

Fear of COVID-19 and future anxiety among Polish university students during a pandemic

BACKGROUND

The pandemic poses a threat to human health and life, and anxiety is the most common psychological problem occurring during the COVID-19 pandemic. The aim of the study was to establish the differences in the fear of COVID-19 infection and the future anxiety experienced by students during the pandemic by gender, field of study, place of study and paid employment, and their relationships to psychological well-being.

PARTICIPANTS AND PROCEDURE

The study involved 1294 university students aged 18-30. The Future Anxiety Scale and short version of the Psychological General Well-Being Index were used. In addition, students stated whether they were concerned about the possibility of contracting the coronavirus and falling ill with COVID-19.

RESULTS

One-third of respondents stated that they felt fear of contracting the coronavirus. Women experienced a signifi-

cantly stronger fear of COVID-19 and future anxiety than men. The observed interaction effects show that female students of medical faculties experienced a higher fear of COVID-19 than women studying fields of study related to physical activity and working students experienced a slightly higher future anxiety. A positive, but weak correlation between fear of COVID-19 and future anxiety was found. Psychological well-being correlated poorly with fear of COVID-19 and moderately with future anxiety.

CONCLUSIONS

Because future anxiety was stronger in women, medical students, some master's students and working people, preventive measures should be taken to prevent excessive anxiety and to promote mental health in these groups.

KEY WORDS

worries about future; fear of infection; psychological well-being; college students

ORGANIZATION – 1: Faculty of Rehabilitation, Jozef Pilsudski University of Physical Education, Warsaw, Poland ·

2: Faculty of Physical Education and Health in Biala Podlaska, Jozef Pilsudski University of Physical Education in Warsaw, Poland

AUTHORS' CONTRIBUTIONS – A: Study design · B: Data collection · C: Statistical analysis · D: Data interpretation · E: Manuscript preparation · F: Literature search · G: Funds collection

CORRESPONDING AUTHOR – Prof. Monika Guskowska, Faculty of Rehabilitation, Jozef Pilsudski University of Physical Education, 34 Marymoncka Str., 00-968 Warsaw, Poland, e-mail: monika.guskowska@awf.edu.pl

TO CITE THIS ARTICLE – Guskowska, M., & Bodasińska, A. (2023). Fear of COVID-19 and future anxiety among Polish university students during a pandemic. *Health Psychology Report*, 11(3), 252–261. <https://doi.org/10.5114/hpr/165874>

RECEIVED 26.01.2023 · REVIEWED 27.02.2023 · ACCEPTED 03.05.2023 · ONLINE PUBLICATION 26.06.2023

BACKGROUND

The COVID-19 pandemic is a powerful stressor with many negative mental health consequences (Liu et al., 2020; Satıcı et al., 2022). The student population is particularly vulnerable to mental health problems (Auerbach et al., 2016). The results of many studies conducted around the world indicate high rates of perceived stress, deterioration of mood, and even clinical depression and anxiety in this group (Asanov et al., 2021; De Oliveira Araújo et al., 2020; Odriozola-González et al., 2020). Polish students also experience these problems (Debowska et al., 2022; Szczepańska & Pietrzyka, 2023). During the COVID-19 pandemic, students were exposed to stress resulting from a change in the form of studying (classes conducted entirely or partially remotely) and the method of verifying knowledge (online exams), difficult access to knowledge sources (closed libraries), limited social contacts, and limited or loss of employment opportunities (Hoover, 2020; McElroy et al., 2020; Prasath et al., 2021).

The pandemic poses a threat to one's own or relatives' health and life and other important values such as material security. Emotions of fear and anxiety arise when important values are threatened. Anxiety is the most common psychological problem occurring during the COVID-19 pandemic (APA, 2020). In general, anxiety is defined as an unpleasant feeling of danger and worried thoughts without a clearly defined source. It is subjectively experienced as negative tension, is associated with physiological changes and leads to avoidance behaviors (Ohman, 2000).

Future anxiety can most simply be described as the kind of anxiety that concerns the future in general (Zaleski, 1996). Each type of anxiety relates in some way to the future, because it is related to anticipation of threat or to possible danger. However, future anxiety refers to a distant rather than proximate perspective. A person who experiences future anxiety is preoccupied with, and worries about possible or anticipated unfavorable changes in the future (Zaleski 1996, 2018). Future anxiety is more cognitive than emotional, because the person is aware of his/her own worries and fears. Concerns may relate to the anticipation of various scenarios, such as loss of health, the occurrence of a natural disaster, or a global crisis. During the COVID-19 pandemic, future anxiety may be expressed as concerns about the global consequences of the pandemic in the form of a collapse of the economy, and in the individual dimension – a deterioration in the quality of life, the loss of one's job and of the possibility to pursue important life plans.

The intensity of future anxiety depends on cognitive factors such as subjective importance of the anticipated event and estimated probability of its occurrence, as well as some personality traits such as self-efficacy (Zaleski, 2018), hope (Tucholska et al.,

2022), and resilience (Paredes et al., 2021). Thus, it can be expected that people who differ in terms of their personality traits will experience future anxiety at different levels.

When faced with a defined, specific threat, fear arises (Ohman, 2000). This is the case with the fear of becoming infected with the coronavirus and contracting COVID-19. This fear leads to behaviors aimed at combating or avoiding a threatening factor, such as wearing masks, maintaining social distance, avoiding large groups of people, and vaccinating. The results of the meta-analysis by Luo et al. (2021) indicate that fear of COVID-19 during the first wave of the pandemic was the lowest among college students, but its impact on the psychological well-being of this group should not be underestimated. Research shows that fear of COVID-19 depended on factors such as alcohol or drug coping, negative religious coping, extreme hopelessness, and passive suicidal ideation (Lee et al., 2020) and resilience (Yıldırım & Güler, 2021).

