had less than 0.8% missing values at the first measurement time, 1.4% at the second measurement point and less than 0.9% at the third measurement time. After examining

the descriptive statistics, correlations and reliabilities (using IBM SPSS Statistics 28) we then employed latent growth curve models (LGCMs) to examine the longitudinal change over time using Mplus (Version 8.6; Muthén & Muthén, 1998–2021). Manifest variables for anxiety were entered into the models, and a robust maximum likelihood (MLR) algorithm was used to assess model parameters. With the maximum likelihood algorithm, the estimates of parameters and their standard errors are based on all available data (Peugh & Enders, 2004). First, we estimated the unconditional LGCMs, where the latent factors (intercept and slope, the parameters describing the growth curve) were created for two observed repeated measures: general anxiety and COVID-19 anxiety. This allowed us to examine the intra-individual change over time. The intercepts were constrained to be equal (i.e., they were fixed to 1) and values assigned to the factor loadings of the slope reflected the data collection time intervals (i.e., each value represented three months). In the second step, conditional LGCMs were examined by adding covariates into the model (gender, age, school belongingness) at the individual level (estimating the effects of the covariates on the latent growth parameters). A direct effect of the covariates enabled us to examine whether the covariates explained (some of) the inter-individual differences in the growth curves (Stoel et al., 2004). As school belongingness changes throughout the school year, it was included as a time-variant covariate, while gender, school level and academic achievement were included as time-invariant covariates. The following cut-off values were applied for adequate fit: CFI > 0.90, RMSEA < 0.08 and SRMR < 0.08 (Hair et al., 1998).

Results

Descriptive results

Means and standard deviations of anxiety and COVID-19 anxiety at the three time points are presented in Table 1. Skewness and kurtosis values for all included variables are all between −2 and 2 and considered acceptable.

Based on the descriptive statistics we observed a decrease in both general anxiety and COVID-19 anxiety from T1 to T3.

Latent growth curve models

Unconditional LGC models

Unconditional LGCMs (measurement models, without covariates) were used to calculate the intra-individual differences in the growth curve of anxiety and COVID-19 anxiety over three time points (within-person model) in one school year.

Table 2 shows that both unconditional LGCMs have a good fit with the data. In both models, the means and the variances of the intercept (the average initial levels and the inter-individual differences in the initial levels of general anxiety and COVID-19 anxiety) were statistically significant. In both models, the average intra-individual change (the mean of the slope) was statistically significant, with negative values indicating a significant rate of decrease in the measured concept over time. A significant negative covariance between the intercept and slope (describing the relationship between the starting point and the rate of change) is present in COVID-19 anxiety, indicating that higher initial levels of COVID-19 anxiety are related to a flatter slope in COVID-19 anxiety over time.

Table 1. Means and Standard Deviation of General Anxiety and COVID-19 Anxiety for the Three Time Points.

	T1		T2		T3	
	M	*SD*	*M*	*SD*	*M*	*SD*
Anxiety	2.875	0.776	2.783	0.830	2.692	0.854
COVID-19 anxiety	3.012	0.948	2.849	0.984	2.532	0.968

Table 2. Unconditional LGC Model Parameters and Fit Indices of the Anxiety and COVID-19 Anxiety over Three Time Points.

	Intercept			Slope		Model fit		
	M	Var	*r* (Intercept x Slope)	*M*	Var	CFI	RMSEA	SRMR
Anxiety	2.775***	0.022	0.016	−0.047***	0.010	0.999	0.019	0.007
COVID-19 anxiety	3.008***	0.027	−0.083**	−0.240***	0.013	0.993	0.063	0.015

Notes: *** $p \leq 0.001$; ** $p \leq 0.05$

Conditional LGC models

We present the findings of the conditional LGCMs separately for anxiety and COVID-19 anxiety, with three covariates (gender, school level, academic achievement) included as time-invariant predictors of the intercept and slope and one covariate (school belongingness) included as a time-variant covariate. This allows us to explain the variation of parameters between individuals.

