

# PREVALENCE OF DISTRESS AND DEPRESSION AND RELATED HEALTH AND BEHAVIOURAL FACTORS IN THE STUDENT POPULATION OF LATVIA DURING THE COVID-19 OUTBREAK

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*The COVID-19 pandemic, which has spread across the world, has made an impact on every student's ordinary life and mental health, from studying conditions, internship, employment to freedom of movement. This was a cross-sectional study where Latvian university and college students were asked to fill the self-report online questionnaire developed as part of an international study. The objective of the study was to investigate the effects of COVID-19 pandemic and investigate clinical depression, distress and identify the predicting factors. Depression and distress were determined using the Center for Epidemiologic Studies Depression Scale (CES-D) with a previously developed algorithm and cut-off scores. The statistical analysis included the Pearson's chi-square test and binomial logistic regression. The study included 1047 students. The prevalence of distress was 18% (n = 188) and prevalence of depression was 33.8% (n = 354). Depression was more common among women — 35.9 % (n = 298). Risk factors for depression were poor quality of sleep (OR = 8.31), unemployment (OR = 1.42), excessive internet usage (OR = 7.17), thoughts about death (OR = 12.14), and suicidal behaviour (OR = 4.99). Physical activities operated as a protective measure to prevent depression. This study potentially could help to develop a plan in the future for dealing with psychological support for the student population.*

**Keywords:** *mental health, pandemic, lockdown, anxiety, predictors.*

## INTRODUCTION

The COVID-19 pandemic, which swept rapidly across the world, has made an impact on every student's ordinary life,

from study conditions, internship, and employment to freedom of movement. These changes are all stressful and students had to manage these concerns by themselves. Young people are a high-risk group for mental illness

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(Huang *et al.*, 2020). The COVID-19 pandemic had a crucial impact on mental and physical health of populations (Holmes *et al.*, 2020).

Recent research has proved that younger people below the age of 35 years and students (Solomou *et al.*, 2020) have significantly higher prevalence of depression in comparison to older people (Guo *et al.*, 2020; Huang *et al.*, 2020; Solomou *et al.*, 2020). One study demonstrated that females are a high-risk group for developing depression symptoms. (Solomou *et al.*, 2020). Another study on the general population emphasised that females compared to males in a pandemic are affected by depression to a far greater extent (Santomauro *et al.*, 2021). A study done in China indicated that living alone was a risk factor for depressive symptoms in the public society (Guo *et al.*, 2020).

A previous study during the COVID-19 pandemic on distress in the general population reported relatively high rates of psychological distress — 34.43% to 38% (Xiong *et al.*, 2020). The pandemic caused a high level of distress (Wang *et al.*, 2020). Female and young people between 18 and 30 years were more likely to develop distress (Qiu *et al.*, 2020). However, there is insufficient information about predicting factors for distress.

Research done on university students showed that sedentary behaviour elevated depression (Lee *et al.*, 2019). A rapid systematic review found evidence for lesser symptoms of depression during the COVID-19 pandemic if physical activity is done regularly with elevated volume and frequency (Wolf *et al.*, 2021).

Healthy eating has a major part in prevention and reducing the speed of progression of depression symptoms (Kris-Etherton *et al.*, 2021). Unhealthy eating was found to be associated with depression in a population of university students (Ramón-Arбуés *et al.*, 2019).

It is known that sleep affects depression, and disturbance of sleep results in elevation of depression (Pandi-Perumal *et al.*, 2020). A study done in an adolescent population showed that sleep deprivation elevated the risk of depressive symptoms by 25–38% (Roberts *et al.*, 2014). A study done in Italy during the COVID-19 pandemic reported that poorer quality of sleep is associated with higher levels of depression (Cellini *et al.*, 2020).

Habits of using the Internet have been associated with higher odds for depressive symptoms (Sayeed *et al.*, 2021). One study showed a connection between depression and increased time spent on the Internet during COVID-19 lockdown in Italy (Gualano *et al.*, 2020).

A study on the general population in Greece during the COVID-19 pandemic showed that suicidal thoughts increased by 10.40% and one of the risk factors for depression was previous history of suicidal attempts (Fountoulakis *et al.*, 2021). Another study done in Latvia in the general population indicated increase of suicidal thoughts in 13.30%

and increase of suicidal attempts by up to 27.05% (Vrublevska *et al.*, 2021)

This study aims to investigate the effects of the COVID-19 pandemic on distress and depression and to identify the predicting factors for depression and distress of university and college students of Latvia during the state of emergency from December 2020 to February 2021.