Gender differences in future anxiety and fear of COVID-19 can also be expected. Women are generally more prone to experiencing fear and anxiety and suffer from anxiety disorders more often (APA, 2013). This is confirmed by studies conducted during the COVID-19 pandemic (Lee et al., 2020; Luo et al., 2021).

In the student population, fear of COVID-19 and future anxiety can be expected to differ depending on the level and field of study. Master's students, usually on the threshold of an independent life in economic terms or already independent, may be more afraid of changes in the economic situation of the country or problems with finding or keeping a job due to a pandemic, which will be manifested in a higher level of future anxiety. Bachelor's students, mostly economically dependent on their parents, may be less concerned about these possible changes. So we expect a higher level of future anxiety in master's students, especially those who are already working.

Previous studies on general anxiety during the first wave of the COVID-19 pandemic are inconclusive. Russian university students at bachelor's level were more afraid of COVID-19 than graduates (Reznik et al., 2021). In Spain, the indices of anxiety were significantly higher in students at bachelor's level (Odriozola-Gonzales et al., 2020). However, no differences were found in the severity of anxiety and stress between bachelor's and master's students in China (Wang & Zhao, 2020).

Medical faculties (physiotherapy, nursing, occupational therapy) students may experience a greater fear of coronavirus, because during clinical classes and internships usually held in medical facilities, they are actually more at risk of contracting COVID-19. The highest level of fear of COVID-19 was found in hospital staff (Luo et al., 2021).

According to Zaleski et al. (2019), future anxiety is correlated with a fatalistic view of the present

and exaggerating present and future threats. People experiencing strong future anxiety related to the pandemic are likely to experience stronger fear of COVID-19 because they probably spend a tremendous amount of time thinking about the pandemic. It can be expected that severe future anxiety results in estimating the probability of developing the disease as very high and perceiving the consequences of the disease as dangerous to health and even life. We expect a strong correlation between these variables. The previous study results demonstrated that coronavirus anxiety had a significant effect on fear of COVID-19 in Turkish health workers (Yıldırım & Güler, 2021). Salehi et al. (2020) found that higher fear of COVID-19 is associated with higher coronavirus anxiety, which in turn leads to mental health problems.

As shown by the results of previous studies, future anxiety and dysfunctional fear of COVID-19 are negatively correlated with psychological well-being (Lee et al., 2021). Individuals with high levels of future anxiety and fear of COVID-19 tend to suffer from various psychological difficulties and clinically significant disturbances (Lee, 2020; Lee et al., 2020, 2021; Skalski et al., 2020). We expect these relationships to be confirmed in our study.

The aim of the study was to establish the differences in the fear of COVID-19 infection and the fu-

ture anxiety experienced by university students during the pandemic by gender, field of study, place of study and paid employment, and their relationships to psychological well-being during a pandemic.

PARTICIPANTS AND PROCEDURE

PARTICIPANTS

An exploratory study was performed using a cross-sectional research design in November 2020, during the second wave of the COVID-19 pandemic when the level of quarantine restrictions was high. The study involved 1294 students at the Polish university of physical education, which accounts for about one-third of all current students, aged 18 to 30 years ($M = 20.83 \pm 1.97$), studying full-time in the capital city and in a branch in a small city of approximately 57,000 inhabitants, in the following university majors: physiotherapy ($n = 421$), nursing ($n = 88$), occupational therapy ($n = 80$), physical education ($n = 375$), tourism and recreation ($n = 188$), sport ($n = 142$). In statistical analyses, we distinguished two fields of study groups: medical faculties and faculties related to physical activity (PA).

Apart from a short period of complete lockdown at the beginning of the COVID-19 pandemic, students of all faculties studied in a mixed mode – theoretical classes were conducted remotely, and practical classes in contact (at medical fields – clinical classes, at PA fields – sports and PA classes).

The proportion of women and men differed significantly depending on the level of study ($\chi^2 = 5.75$, $p = .017$) and field of study ($\chi^2 = 38.72$, $p < .001$). The participants' demographic and academic characteristics are presented in Table 1.

PROCEDURE

The research was conducted using an online anonymous survey including psychological questionnaires. Basic personal data were also collected. The approval of the Senate Research Ethics Committee (SKE 01-13/2021) was obtained for the study design and data collection. All procedures were in accordance with the APA ethical standards, and the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The online form of informed consent was obtained from all participants included in the study.

MEASURES

Fear of COVID-19. In order to determine the fear of coronavirus infection, students rated the statement

Table 1

Participants' demographic and academic characteristics (N = 1294)

	<i>n (%)</i>
Gender	
Male	563 (43.5)
Female	731 (56.5)
Level of study	
Bachelor's degree	1000 (77.3)
Master's degree	294 (22.7)
Place of study	
Capital	945 (73.0)
Small city	349 (27.0)
Field of study	
Medical faculties	589 (45.5)
PA faculties*	705 (54.5)
Paid work (permanent or occasional)	
Yes	519 (40.1)
No	775 (59.9)

Note. *related to physical activity.

“I am anxious about the possibility of coronavirus infection and COVID-19” on a 7-point Likert type scale (0 – *decidedly false*, 1 – *false*, 2 – *somewhat false*, 3 – *hard to say*, 4 – *somewhat true*, 5 – *true*, 6 – *decidedly true*).

Future anxiety. To assess the individuals’ future anxiety the short version of the Future Anxiety Scale (the Dark Future scale) by Zaleski et al. (2019) was used. Participants rated five items on a 7-point Likert type scale from 0 (*decidedly false*) to 6 (*decidedly true*):

1. I am afraid that the problems which trouble me now will continue for a long time.
2. I am terrified by the thought that I might sometimes face life’s crises or difficulties.
3. I am afraid that in the future my life will change for the worse.
4. I am afraid that changes in the economic and political situation will threaten my future.
5. I am disturbed by the thought that in the future I won’t be able to achieve my goal.