The LGCM for general anxiety (Figure 1), with the three time-invariant covariates and one time-variant covariate, yielded mixed findings regarding the fit to the data: CFI = .902, RMSEA = .086, 90% CI [.072, .102], SRMR = .103. While CFI shows adequate fit, SRMR and RMSEA are out of the range of adequate fit, although still, in the case of RMSEA, very close to the 0.08 that was used as a threshold (Hair et al., 1998). The model shows gender being significantly associated with the intercept of general anxiety, indicating that the initial levels of general anxiety vary across genders. Females report higher general anxiety. School level is significantly associated with the initial level of general anxiety and not the rate of change. Students at upper secondary school level report higher general anxiety. Academic achievement is associated with the rate of change in general anxiety over time (more in Figure 2). School belongingness is a significant predictor of general anxiety at all three time points, and students that report a higher sense of school belongingness report lower anxiety.

The LGCM for COVID-19 anxiety (Figure 3), with the three time-invariant covariates and one time-variant covariate, showed an adequate fit to the data: CFI = .999, RMSEA = .009, 90% CI [.000, .033], SRMR = .019. Gender is significantly associated with the intercept and slope of COVID-19 anxiety, indicating that the initial levels and the rate of change of COVID-19 anxiety vary across genders. Females report higher COVID-19 anxiety. School level and academic achievement are significantly associated with the initial level of COVID-19 anxiety and not the rate of change. Students at upper secondary school level and those with higher academic achievement both report higher COVID-19 anxiety. School belongingness is a significant predictor of COVID-19 anxiety at all three time points. Students that report a higher sense of school belongingness report higher COVID-19 anxiety.

While males exhibit stable COVID-19 anxiety over time, females show a decrease from T1 to T2 and an increase from T2 to T3 (Figure 4).

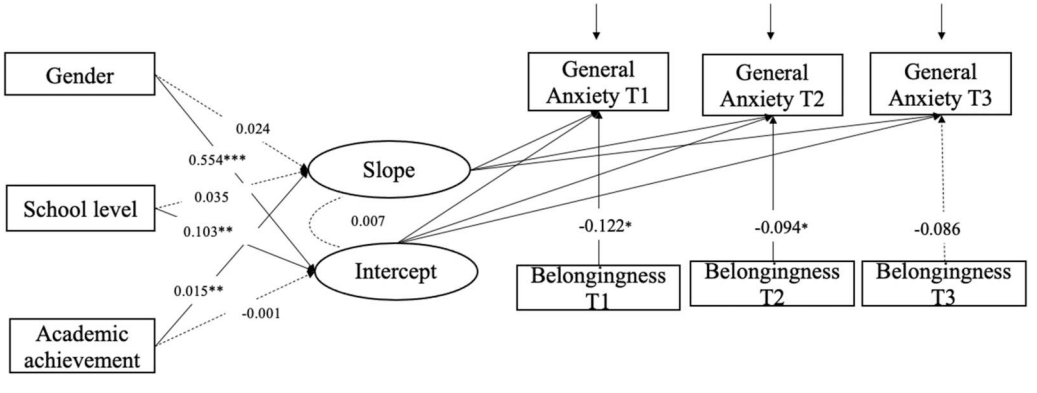

Figure 1. The Conditional LGCM for General Anxiety, Measured at Three Time Points (T1–T3), Including Three Time-Invariant Covariates (Gender, School Level, Academic Achievement) and One Time-Variant Covariate (School Belongingness). Notes: The estimates are unstandardized coefficients. Solid lines represent significant paths and dashed lines indicate non-significant paths; * $p < .10$; ** $p < .05$; *** $p < .01$.