## MATERIALS AND METHODS

**Data collection.** The study is based on a questionnaire developed as a part of an international study involving collaboration of the Aristotle University of Thessaloniki, Greece with the World Psychiatric Association (Patsali *et al.*, 2020). Eleven countries (Bulgaria, Croatia, Georgia, Greece, Hungary, India, Latvia, Lithuania, Malaysia, Nigeria, and Russia) participated in the study. In this cross-sectional study, university and college students were asked to complete the self-report questionnaire online electronically on a voluntary basis. The survey was translated from English into Latvian. The translation was then examined by a Latvian speaking focus group for verification. Data was collected anonymously. The survey was conducted from 8 December, 2020 to 23 February 2021 during the first COVID-19 outbreak in Latvia. The questionnaire was modified according to the state of the emergency period. Both university and college students participated in the study, the main fields of study of the students included in this study included medicine, computer sciences/Informatics, veterinary medicine, economics, which ensured that the sample was representative.

Students were classified into three groups depending on their studies. Group A included health and biological sciences, group B included technical sciences and group C — arts, literature, education and related sciences (Patsali *et al.*, 2020).

**Survey. Sociodemographic determinants.** An objective of the study was to determine the association between distress, depression, and sociodemographic characteristics of participants — sex, age, urbanisation, family status, education and employment during lockdown. Family status included single, married or in a civil partnership and people with other marital status (divorced or estranged, living with someone without an official relationship, widower, other).

**Distress, depression.** The Center for Epidemiologic Studies Depression Scale (CES-D) was used to measure presence of distress and depressive symptoms. The cut-off score 23/24 was used for the CES-D. A previously developed algorithm (Fountoulakis *et al.*, 2001) was used to identify cases of depression. Respondents who met the conditions for both of the following were categorised as having depression — equation value above 9.03 and cut-off score 23/24 on the CES-D. If respondents met only one criteria (equation value above 9.03 or cut-off score 23/24 on the CES-D), they were categorised as having distress. The internal consistency of

the CES-D in our study was previously determined (Vrublevska *et al.*, 2021), and internal consistency was good (Cronbach's  $\alpha = 0.84$ ).

**Health-related characteristics.** Questions about physical activity, nutrition, and quality of sleep were included in the analysis of health-related characteristics.

Opinion about physical activities were acquired by the questions, "Have you increased the frequency and intensity of your physical workout during this epidemic and lockdown? Do you consider that exercise is important during this epidemic? Does exercise help you in the prevention of anxiety?" The responses were answered on a five-point scale (not at all, a little, moderately, much, very much). Change of physical activity because of the pandemic was assessed by the question: "How much has your physical activity been affected by this epidemic of COVID-19?" The responses were answered on a five-point scale (it decreased much, it decreased a little, neither decreased, nor increased, it increased a little, it increased much).

Eating habits during the lockdown were measured by the question, "Did you notice the need to eat larger amounts of food or eat more often?", which was rated using a five-level scale (I eat much less than I used to, I eat a bit less than I used to, neither more nor less, I eat a bit more than I used to, I eat much more than I used to). Eating habits were assessed by the statement, "Please mark the answer that best represents you during this period." The responses were answered on a three-point scale (I eat in a healthier way, my eating habits and preferences have not changed, I eat in a more unhealthy way). Change of body weight was assessed by the statement, "Please mark the answer that best represents you during this period (you can choose more than one answer)." The responses were answered on a five-point scale (my body weight has significantly decreased (more than 2–3 kilos), my body weight has slightly decreased (less than 2 kilos lost), my body weight is stable, my body weight has slightly increased (less than 2 kilos put), my body weight has significantly increased (more than 2–3 kilos)).

We evaluated the quality of sleep using the statement: "The quality of my sleep has changed recently." The responses were answered on a five-point scale (It is – much worse, a little bit worse, the same (neither worse nor better), a little better, much better). Changes in the sleep quality of participants were assessed by statements, "I take sleeping pills to help me sleep at night. I am having dreams in which I feel trapped, over the last 3 weeks." The responses were answered on a five-point scale (rarely, some times, often, almost always).