The Polish version of the Dark Future scale is characterized by satisfactory reliability. In the study of the authors of the scale Cronbach’s α was .90, and test-retest reliability over a one-month interval was .62. In our study Cronbach’s α was .88.

Psychological well-being. The short version of the Psychological General Well-Being Index (PGWBI; Dupuy, 1990) was used. The PGWBI is a measure of the level of subjective psychological well-being and its short version consists of six items rated on a 6-point scale and measuring: anxiety (“Have you been bothered by nervousness or your ‘nerves’ during the past month?”); vitality (“How much energy, pep, or vitality did you have or feel during the past month?”; “I felt tired, worn out, used up, or exhausted during the past month”); depressed mood (“I felt downhearted and blue during the past month”); self-control (“I was emotionally stable and sure of myself during the past month”); positive well-being (“I felt cheerful and lighthearted during the past month”). Cronbach’s α values of the original version in the different studies were all above .80, thereby showing acceptable reliability, as well as when compared to the original instrument in full length (22 items; Dupuy, 1990). Cronbach’s α for the Polish version used in our research was .85.

STATISTICAL ANALYSIS

The non-parametric Mann-Whitney U test was used to determine the differences in fear of COVID-19. As significant differences were found in this variable between men and women, and the gender ratio differed depending on some explanatory variables (level and fields of study), analyses were performed separately for each gender.

The distribution of future anxiety did not meet the criteria of a normal distribution ($K-S = .07$, $p < .001$); however, the data on kurtosis ($-.42$) and skewness ($-.47$) allowed the use of the analysis of variance. Four-way analysis of covariance was used, introducing academic variables (place, level, field of study and paid work) as factors and gender as a covariate.

In order to establish the relationships between the variables, depending on the type of measurement scale, Spearman’s ρ and Pearson’s r coefficients were used.

RESULTS

FEAR OF COVID-19 AND FUTURE ANXIETY ACCORDING TO GENDER AND ACADEMIC CHARACTERISTICS

The ratings for the statement “I am anxious about the possibility of coronavirus infection and COVID-19” in the entire study group were as follows:

0 (<i>decidedly false</i>)	– 23.8%
1 (<i>false</i>)	– 15.2%
2 (<i>somewhat false</i>)	– 14.6%
3 (<i>hard to say</i>)	– 13.2%
4 (<i>somewhat true</i>)	– 12.2%
5 (<i>true</i>)	– 10.0%
6 (<i>decidedly true</i>)	– 11.1%

Less than 40.0% of students denied experiencing concerns about the possibility of contracting COVID-19, while about 20.0% confirmed them. The median was 2 (*somewhat false*).

Women (mean rank = 714.14) experienced a significantly stronger fear of developing COVID-19 than men (mean rank = 560.98) ($U = 157063$, $p < .001$). There were no significant differences among men depending on the place of study ($U = 31882.0$, $p = .675$), level of study ($U = 23985.5$, $p = .533$), field of study ($U = 35622.5$, $p = .675$) and paid work ($U = 37211.0$, $p = .943$). Women studying medical faculties experienced a greater fear of COVID-19 (mean rank = 384.54) than their colleagues from PA faculties (mean rank = 345.03) ($U = 59348.0$, $p = .011$). The place of study ($U = 46705.5$, $p = .106$), level of study ($U = 49115.0$, $p = .622$) and work ($U = 60486.5$, $p = .108$) did not significantly differentiate the fear of getting COVID-19 in women.

The Future Anxiety Scale has no standards, so the level of future anxiety experienced by students cannot be determined. The mean in the whole group was 18.66 ± 7.34 with a theoretical variability of 0-30 points. Female students felt a significantly stronger future anxiety than male students ($M_{\text{women}} = 20.90 \pm 6.87$, $M_{\text{men}} = 15.77 \pm 6.91$, $F(1, 1277) = 159.13$, $p < .001$, $\eta^2 = .111$). The main effects of the level of study ($F(1, 1277) = 0.01$, $p = .915$), place of study ($F(1, 1277) = 2.12$, $p = .145$), field of study ($F(1, 1277) = 0.73$,

$p = .393$) and work ($F(1, 1277) = 0.82, p = .367$) were not statistically significant.

There was a statistically significant, but small, interaction effect between the level of study and paid work ($F(1, 1277) = 5.07, p = .024, \eta^2 = .004$) (Figure 1). Paid work slightly differentiated future anxiety in bachelor's students. Among master's students, working people revealed a higher level of future anxiety. In the group of non-working people, a higher level of

future anxiety was observed in bachelor's students, while among the working people, higher levels of anxiety were experienced by master's students.

The effects of second-order interactions were also statistically significant, but very small:

- level of study \times field of study \times place of study ($F(1, 1277) = 6.08, p = .014, \eta^2 = .005$) (Figure 2 and Figure 3),
- level of study \times paid work \times place of study ($F(1, 1277) = 5.27, p = .022, \eta^2 = .004$) (Figure 4 and Figure 5).

In the group studying in the capital, future anxiety level of bachelor's students did not differ depending on the paid work. In the group of master's students, working students experienced stronger future anxiety than those who did not work. Among bachelor's students in a small town, a higher level of future anxiety was noted among people not working. At the master's level, working students experienced stronger anxiety.