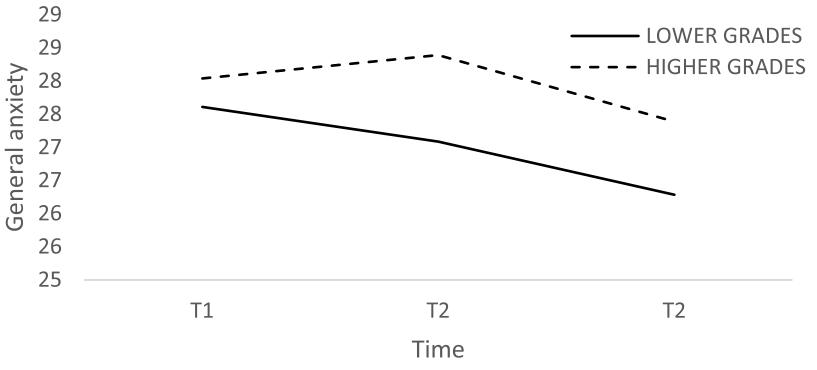

Figure 2. General Anxiety at Three Time Points in Students with Higher Academic Achievement (Mostly Grades 4 and 5) and Lower Academic Achievement (Mostly Grades 1, 2 and 3). Notes: Students with lower grades show a stable decrease in general anxiety from T1 to T3, while students with higher grades show an increase in general anxiety from T1 to T2 and then a decrease to T3.

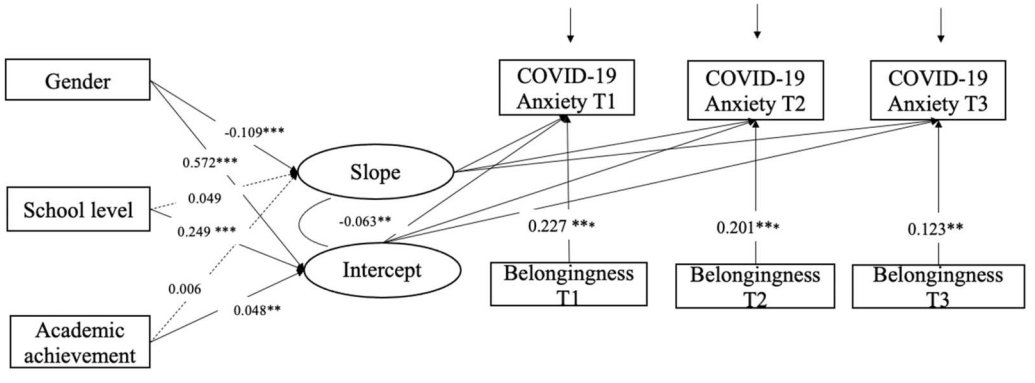

Figure 3. The Conditional LGCM for COVID-19 Anxiety, Measured at Three Time Points (T1–T3), Including Three Time-Invariant Covariates (Gender, School Level, Academic Achievement) and One Time-Variant Covariate (School Belongingness). Notes: The estimates are unstandardized coefficients. Solid lines represent significant paths and dashed lines indicate non-significant paths; * $p < .10$; ** $p < .05$; *** $p < .01$.

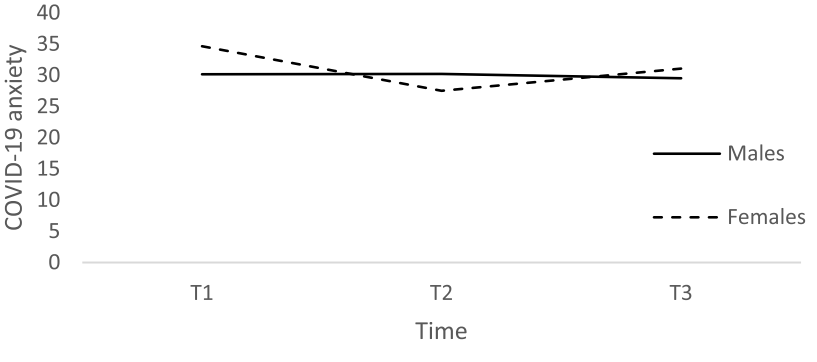

Figure 4. COVID-19 Anxiety at Three Time Points in Male and Female Students.