**Internet usage.** Questions about the Internet usage habits were given to identify association between distress, depression and usage of the Internet. We evaluated Internet usage and habits using the statement: "Due to the epidemic conditions, the Internet takes up more of my time than usual." The answers were answered on a five-point scale (not at all,

a little, moderately, much, very much). Questions about Internet usage included, "How much do you use the social media while in isolation at home?" The responses were answered on a three-point scale (more than before, the same as before, less than before). A question related to Internet usage habits was: "Have you acquired Internet-related habits that you did not have before (for example: created a Facebook account, engaging in cybersex or gambling)?" The responses were in the form of "yes" or "no".

**Suicidality.** Risk Assessment of Suicidality Scale (RASS) (Fountoulakis *et al.*, 2012) was used to assess suicidality and behaviours of participants. Internal consistency was previously determined in a Latvian population study (Vrublevska *et al.*, 2021). The internal consistency of the RASS was good (Cronbach's  $\alpha = 0.93$ ).

**Statistical analysis.** Data were analysed using Microsoft Excel 2018 and SPSS Statistics. The Pearson's chi-square test was used to compare frequencies between the study groups. The predictors of distress and depression were identified using binomial logistic regression. For the binomial logistic regression analysis seven respondents were not included in the analysis because they did not specify their sex.

## RESULTS

The study included 1047 students, 828 females (79.08% aged  $21.71 \pm 0.09$ ), 212 males (20.25% aged  $21.67 \pm 0.18$ ), and seven participants who did not want to specify their sex (0.67% aged  $20.43 \pm 0.48$ ). Among the participants, the prevalence of distress was 18% ( $n = 188$ ) and the prevalence of depression was 33.8% ( $n = 354$ ).

Depression was more prevalent in those who had other family status (divorced or estranged, living with someone without an official relationship, widower, other) 46.3% ( $n = 63$ ) and unemployed 37.6% ( $n = 244$ ).

Distress was more prevalent in those who were in a relationship (married, living with someone — 19.24%,  $n = 81$ ) and unemployed — 19.37% ( $n = 111$ ).

Detailed data about the sample's sociodemographic characteristics is presented in Table 1.

Distress and depression prevalence was significantly higher for people whose physical activity decreased much because of the pandemic (35.2% vs. 44.2%, respectively), compared to those whose physical activity increased a little (24.8% vs. 32.8%, respectively). For respondents who ate more unhealthy, prevalence of distress was 42.2% ( $n = 65$ ) and of depression — 48.8% ( $n = 147$ ). The association between eating habit and distress/depression prevalence was statistically significant ( $p < 0.001$ ). Bad quality of sleep was a major risk factor for distress and depression. For respondents who claimed to have worse quality of sleep, prevalence of distress and depression (40.9% vs. 53.8%, respectively) was much higher than those who had better sleep (26.3% vs. 12.3%, respectively). Prevalence of distress and depression

Table 1. Socio-demographic characteristics of the sample (n = 1047)

Characteristics	All respondents % (n)	No distress/depression % (n)	Distress, % (n)	Depression, % (n)
Sex			<i>p</i> = 0.002	<i>p</i> < 0.001
Women	79.08 (828)	44.93 (372)	19.08 (158)	35.99 (298)
Men	20.25 (212)	62.74 (133)	13.21 (28)	24.06 (51)
Other	0.67 (7)	0 (0)	28.57 (2)	71.43 (5)
Urbanisation			<i>p</i> = 0.742	<i>p</i> = 0.221
Capital city	50.62 (530)	50.75 (269)	17.92 (95)	31.32 (166)
Other city or town	34.67 (363)	46.28 (168)	17.63 (64)	36.09 (131)
Rural area	14.71 (154)	44.16 (68)	18.83 (29)	37.01 (57)
Family status			<i>p</i> = 0.459	<i>p</i> < 0.001
Single	46.8 (490)	48.98 (240)	16.94 (83)	34.08 (167)
In a relationship (married, living with someone)	40.2 (421)	51.31 (216)	19.24 (81)	29.45 (124)
Other (divorced, widower, other)	12.99 (136)	36.03 (49)	17.65 (24)	46.32 (63)
People living in house			<i>p</i> = 0.251	<i>p</i> = 0.053
One	8.5 (89)	46.07 (41)	10.11 (9)	43.82 (39)
Two	34.48 (361)	51.25 (185)	18.28 (66)	30.47 (110)
Three and more	57.02 (597)	46.73 (279)	18.93 (113)	34.34 (205)
Field of studies			<i>p</i> = 0.732	<i>p</i> = 0.042
Group A	38.11(399)	49.62 (198)	17.04 (68)	33.33 (133)
Group B	21.97 (230)	51.30 (118)	20.87 (48)	27.83 (64)
Group C	39.93 (418)	45.22 (189)	17.22 (72)	37.56 (157)
Employment status			<i>p</i> = 0.020	<i>p</i> = 0.008
Working	45.27 (474)	54.22 (257)	16.24 (77)	29.54 (140)
Not working	54.73 (573)	43.28 (248)	19.37 (111)	37.35 (214)
Work during lockdown			<i>p</i> = 0.054	<i>p</i> < 0.001
Yes	38.0 (398)	55.53 (221)	16.83 (67)	27.64 (110)
No	61.99 (649)	43.76 (284)	18.64 (121)	37.6 (244)