Among people studying in the capital city, the level of future anxiety was higher in medical fields than in those related to physical activity, and slightly higher in master's students. Among master's students in a small town, a higher level of future anxiety

Figure 1

Future anxiety by level of study and paid work

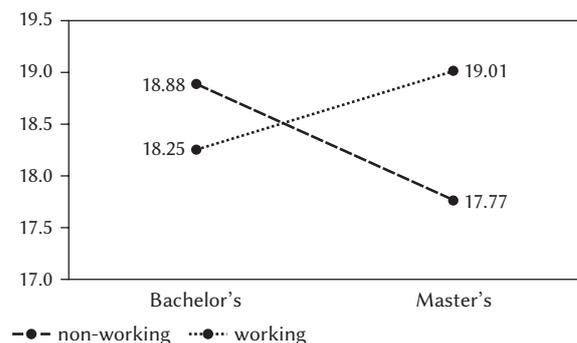


Figure 2

Future anxiety by level of study and paid work in people studying in the capital city

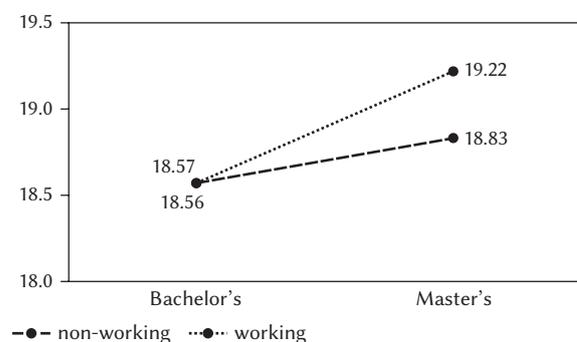


Figure 3

Future anxiety by level of study and paid work in people studying in a small town

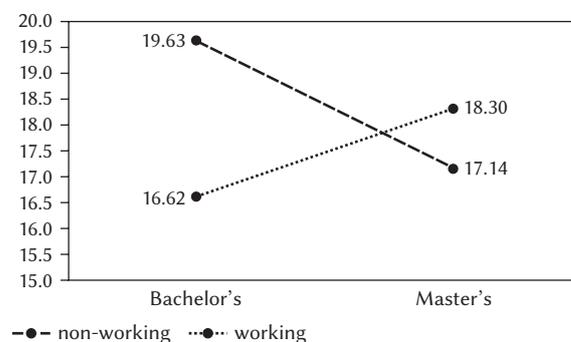


Figure 4

Future anxiety by level of study and fields of study in people studying in the capital city

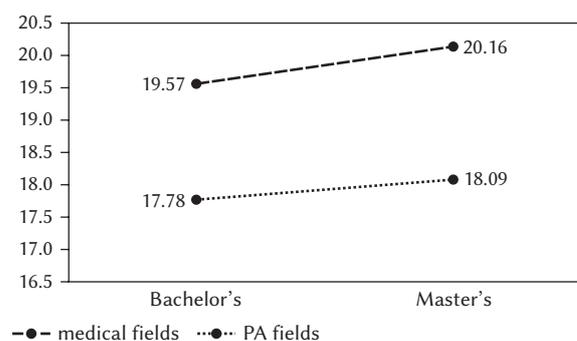
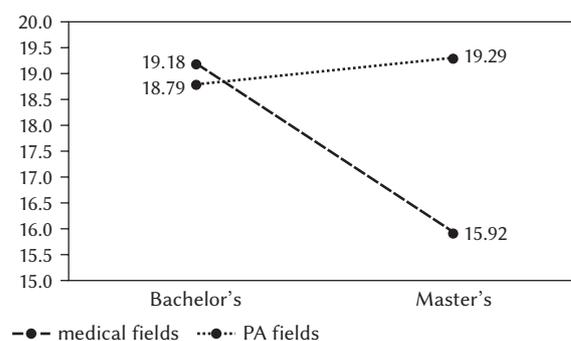


Figure 5

Future anxiety by level of study and fields of study in people studying in a small town



was found in medical faculties, while among bachelor students a slightly stronger anxiety was characteristic of students of PA faculties.

RELATIONSHIPS BETWEEN FEAR OF COVID/ FUTURE ANXIETY AND PSYCHOLOGICAL WELL-BEING

Fear of COVID-19 correlated positively but weakly with future anxiety ($\rho = .34, p < .001$). There were negative relationships with psychological well-being, weak for fear of COVID-19 ($\rho = -.21, p < .001$) and moderate for future anxiety ($\rho = -.49, p < .001$).

DISCUSSION

One-third of the students we surveyed confirmed that they felt fear of contracting the coronavirus; more than half answered in the negative. These rates appear to be lower than those obtained in the studies carried out during the first wave of the COVID-19 pandemic (Luo et al., 2021). This may be the result of adaptation to the stressor that occurred during the eight months of the pandemic. During the first wave of the pandemic, little was known about the pathogen and the disease it caused. During the second wave, both the disease itself and the measures to reduce the risk of infection were better known, which may have reduced the fear of infection. As the Future Anxiety Scale has not been normalized, it is difficult to determine the level of future anxiety in the studied trial. Paredes et al. (2021), when studying future anxiety during the COVID pandemic, used a different version of the scale, which makes it impossible to compare the results. In the study of Polish patients waiting for bariatric surgery, the mean score was 13.21, so it was lower than the result obtained by the students we studied during the second wave of the COVID-19 pandemic (18.66). This confirms the observations of other authors that the COVID-19 pandemic has increased individuals' worries about their present and future situations (Giallonardo et al., 2020; Usher et al., 2020), since there is not a known end to the crisis, and its effects cannot be controlled (Liu et al., 2020; Paredes et al., 2021).

Women experienced a significantly stronger fear of developing COVID-19 and future anxiety than men. Studies of university students have mostly confirmed these differences, with female students found to show higher levels of anxiety (Bourion-Bedes et al., 2020; Huang & Zhao, 2020; Li et al., 2020; Meda et al., 2020; Wang & Zhao, 2020) and fear of COVID-19 (Rodríguez-Hidalgo et al., 2020). Similar results in a study of Polish students were obtained by Rogowska et al. (2020) and Debowska et al. (2022). This difference also occurs in the general population – women had higher

scores on the Coronavirus Anxiety Scale compared to men (Lee et al., 2020; Luo et al., 2021).