Discussion

In this study, we longitudinally followed anxiety and COVID-19 anxiety in a representative sample of Slovene adolescents in a COVID-19 school year in which the longest school closure in Slovenian

history took place. Given the well-documented empirical evidence of COVID-19 having a negative effect on mental health, especially in adolescence, research in this field is much needed. School itself and the processes of a school year (e.g., uncertainties at the beginning and final exams at the end of the school year) are important contextual influences on the development of anxiety, and even more so in the presence of a new stressor such as the COVID-19 pandemic and its restrictions.

Changes in anxiety and COVID-19 anxiety in the pandemic school year

In observing the changes in anxiety and COVID-19 anxiety over time, we focused both on the initial differences and the rate of change over time. Firstly, findings from the unconditional curve model show significant differences in initial levels of anxiety and COVID-19 anxiety (significant intercept), indicating significant variability in the anxiety responses and responses to COVID-19. Secondly, the change over time was significant for both anxiety and COVID-19 anxiety, showing a significant decrease from the beginning to the end of the school year. This was contrary to our expectations. Based on previous research, both cross-sectional and longitudinal (Hewlett et al., 2021; Watkins-Martin et al., 2021), we hypothesized an increase in anxiety from the beginning to the end of the school year. However, we made our predictions based on studies comparing the pre-COVID-19 time and COVID-19 measurement or longitudinal monitoring (mostly adults) from the beginning of the COVID-19 pandemic. There was, however, a mix of research findings when focusing solely on the adolescent samples, with some of them showing an increase (Racine et al., 2021; Wang et al., 2020), while others, i.e., European (van Loon et al., 2022; Ertanir et al., 2021), reported stable levels of anxiety. Here we can see, on the one hand, how important it is not to make assumptions and predictions for adolescents based on adult samples, and on the other hand, how important the context in which the measurement takes place is.

For instance, in the case of our data collection, it is important to note that our initial measurement took place when the pandemic had been ongoing for six months. That means that initial levels of anxiety measured were already encompassing a certain type of adaptation to the new COVID-19 reality. Additionally, the initial measurement took place at the beginning of the school year, which involves two important triggers of higher anxiety. Firstly, the beginning of the school year is stressful in its own right in all school years, e.g., new classes, new classmates, even a new school for some. Secondly, it is noteworthy that the initial measurement coincided with the official announcement of school closures during the specific COVID-19 academic year in Slovenia. School closure, which is a stressor in itself, was accompanied by high uncertainty and unpredictability about when it was going to end, the latter being a result of the restrictions from the first six months in Slovenia being constantly prolonged. For instance, it was announced that the school closure in spring 2020 would last for two weeks, but after these two weeks had passed, it was prolonged on a weekly basis. This could contribute to higher anxiety at the initial measurement point. Further evidence supporting the notion of these periods being associated with heightened anxiety levels can be found in a cross-sectional study conducted in Slovenia comparing anxiety and COVID-19 anxiety among adults during spring 2020, autumn 2020 and spring 2021. The study revealed that the highest levels of COVID-19 anxiety were found during autumn 2020, as reported by Kozina et al. (2021).

After being at its highest level at the beginning of the school year, the anxiety reported in our sample had decreased by the middle of the school year and even more so by the end of the school year. We would, however, have expected a rise at least until the middle of the school year as the school closure was in full swing. We can assume that a certain level of adaptation was established. The final measurement took place at the end of the school year, which can bring relief in normative years, but in this specific school year it was also associated with the end of school closure and being the beginning of face-to-face school processes once again. Our data also revealed a significant association between the initial level of COVID-19 anxiety and the rate of change in this level throughout the school year. The higher the COVID-19 anxiety at the beginning of the school year, the flatter

was the decrease over time. The relationship was not there for general anxiety, which showed a higher stability of situational anxiety. By definition, situational anxiety persists while the trigger (in our case COVID-19) exists. As anxiety is maintained by overestimating threat (Abramowitz & Blakey, 2020), when this overestimation is highlighted in context, e.g., in media, stability or a slower drop in situational anxiety is expected. Additionally, we examined the role of covariates (individual level and school level) in initial levels and in the rate of change in general anxiety and COVID-19 anxiety.