was also higher in those sometimes and often had dreams in which they felt trapped (41.3% vs. 49.5%, respectively) compared those who did not (21.1% vs. 23.8%), and this associations was statistically significant ( $p < 0.001$ ). In people who were spending too much time online, distress prevalence was 45.7% (n = 53) and depression was 53.4% (n = 133), compared to people who were spending a little more time online (17.1% vs 26.3%, respectively).

Among people whose tendency to think about death and/or suicide had increased a bit, prevalence of distress was 56.6% and prevalence of depression was 65.1%. Prevalence of distress and depression among people who had hurt themselves many times (61.8% vs. 64.2%, respectively) was much higher than those who had not (24.4% vs. 26.4%, respectively). For respondents who had once attempted suicide, prevalence of distress and depression was 38.1% vs. 65.6% compared to those who have never attempted suicide (26.7% vs. 30.7%, respectively).

Logistic regression revealed that statistically significant predictor variables for distress were sex (woman: OR = 2.02), unemployment (OR = 1.49), no work during lockdown (OR = 1.41), eating more unhealthy (OR = 1.79), change of sleep hours (OR = 5.87), worse sleep quality (OR = 1.94), dreams in which feeling trapped (OR = 2.62), new Internet-related habits (OR = 1.99), spending too much time online

(OR = 7.05), having felt that it's not worth living (very much, OR = 6.98), having hurt themselves many time (OR = 4.99), and increased tendency to think about death (OR = 8.21). Predictor factors for depression were sex (OR = 1.78), other marital status (OR = 2.07) unemployment (OR = 1.42), no work during lockdown (OR = 1.58), eating more unhealthy (OR = 2.37), change of sleep hours (OR = 8.18), worse sleep quality (OR = 8.31), taking sleep pills (OR = 3.39), dreams in which feeling trapped (OR = 3.14), new internet-related habits (OR = 1.87), spending too much time online (OR = 7.17), having felt that it's not worth living (very much, OR = 13.89), having hurt themselves many times (OR = 4.99) and increased tendency to think about death (OR = 12.1). Specific protective factors were also identified. Data on predictor and protector factors are given in Table 2.

## DISCUSSION

This study investigated students' mental health, especially depression and distress and associated characteristics, during the first COVID-19 outbreak. We found that 18% (n = 188) of the participants suffered from distress and 33.8% (n = 354) had depression. Our results demonstrated that women were more likely to have distress and depression compared to men. Unemployed respondents had higher

Table 2. Logistic regression predicting distress and depression based on socio-demographic, health-related and thoughts about death, self-harm, suicidality characteristics (n = 1047)