Biological and psychological factors can be considered to explain the differences in fear and anxiety between men and women. Women are more predisposed to experience fear and general anxiety as well as future anxiety because they are characterized by greater emotional reactivity and neuroticisms, i.e. are more sensitive to negative stimuli (Zaleski, 2018) and thus vulnerable to anxiety disorders (Lippold et al., 2020). Moreover, expressing fear of illness is more accepted in women than in men (Bakioğlu et al., 2021). Women and men also differ in their ability to reduce negative emotional states by using effective strategies of affective regulation (Nolen-Hoeksema, 2012).

The field of study slightly differentiated the level of fear of falling ill with COVID-19 and future anxiety. Only female students of medical faculties experienced a greater fear of COVID-19 than their colleagues from PA faculties. This partially supports our expectations of greater fear in medical students. The research was conducted during the second wave of the pandemic in November 2020. At that time, medical students underwent internships and clinical classes in hospitals and other healthcare facilities, where the risk of virus infection was definitely higher than during contact classes conducted by PA students. Healthcare workers had a greater fear of COVID-19 than those in other professions (Luo et al., 2021; Vagni et al., 2020) and were at high risk of mental illness (Huang & Zhao, 2020; Vindegaard & Benros, 2020). These differences occurred only in women, possibly because of their greater emotional reactivity.

As in the sample of Australian students (Lyons et al., 2020), no significant differences were found depending on the level of study. The opposite results were obtained in Russia and Belarus, where undergraduate students have been observed to be more fearful of COVID-19 than graduates (Reznik et al., 2021). Perhaps cultural factors play a role, and this issue requires further research.

The level of future anxiety was lower in women from PA faculties than from medical faculties. The results of the studies in other countries confirm the particularly high negative impact of the pandemic on the mental health of medical students (Chen et al., 2020; Ullah & Amin, 2020) and social work students (Apgar & Cadmus, 2022). The field of study diversified the level of anxiety among students in China (Wang & Zhao, 2020). In Poland, PA students at the University of Opole revealed lower levels of anxiety and perceived stress than their peers studying engineering (Rogowska et al., 2020). Looking for an explanation for these differences, the authors referred to the increased physical activity of PA students. It is known that there is a positive relationship between physical activity levels and various mental health indices (Panza et al., 2019). Indeed, in our trial the level

of physical activity resulting from obligatory classes included in the university curriculum and voluntary sports differed and was highest in students of physical education and sport. Physical inactivity significantly predicted high perceived pandemic stress in Turkish students (Aslan et al., 2020).

Working students experienced slightly stronger future anxiety, probably related to the fear of losing their jobs due to the pandemic. Many students worked on commission, without a permanent employment contract, which increased the risk of being fired in an unstable economic situation. It can be assumed that non-working students were supported by their parents and felt less threatened by the risk of losing their livelihood. Worries about the future consequences of the pandemic are understandable in people with less financial security who may stand to suffer more in terms of short- and long-term economic disruption (McElroy et al., 2020; McKibbin & Fernando, 2020). Unfortunately, the study did not collect information about the nature of the work performed. It is quite likely that medical students worked in healthcare facilities where the risk of virus infection was relatively high. This may have further intensified their future anxiety.

Our results do not confirm the expected differences depending on the place of study. Similarly, place of study did not diversify the level of stress perceived by university students in Turkey (Aslan et al., 2020) and China (Wang & Zhao, 2020). Chinese nursing students from cities, on the other hand, exhibited more severe anxiety and fear than respondents from rural areas (Huang et al., 2020).

Most previous studies detected a link between fear of COVID-19 and anxiety (Mertens et al., 2020). COVID-19 has increased individuals' worries about their present and future situations (Giallonardo et al., 2020; Usher et al., 2020) due to the uncontrollable nature of this stressor (Liu et al., 2020) as well as its ability to trigger anxiety related to death (Roy et al., 2020). University students are also worried about potential unfavorable changes to their future state.

The present study also found a positive but weak correlation between fear of COVID-19 and future anxiety, but the data do not allow us to establish cause-and-effect relationships. More advanced analyses by other researchers indicate that, on the one hand, coronavirus anxiety had a significant effect on fear of COVID-19 (Yıldırım & Güler, 2021) and, on other hand, perceived COVID-19 threat activate future anxiety (Paredes et al., 2021). There seems to be a positive feedback loop – future anxiety and fear of COVID-19 intensify each other.

The final point concerns the relationship between fear of COVID-19 and future anxiety, and psychological well-being. We found negative relationships with psychological well-being, weak for fear of COVID-19 and moderate for future anxiety, which confirms the

results of previous studies (Lee, 2020; Lee et al., 2021; Skalski et al., 2020). COVID anxiety positively correlated with indicators of mental difficulties: functional impairment, fear about coronavirus, alcohol or drug coping, negative religious coping, extreme hopelessness, and passive suicidal ideation (Lee et al., 2020, 2021). Paredes et al. (2021) confirmed the hypothesis that perceived threat of COVID-19 had a negative effect on subjective mental well-being mediated by its positive effect on future anxiety and interpreted this relationship as follows: “the pandemic’s perceived threat generates uncertainty and fear, increasing stress and vulnerability, which, in turn, has a detrimental impact on subjective mental well-being” (p. 4). In a unifactorial experimental study, Silva et al. (2021) found that the increase of COVID-19 anxiety was associated with worse indicators of psychological well-being, that individual differences in fear of death were related to well-being, and that this relationship was mediated by anxiety in the face of COVID-19.

This study has certain limitations. Only students from one university were examined, so the possibility to generalize the results is limited and further research is required in a population of university students and, more broadly, young adults.