Individual-Level influences on anxiety and COVID-19 anxiety

As expected, initial levels of anxiety and COVID-19 anxiety vary between genders. In line with research (Ertanir et al., 2021; Hawes et al., 2022; Wang et al., 2020), females report higher levels of both types of anxiety, making them more at risk of mental health difficulties. There is also a significant effect of gender on the rate of change in COVID-19 anxiety (but not for general anxiety). Males show a more stable trajectory from the beginning to the end of the school year, while females report a steeper decrease from the beginning to the middle of the school year before it rises again at the end of the school year. The findings demonstrate more vulnerability to situational changes reflected in specific COVID-19 anxiety and not in general anxiety as well as more vulnerability to situational cues for anxiety for females. Similarly, Tolin and Foa (2008) reported that females were more vulnerable after exposure to trauma and stress. Gender is a good example of how trajectories differ across distinct groups, highlighting the significance in incorporating various covariates when investigating changes during the COVID-19-specific school year.

School-level influences on anxiety and COVID-19 anxiety

As we have analysed the general anxiety and COVID-19 anxiety trajectories in the school setting, we have included school-associated covariates, that is, school level, academic achievement and school belongingness. We found significant differences in the initial levels of both types of anxiety at the school level, with upper secondary students reporting higher levels of anxiety and COVID-19 anxiety than lower secondary students. As anxiety increases through adolescence due to the burst in cognitive development feeding the cognitive dimension of anxiety, i.e., worries (Silverman & Treffers, 2022), these initial differences are expected. Similarly, Wang et al. (2020) reported that students in senior years were more prone to higher anxiety levels. We did not find differences in the rate of change among upper and lower secondary students.

We did, however, find a significant effect of academic achievement on the rate of change in general anxiety, although not in COVID-19 anxiety, and a significant effect of academic achievement on initial differences in COVID-19 anxiety. More specifically, general anxiety decreased steadily from the beginning to the end of the school year for low achievers, while the anxiety of high achievers actually increased from the beginning to the middle of the school year and then decreased at the end of the school year. Research shows that anxiety is negatively associated with academic achievement in both clinical and non-clinical samples and in different age groups, e.g., at both the primary and secondary levels of education (Mazzone et al., 2007). Studies have revealed that the influence can run in both directions. Decreased academic achievement leads to increased anxiety, and in turn, this increased anxiety results in reduced achievement due to anxiety affecting thinking and learning processes (Prevatt et al., 2010). In our case, the teaching and learning process was at that time moved to the online setting, which called for adaptation in terms of teaching as well as in learning. Although we expected high-achieving students to adapt more quickly to online schooling and to report less anxiety as well as a flatter rate of change, this was not the case in our sample. We can assume that high-achieving students have more school-related concerns as the association between such concerns and anxiety was also reported in the study by Hawes et al. (2022). With COVID-19, the differences were significant at the initial level, with high-achieving students reporting greater

COVID-19 anxiety than low-achieving ones, which is not in line with literature showing a negative association between anxiety and achievement. The findings also reflect the specificity of COVID-19 anxiety in regard to academic achievement. There were no significant differences in the rate of change in COVID-19 anxiety between high- and low-achieving students.

School belongingness at each measurement point was negatively associated with general anxiety and positively with COVID-19 anxiety. The students that reported being more connected to their school reported lower anxiety and higher COVID-19 anxiety. The mixed findings indicate the importance of looking into the complexities of anxiety on both a more general and more specific level. Overall, we see that being connected to the school and peers (the scale used mostly detects positive connections with peers) is a protective factor keeping anxiety levels low. At the same time, this same connection to peers is associated with higher COVID-19 anxiety. It could be the case that the stress and uncertainties associated with the pandemic worried in particular those who are more connected to their peers and schools. More specifically, those who were more positively connected to their school were also more anxious about losing the context to which they were connected. And on the other hand, it could be that those who were not connected to their school were not stressed by the school closure as much.