	Distress				Depression			
	p	OR	95% CI		p	OR	95% CI	
			lower	upper			lower	upper
<b>SEX</b>								
female vs male	0.002	2.02	1.29	3.16	< 0.001	1.78	1.26	2.51
<b>MARITAL STATUS (reference category – married, in a relationship)</b>								
other	0.342	1.31	0.75	2.27	< 0.001	2.07	1.39	3.07
single	0.657	0.92	0.65	1.32	0.136	1.24	0.94	
<b>EMPLOYMENT</b>								
unemployed vs employed	0.02	1.49	1.06	2.1	0.008	1.42	1.1	1.84
<b>WORK DURING LOCKDOWN</b>								
no vs yes	0.054	1.41	0.99	1.99	< 0.001	1.58	1.2	2.07
<b>FIELD OF STUDIES</b>								
group B vs group A	0.445	1.18	0.77	1.83	0.152	0.77	0.54	1.1
group C vs group A	0.599	1.11	0.75	1.63	0.207	1.2	0.9	1.6
<b>PHYSICAL ACTIVITY</b>								
Change of physical activity because of pandemic (reference category – decreased much)								
increased a little	0.045	0.61	0.37	0.99	0.009	0.62	0.43	0.89
didn't change	< 0.001	0.37	0.23	0.61	< 0.001	0.43	0.3	0.62
<b>NUTRITION</b>								
Eating larger amounts of food or more often (reference category – eating less)								
eating more	0.339	0.81	0.53	1.24	< 0.001	0.49	0.36	0.67
didn't change	.001	0.42	0.27	0.65	< 0.001	0.19	0.13	0.26
Eating habits during lockdown (reference category – healthier)								
not changed	0.08	0.66	0.41	1.05	0.75	0.94	0.64	1.38
more unhealthy	0.027	1.79	1.07	3	< 0.001	2.37	1.57	3.57
Change of body weight (reference category – decreased)								
didn't change	0.004	0.52	0.33	0.81	< 0.001	0.41	0.29	0.58
Increased	0.07	0.66	0.42	1.03	0.02	0.68	0.49	0.94
<b>SLEEP DURING THIS PERIOD</b>								
Change of sleep hours (reference category – almost never)								
sometimes	0.006	2.4	1.29	4.46	0.003	2.19	1.3	3.69
almost always	< 0.001	5.87	2.99	11.53	.001	8.18	4.86	13.79
Quality of sleep								
worse sleep vs better sleep	0.043	1.94	1.02	3.68	< 0.001	8.31	3.89	17.75
Taking sleep pills								
sometimes vs never	0.772	1.08	0.66	1.77	< 0.001	3.39	2.48	4.65
Dreams in which feeling trapped								
sometimes vs never	< 0.001	2.62	1.84	3.73	< 0.001	3.14	2.41	4.1
<b>INTERNET</b>								
New internet-related habits								
yes vs no	0.004	1.99	1.25	3.18	< 0.001	1.87	1.33	2.63
Spending more time online (reference category – not at all)								
moderly more	0.014	2.77	1.23	6.24	0.027	2.15	1.09	4.23
much more	0.001	3.87	1.75	8.56	0.001	3.27	1.7	6.3
too much	0.001	7.05	3.11	15.98	0.001	7.17	3.71	13.4
Use of social media (reference category – less than before)								
the same as before	0.81	0.92	0.46	1.85	0.009	0.52	0.32	0.85
more than before	0.099	1.77	0.9	3.5	0.868	1.04	0.66	1.65



Table 2 (Continued).

	Distress				Depression			
	<i>p</i>	OR	95% CI		<i>p</i>	OR	95% CI	
			lower	upper			lower	upper
<b>THOUGHTS ABOUT DEATH</b>								
Are you afraid that you are going to die? (reference category – not all)								
A little bit	0.077	1.41	0.96	2.07	0.001	2.26	1.7	2.3
Much	0.331	1.54	0.64	3.69	0.001	3.4	1.93	6
Very much	-	-	-	-	0.001	5.23	2.05	13.32
Do you ever think that it would be better if you were dead? (reference category – not at all)								
A little bit	< 0.001	2.17	1.5	3.15	< 0.001	3.26	2.340	4.55
Much	< 0.001	5.76	2.98	11.15	< 0.001	9.99	6.300	15.82
Very much	< 0.001	5.39	2.31	12.58	< 0.001	13.89	8.050	23.96
Have you ever felt that it's not worth living? (reference category – not at all)								
A little bit	0.004	1.72	1.18	2.5	< 0.001	3.01	2.17	4.42
Much	< 0.001	4.04	2.21	7.36	< 0.001	9.79	6.24	15.36
Very much	< 0.001	6.98	2.44	19.96	< 0.001	21.42	11.4	40.26
Do you often think of committing suicide if you have the chance? (reference category – not at all)								
A little bit	< 0.001	4.28	2.44	7.49	< 0.001	4.36	3.01	6.3
Do you make plans concerning the method to use in order to end your life? (reference category – not at all)								
A little bit	< 0.001	6.51	3.53	11.98	< 0.001	4.87	3.35	7.07
Change of tendency to think about death and/or suicide (reference category – very much decreased)								
Decreased a bit	0.497	1.53	0.45	5.26	0.028	3.41	1.14	0.22
Neither increased nor decreased	0.999	1.001	0.42	2.38	0.222	1.74	0.72	4.25
Increased a bit	0.005	4.27	1.57	11.71	< 0.001	9.34	3.66	23.86
Very much increased	0.004	8.21	1.96	34.51	< 0.001	12.14	4.14	35.58
Have you ever hurt yourself in any way deliberately, during your whole life so far? (reference category – never)								
Once	0.347	1.39	0.7	2.74	< 0.001	2.85	1.81	4.49
2-3 times	0.313	1.38	0.74	2.56	< 0.001	2.52	1.64	3.85
Many times	.001	4.99	2.44	10.25	< 0.001	4.99	3.19	7.82
Have you ever attempted suicide, during your whole life so far? (reference category – never)								
Once	0.253	1.69	0.69	4.14	< 0.001	2.49	2.49	7.42
2-3 times	0.717	1.37	0.25	7.55	0.011	3.76	1.36	10.44