The self-reported data we obtained may be affected by social desirability bias, which is particularly likely for the reasons indicated above in the case of men’s statements of fear of COVID-19 and future anxiety.

The personal survey included only basic information about gender, age, level and field of study. No information was obtained about the financial situation of students, the nature of their work, and who they run a household with. This information would be useful in interpreting the between-group differences found in the study.

The lack of norms for the Future Anxiety Scale made it impossible to precisely interpret the results; they could only be compared with available results from other authors.

Conducting research via the Internet made it necessary to use the shortest and simplest versions of the measurement scales. Probably, the use of the full version of PGWBI and the COVID Anxiety Scale would provide more interesting data about relationships between psychological well-being and anxiety about the pandemic.

CONCLUSIONS

Our findings show that less than half of young adults studying at the university of physical education in Poland report experiencing fear of COVID-19, and their future anxiety is higher than in non-pandemic conditions. A moderate level of pandemic fear can reduce the risk of contracting COVID-19, because it increases the likelihood of taking preventive actions.

However, a strong fear of getting sick and the associated anxiety for the future have a negative effect on psychological well-being and can lead to mental health problems. Because future anxiety was stronger in women, medical students, some master's students and working people, preventive measures should be taken to prevent excessive anxiety and to promote mental health in these groups.

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

FUNDING SOURCE

This work was supported by the Ministry of Education and Science in Poland in the year 2021 under Research Group no. 4 at the Jozef Pilsudski University of Physical Education in Warsaw.

DISCLOSURE

The authors declare no conflict of interest.

REFERENCES

- American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). APA Publishing.
- American Psychiatric Association (2020, March 25). *New poll: COVID-19 impacting mental well-being: Americans feeling anxious, especially for loved ones; older adults are less anxious*. Retrieved from <https://www.psychiatry.org/newsroom/news-releases/new-poll-covid-19-impacting-mental-wellbeing-americans-feeling-anxious-especially-forloved-ones-older-adults-are-less-anxious>
- Apgar, D., & Cadmus, T. (2022). Using mixed methods to assess coping and self-regulation skills of undergraduate social work students impacted by COVID-19. *Clinical Social Work Journal*, *50*, 55–66. <https://doi.org/10.1007/s10615-021-00790-3>
- Asanov, I., Flores, F., McKenzie, D., Mensmann, M., & Schulte, M. (2021). Remote-learning, time-use, and mental health of Ecuadorian high-school students during the COVID19 quarantine. *World Development*, *138*, 105225. <https://doi.org/j.world-dev.2020.105225>
- Aslan, I., Ochnik, D., & Çınar, O. (2020). Exploring perceived stress among students in Turkey during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, *17*, 8961. <https://doi.org/10.3390/ijerph17238961>
- Auerbach, R. P., Alonso, J., Axinn, W. G., Cuijpers, P., Ebert, D. D., Green, J. G., Hwang, I., Kessler, R. C., Liu, H., Mortier, P., Nock, M. K., Pinder-Amaker, S., Sampson, N. A., Aguilar-Gaxiola, S., Al-Hamzawi, A., Andrade, L. H., Benjet, C., Caldas-de-Almeida, J. M., Demyttenaere, K., Florescu, S., ... Bruffaerts, R. (2016). Mental disorders among college students in the World Health Organization World Mental Health Surveys. *Psychological Medicine*, *46*, 2955–2970. <https://doi.org/10.1017/S0033291716001665>
- Bakioğlu, F., Korkmaz, O., & Ercan, H. (2021). Fear of COVID-19 and positivity: Mediating role of intolerance of uncertainty, depression, anxiety, and stress. *International Journal of Mental Health and Addiction*, *19*, 2369–2382. <https://doi.org/10.1007/s11469-020-00331-y>
- Bourion-Bédès, S., Tarquinio, C., Batt, M., Tarquinio, P., Lebreuilly, R., Sorsana, C., Legrand, K., Rousseau, H., & Baumann, C. (2021). Stress and associated factors among French university students under the COVID-19 lockdown: The results of the PIMS-CoV 19 study. *Journal of Affective Disorders*, *283*, 108–114. <https://doi.org/10.1016/j.jad.2021.01.041>
- Chen, Y., Zhou, H., Zhou, Y., & Zhou, F. (2020). Prevalence of self-reported depression and anxiety among pediatric staff members during the COVID-19 outbreak in Giyang, China. *Psychiatry Research*, *288*, 113005. <https://doi.org/10.1016/j.psychres.2020.113005>
- Debowska, A., Horeczy, B., Boduszek, D., & Dolinski, D. (2022). A repeated cross-sectional survey assessing university students' stress, depression, anxiety, and suicidality in the early stages of the COVID-19 pandemic in Poland. *Psychological Medicine*, *52*, 3744–3747. <https://doi.org/10.1017/S003329172000392X>
- De Oliveira Araújo, F. J., de Lima, L. S. A., Cidade, P. I. M., Nobre, C. B., & Neto, M. L. R. (2020). Impact of Sars-Cov-2 and its reverberation in global higher education and mental health. *Psychiatry Research*, *288*, 112977. <https://doi.org/10.1016/j.psychres.2020.112977>
- Dupuy, H. J. (1990). The psychological general well-being (PGWB) index. In N. K. Wenger, M. E. C. Mattson, D. Furburg, & J. Elinson (Eds.). *Assessment of quality of life in clinical trials of cardiovascular therapies* (pp. 170–183). Le Jacq Publishing.
- Giallonardo, V., Sampogna, G., Del Vecchio, V., Luciano, M., Albert, U., Carmassi, C., Carrà, G., Cirulli, F., Dell'Osso, B., Nanni, M. G., Pompili, M., Sani, G., Tortorella, A., Volpe, U., & Fiorillo, A. (2020). The impact of quarantine and physical distancing following COVID-19 on mental health: Study protocol of a multicentric Italian population trial. *Frontiers in Psychiatry*, *11*, 533. <https://doi.org/10.3389/fpsy.2020.00533>
- Hoover, E. (2020). *Distanced learning*. Chronicle of Higher Education. Retrieved from <https://www.chronicle.com/article/distancedlearning>