Implications

Based on our findings, we would not support targeted prevention and intervention for females, high-achieving students or upper secondary students as anxiety has negative effects on the well-being of all subgroups. COVID-19 and its restrictions have triggered a lot of anxiety, the decrease of which over time was dependent on the level of initial COVID-19 anxiety. In the adolescents' population, the health threat of COVID-19 was not present as much as in the older population, therefore we can assume that the core of the COVID-19 anxiety was not related to health but more to the restrictions in place. In future, when facing similar situations, we would advise tailoring such restrictions as well as public health messages in line with the actual health threat and thus avoiding the negative consequences of specific situational anxieties such as the worry resulting from COVID-19. As there is evidence of the beneficial role of social and emotional competency support in the prevention of anxiety across age groups (e.g., Kozina, 2020; Kozina et al., 2021), we would support those types of interventions. Our findings also support the importance of social support and school belongingness; therefore, we would support paying extra attention to classroom and school climate, especially in times of isolation and online schooling, as well as immediately after.

Limitations

The study brings important insights regarding the changes in general anxiety and COVID-19 anxiety in a very specific COVID-19 school year. While our findings also provide valuable insights into the individual- and school-level factors influencing anxiety and COVID-19 anxiety, it is crucial to emphasize that the model fit for general anxiety is suboptimal, which raises concerns regarding the validity of the findings. Even though the fixed cut-off criteria for model fit as used in our study (Hu & Bentler, 1999) are criticized, especially in structural equation models and latent growth curve models (Greiff & Heene, 2017; McNeish & Wolf, 2023), they are currently widely used, including in our study. It is, however, important to explore potential reasons for the comparatively poorer fit observed in the case of general anxiety, as opposed to COVID-19 anxiety. The covariates used are the same in both cases. We do however see a difference in the association between belongingness and general anxiety (negative), and with COVID-19 anxiety (positive). This discrepancy may serve as a potential hypothesis to explain the poorer fit observed in the case of general anxiety. One potential explanation for this observation is that due to its more encompassing nature, general anxiety may demonstrate a consistent correlation with belongingness across all three time points, rather than solely at the specific moment of measurement. In other words, the relationship between general

anxiety and belongingness may extend beyond an immediate temporal context. In contrast, situational COVID-19 anxiety may be more closely linked to belongingness specifically at the time of measurement, and the link between situational COVID-19 anxiety and belongingness could be more immediate and context-dependent, primarily manifesting at the specific moment of measurement.

Additionally, while the fact that this was a COVID-19 school year is an added value of the study, it is at the same time a limitation, as it is not possible to draw any conclusions or compare the findings to normative non-pandemic years. The school context and its complexities change significantly throughout the school year, and these changes could influence the anxiety levels as well as additional stressors imposed on adolescents during the COVID-19 pandemic. Our findings reflect both and cannot be separated from one another. In the future, a repetition of the study in a non-pandemic year would be extremely valuable. In addition to contextual complexities and limitations in terms of generalizability, there are additional methodological limitations. For instance, using list-wise deletion in treating missing values and keeping in the study only participants that have taken part in all three time periods provides us, on the one hand, with a clearer data set and at the same time can jeopardize the representativeness of the used data set for the overall sample. We did however run additional analyses to make sure that the data set we have used does not significantly differ from the complete data set. As relatively small percentages of missing values were present at all three measurement points, we believe the data set used is a good representative of the sample. Nevertheless, the study does provide insights into differences between general anxiety and COVID-19 anxiety in regard to school-related covariates that trigger our research interest in planning future research in this direction.

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