OR, odds ratio

Group A, health and biological sciences

Group B, technical sciences

Group C, arts, literature, education and related sciences

prevalence of distress (OR = 1.49) and depression (OR = 1.42). We found that over one-third of university students in Latvia had depression, indicating that there could be a greater psychological impact on the public caused by uncertainty of the pandemic progression. Compared with depression rates in the general population of Latvia (Vrublevska *et al.*, 2021), the depression rates are higher within the studied student population. The depression prevalence was high, although it was close to the prevalence of 30.6% in the global student population (Ibrahim *et al.*, 2013). The Greek student population study revealed that during lockdown, distress was present in 13.46% respondents and depression was present in 12.43% (Patsali *et al.*, 2020). This shows much higher distress and depression rates among the population of Latvian students.

In another study of a student population, poor physical activities and increased sedentary life style were associated with depressive symptoms and anxiety during the COVID-19 pandemic (Huckins *et al.*, 2020). Other studies found that increased sedentary lifestyle and increased phone usage were associated with depression and anxiety a college student population (Huckins *et al.*, 2019). Our results showed that physical activity was a protective measure to prevent depression (OR = 0.62). These results indicate that people should dedicate more of their time to physical activities with the purpose of preventing depression and distress.

COVID-19 and stress or depression have an effect on the quality of life, and suitable nutrition is a critical component

in strengthening the immune system and simultaneously improving mental health. The general public's stress and anxiety promote eating unhealthy food, and this appeared as an alternative to reduce the chaos and unpleasant mood states in the COVID-19 pandemic (Shabbir *et al.*, 2022). In contrast to that study, which was conducted in Pakistan, we found that eating unhealthy food promoted distress (OR = 1.79) and depression (OR = 2.37), compared to respondents who eat healthier.

Research has shown that poor quality of sleep affects depression and distress in the general population (Huang *et al.*, 2020). As our data analysis showed, people who claimed to have worse quality of sleep had higher odds to develop distress (OR = 1.94) and depression (OR = 8.31). One of the explanations might be that young people are more affected by economic changes and financial problems, which could lead to increased stress affecting quality of sleep. Overall, one of the risk factors for developing distress and depression is poor quality of sleep. In addition, our study showed no statistical significance between people who were taking sleeping pills and distress (OR = 1.08). We consider that this finding requires further research. According to a study in the general population, rate of bad dreams and nightmares increases during periods of stress (Schredl *et al.*, 2019). A study conducted in Italy found that anxiety and depressive symptoms are positively associated with nightmares (Scarpelli *et al.*, 2021). Similarly, our study found that people who had dreams in which they felt trapped had higher odds to develop depression (OR = 3.14) and distress (OR = 2.62).

A study conducted in Bangladesh reported an association between Internet usage and depression in the student population (Sayeed *et al.*, 2021). We found that excessive Internet usage was a risk factor for development of distress and depression. Our results are similar to those reported in Bangladesh, as in our study, respondents who were spending too much time online had higher odds to develop distress (OR = 7.05) and depression (OR = 7.17).

According to WHO data from 2019, the age-standardised average suicide rate in Europe was 10.5 per 100 000 — in Latvia the rate was 16.1 (per 100 000 population) (World Health Organization, 2021). Previous literature addressed suicide as a general public health issue already before the pandemic, but which became worse because of the stress, isolation and uncertainty (Courtet *et al.*, 2021). The data analysis revealed that respondents with increased tendency to think about death and suicide during the pandemic had higher rate of distress (OR = 8.21) and depression (OR = 12.14). History of self-harm or suicidality was a risk factor for the development of distress (OR = 4.99) and depression (OR = 4.99). Our study found that respondents who had felt that it is not worth living had a significantly higher chance to develop depression (OR = 21.42).