- Huang, L., Lei, W., Xu, F., Liu, H., & Yu, L. (2020). Emotional responses and coping strategies in nurses and nursing students during COVID-19 outbreak: a comparative study. *PLoS One*, *15*, e0237303. <https://doi.org/10.1371/journal.pone.0237303>
- Huang, Y., & Zhao, N. (2020). Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. *Psychiatry Research*, *288*, 112954. <https://doi.org/10.1016/j.psychres.2020.112954>
- Lee, S. A. (2020). Coronavirus Anxiety Scale: a brief mental health screener for COVID-19 related anxiety. *Death Study*, *44*, 393–401. <https://doi.org/10.1080/07481187.2020.1748481>
- Lee, S. A., Jobe, M. C., & Mathis, A. A. (2021). Mental health characteristics associated with dysfunctional coronavirus anxiety. *Psychological Medicine*, *51*, 1403–1404. <https://doi.org/10.1017/S003329172000121X>
- Lee, S. A., Mathis, A. A., Jobe, M. C., & Pappalardo, E. A. (2020). Clinically significant fear and anxiety of COVID-19: a psychometric examination of the Coronavirus Anxiety Scale. *Psychiatry Research*, *290*, 113112. <https://doi.org/10.1016/j.psychres.2020.113112>
- Li, X., Lv, S., Liu, L., Chen, R., Chen, J., Liang, S., Tang, S., & Zhao, J. (2020). COVID-19 in Guangdong: Immediate perceptions and psychological impact on 304,167 college students. *Frontiers in Psychology*, *11*, 2024. <https://doi.org/10.3389/fpsyg.2020.02024>
- Lippold, J. V., Laske, J. I., Hogeterp, S. A., Duke, É., Grünhage, T., & Reuter, M. (2020). The role of personality, political attitudes and socio-demographic characteristics in explaining individual differences in fear of coronavirus: a comparison over time and across countries. *Frontiers in Psychology*, *11*, 552305. <https://doi.org/10.3389/fpsyg.2020.552305>
- Liu, C. H., Zhang, E., Wong, G. T. F., Hyun, S., & Hahm, H. (2020). Factors associated with depression, anxiety, and PTSD symptomatology during the COVID-19 pandemic: Clinical implications for U.S. young adult mental health. *Psychiatry Research*, *290*, 113172. <https://doi.org/10.1016/j.psychres.2020.113172>
- Luo, F., Ghanei Gheshlagh, R., Dalvand, S., Saedmoucheshi, S., & Li, Q. (2021). Systematic review and meta-analysis of fear of COVID-19. *Frontiers in Psychology*, *12*, 661078. <https://doi.org/10.3389/fpsyg.2021.661078>
- Lyons, Z., Wilcox, H., Leung, L., & Dearsley, O. (2020). COVID-19 and the mental well-being of Australian medical students: Impact, concerns and coping strategies used. *Australasian Psychiatry*, *28*, 649–652. <https://doi.org/10.1177/1039856220947945>
- McElroy, E., Patalay, P., Moltrecht, B., Shevlin, M., Shum, A., Creswell, C., & Waite, P. (2020). Demographic and health factors associated with pandemic anxiety in the context of COVID-19. *British Journal of Health Psychology*, *25*, 934–944. <https://doi.org/10.1111/bjhp.12470>
- McKibbin, W. J., & Fernando, R. (2020). Macroeconomic impacts of COVID-19: Seven scenarios. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3547729>
- Meda, N., Pardini, S., Slongo, I., Bodini, L., Rigobello, P., Visioli, F., & Novara, C. (2020). COVID-19 and depressive symptoms in students before and during lockdown. *medRxiv*. <https://doi.org/10.1101/2020.04.27.20081695>
- Mertens, G., Gerritsen, L., Duijndam, S., Salemink, E., & Engelhard, I. M. (2020). Fear of the coronavirus (COVID-19): Predictors in an online study conducted in March 2020. *Journal of Anxiety Disorders*, *74*, 102258. <https://doi.org/10.1016/j.janxdis.2020.102258>
- Nolen-Hoeksema, S. (2012). Emotion regulation and psychopathology: The role of gender. *Annual Review of Clinical Psychology*, *8*, 161–187. <https://doi.org/10.1146/annurev-clinpsy-032511-143109>
- Odriozola-González, P., Planchuelo-Gómez, A., Irurtia, M. J., & de Luis-García, R. (2020). Psychological effects of the COVID-19 outbreak and lockdown among students and workers of a Spanish university. *Psychiatry Research*, *290*, 113108. <https://doi.org/10.1016/j.psychres.2020.113108>
- Ohman, A. (2000). Fear and anxiety: Evolutionary, cognitive, and clinical perspectives. In M. Lewis & J. M. Haviland-Jones (Eds.), *Handbook of emotions* (2nd ed., pp. 573–593). Guilford.
- Panza, G. A., Taylor, B. A., Thompson, P. D., White, C. M., & Pescatello, L. S. (2019). Physical activity intensity and subjective well-being in healthy adults. *Journal of Health Psychology*, *24*, 1257–1267. <https://doi.org/10.1177/1359105317691589>
- Paredes, M. R., Apaolaza, V., Fernandez-Robin, C., Hartmann, P., & Yanez-Martinez, D. (2021). The impact of the COVID-19 pandemic on subjective mental well-being: The interplay of perceived threat, future anxiety and resilience. *Personality and Individual Differences*, *170*, 110455. <https://doi.org/10.1016/j.paid.2020.110455>
- Prasath, P. R., Mather, P. C., Suniti Bhat, C., & James, J. K. (2021). University student well-being during COVID-19: The role of psychological capital and coping strategies. *The Professional Counselor*, *11*, 46–60. <https://doi.org/10.15241/prp.11.1.46>
- Reznik, A., Gritsenko, V., Konstantinov, V., Khamenka, N., & Isralowitz, R. (2021). COVID-19 fear in Eastern Europe: Validation of the Fear of COVID-19 Scale. *International Journal of Mental Health and Addiction*, *19*, 1903–1908. <https://doi.org/10.1007/s11469-020-00283-3>
- Rodríguez-Hidalgo, A. J., Pantaleón, Y., Dios, I., & Falla, D. (2020). Fear of COVID-19, stress, and anxiety in university undergraduate students: a predictive model for depression. *Frontiers in Psychology*, *11*, 591797. <https://doi.org/10.3389/fpsyg.2020.591797>