One of the strengths of our study was the large number of persons who completed the questionnaire. Also, there were no previous published similar studies about the Latvian stu-

dent population. Compared to other studies done on student populations, many aspects of health and behaviour were identified in our study. This study did, however, have some limitations. The major limitation was that the data were obtained anonymously, online, through self-selection of the responders and thus the respondent group did not represent the whole student population in Latvia. Another important limitation that may have influenced the results is that the opinion of the respondents who did not fill in the questionnaire may differ from those who did. Also, the questionnaire was translated only into Latvian. Additionally, the study had under-representation of male respondents. The scales used in the study were not specifically validated for use in the student population, but this study was conducted as part of an international study that required adherence to the given scales. However, an advanced algorithm was used for the diagnosis of depression. The lack of published baseline data concerning student mental health before the pandemic is also a problem. Long-term impact of COVID-19 on mental health of students needs further study.

This study potentially could help to develop a plan in the future for dealing with psychological support for students. The following measures could be implemented based on our study results: raise awareness about distress and depression and coping strategies to the target population through the media, general practitioners, universities, and students' associations. There is also a need to empower collaboration between specialists like psychiatrists, psychotherapists, psychologists and student unions and policy developers to elaborate implementation of policy and strategy to improve psychological strength of the Latvian student population.

## CONCLUSION

This study showed the link between various factors and distress and depression during the COVID-19 pandemic in the student population in Latvia. The prevalence of distress among participants was 18%. The prevalence of depression among participants was 33.8%. Women had 2.02 times higher odds to develop distress and 1.78 times higher odds to develop depression. Increase in physical activities is a protective measure to combat distress and depression. Eating more unhealthy food, having worse quality of sleep, having new Internet-related habits, spending too much time online, having hurt themselves many times, feeling that it is not worth living, and tendency to think about death or suicide are associated with higher odds for distress and depression.

## ETHICS

The protocol of this study was approved by the Research Ethics Committee of Rīga Stradiņš University, Rīga, Latvia.

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## DISTRESA UN KLĪNISKĀS DEPRESIJAS IZPLATĪBA UN SAISTĪBA AR VESELĪBAS UN UZVEDĪBAS FAKTORIEM LATVIJAS STUDENTU POPULĀCIJĀ COVID-19 PANDĒMIJAS LAIKĀ

Covid-19 pandēmija, kas izplatījusi visā pasaulē, ir ietekmējusi ikvienu studenta ikdienu un mentālo veselību, sākot no studiju apstākļiem, prakses iespējām, darba iespējām līdz pārvietošanās brīvībai. Šajā šķērsgrūzuma pētījumā universitāšu un koledžu studentiem tika lūgts tiešsaistē aizpildīt pašnovērtējuma anketu, kas izstrādāta starptautiska pētījuma ietvaros. Pētījuma mērķis bija izpētīt Covid-19 pandēmijas ietekmi uz studentu populāciju un izpētīt klīniskās depresijas izplatību, distressu un noteikt ar to saistītos faktorus. Statistiskā analīze tika veikta, izmantojot *Microsoft Excel*, *SPSS* (Pirsona hī kvadrāta tests, loģistikā regresija). Depresija un distress tika noteikts ar iepriekš izstrādātu algoritmu un kopējo punktu summas rādītājiem. Pētījumā piedalījās 1047 studenti. Distresa izplatība bija 18% (n = 188) un depresijas izplatība bija 33,8% (n = 354). Tika secināts, ka depresija ir biežāk sastopama sieviešu vidū 35,9% (n = 298). Pētījuma dati pierāda, ka galvenie depresijas izplatības riska faktori bija slikta miega kvalitāte (OR = 8,31), bezdarbs (OR = 1,42), pārmērīga interneta lietošana (OR = 7,17), domas par nāvi (OR = 12,14) un suicidāla uzvedība (OR = 4,99). Fiziskās aktivitātes darbojās kā protektīvs faktors, lai novērstu depresijas attīstību. Šis pētījums varētu kalpot par pamatu psiholoģiska atbalsta rekomendāciju izstrādei studentu populācijā.