- Rogowska, A. M., Kusnierz, C., & Bokszczanin, A. (2020). Examining anxiety, life satisfaction, general health, stress and coping styles during COVID-19 pandemic in Polish sample of university students. *Psychology Research and Behavior Management, 13*, 797–811. <https://doi.org/10.2147/prbm.s266511>
- Roy, D., Tripathy, S., Kar, S., Sharma, N., Verma, S., & Kaushal, V. (2020). Study of knowledge, attitude, anxiety and perceived mental healthcare need in Indian population during COVID-19 pandemic. *Asian Journal of Psychiatry, 51*, 102083. <https://doi.org/10.1016/j.ajp.2020.102083>
- Salehi, L., Rahimzadeh, M., Molaei, E., Zaheri H., & Esmaelzadeh-Saeieh, S. (2020). The relationship among fear and anxiety of COVID-19, pregnancy experience, and mental health disorder in pregnant women: a structural equation model. *Brain and Behavior, 10*, e01835. <https://doi.org/10.1002/brb3.1835>
- Satici, B., Saricali, M., Satici, S. A., & Griffiths, M. (2022). Intolerance of uncertainty and mental wellbeing: Serial mediation by rumination and fear of COVID-19. *International Journal of Mental Health and Addiction, 20*, 2731–2742. <https://doi.org/10.1007/s11469-020-00305-0>
- Silva, W. A. D., de Sampaio Brito, T. R., & Pereira, C. R. (2021). Anxiety associated with COVID-19 and concerns about death: Impacts on psychological wellbeing. *Personality and Individual Differences, 176*, 110772. <https://doi.org/10.1016/j.paid.2021.110772>
- Skalski, S., Uram, P., Dobrakowski, P., & Kwiatkowska, A. (2020). Thinking too much about the novel coronavirus. The link between persistent thinking about COVID-19, SARS-CoV-2 anxiety and trauma effects. *Current Issues in Personality Psychology, 8*, 169–174. <https://doi.org/10.5114/cipp.2020.100094>
- Szczepańska, A., & Pietrzyka, K. (2023). The COVID-19 epidemic in Poland and its influence on the quality of life of university students (young adults) in the context of restricted access to public spaces. *Journal of Public Health, 31*, 295–305. <https://doi.org/10.1007/s10389-020-01456-z>
- Tucholska, K., Gulla, B., Grabowska, A., & Major, P. (2022). Time perspective, future anxiety, and hope for success in individuals awaiting bariatric surgery. *Health Psychology Report, 10*, 111–121. <https://doi.org/10.5114/hpr.2021.105259>
- Ullah, R., & Amin, S. (2020). The psychological impact of COVID-19 on medical students. *Psychiatry Research, 288*, 113020. <https://doi.org/10.1016/j.psychres.2020.113020>
- Usher, K., Durkin, J., & Bhullar, N. (2020). The COVID-19 pandemic and mental health impacts. *International Journal of Mental Health Nursing, 29*, 315–318. <https://doi.org/10.1111/inm.12726>
- Vagni, M., Maiorano, T., Giostra, V., & Pajardi, D. (2020). Coping with COVID-19: Emergency stress, secondary trauma and self-efficacy in health-care and emergency workers in Italy. *Frontiers in Psychology, 11*, 566912. <https://doi.org/10.3389/fpsyg.2020.566912>
- Vindegaard, N., & Benros, M. E. (2020). COVID-19 pandemic and mental health consequences: Systematic review of the current evidence. *Behavior and Immunity, 89*, 531–542. <https://doi.org/10.1016/j.bbi.2020.05.048>
- Wang, C., & Zhao, H. (2020). The impact of COVID-19 on anxiety in Chinese university students. *Frontiers in Psychology, 11*, 1168. <https://doi.org/10.3389/fpsyg.2020.01168>
- Yıldırım, M., & Güler, A. (2021). Coronavirus anxiety, fear of COVID-19, hope and resilience in health-care workers: a moderated mediation model study. *Health Psychology Report, 9*, 388–397. <https://doi.org/10.5114/hpr.2021.1073>
- Zaleski, Z. (1996). Future anxiety: Concept, measurement, and preliminary research. *Personality and Individual Differences, 21*, 165–174. [https://doi.org/10.1016/0191-8869\(96\)00070-0](https://doi.org/10.1016/0191-8869(96)00070-0)
- Zaleski, Z. (2018). *Psychologia lęku przed przyszłością* [Psychology of future anxiety]. Difin.
- Zaleski, Z., Sobol-Kwapinska, M., Przepiorka, A., & Meisner, M. (2019). Development and validation of the Dark Future scale. *Time and Society, 28*, 107–123. <https://doi.org/10.1177/0961463X16678257>