

Beata Hintze<sup>1</sup>, Małgorzata Woźniak-Prus<sup>2</sup>, Magdalena Gawrych<sup>3</sup>, Andrzej Cudo<sup>4</sup>

## Predyktory dystresu wśród pracowników uczelni wyższych w czasie pandemii COVID-19. Część I. Zmienne socjodemograficzne, zawodowe i związane z pandemią

Predictors of university staff distress during the COVID-19 pandemic.

Part I. Sociodemographic, occupational and pandemic factors

<sup>1</sup> Zakład Neuropsychologii i Neurobiologii, Instytut Psychologii, Akademia Pedagogiki Specjalnej im. Marii Grzegorzewskiej, Warszawa, Polska

<sup>2</sup> Katedra Psychologii Klinicznej Dziecka i Rodziny, Wydział Psychologii, Uniwersytet Warszawski, Warszawa, Polska

<sup>3</sup> Zakład Psychologii Człowieka Dorosłego, Instytut Psychologii, Akademia Pedagogiki Specjalnej im. Marii Grzegorzewskiej, Warszawa, Polska

<sup>4</sup> Katedra Psychologii Eksperymentalnej, Instytut Psychologii, Katolicki Uniwersytet Lubelski Jana Pawła II, Lublin, Polska

Adres do korespondencji: Beata Hintze, Zakład Neuropsychologii i Neurobiologii, Instytut Psychologii, Akademia Pedagogiki Specjalnej im. Marii Grzegorzewskiej, ul. Szczęśliwicka 40, 02-353 Warszawa, e-mail: bhintze@aps.edu.pl

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### ORCID iDs

1. Beata Hintze <https://orcid.org/0000-0003-1899-2143>

3. Magdalena Gawrych <https://orcid.org/0000-0003-0668-5437>

2. Małgorzata Woźniak-Prus <https://orcid.org/0000-0002-9851-7176>

4. Andrzej Cudo <https://orcid.org/0000-0001-7424-8576>

### Streszczenie

**Wprowadzenie i cel:** Identyfikacja predyktorów nasilenia depresji, lęku i stresu w zakresie czynników socjodemograficznych, zawodowych oraz związanych z pandemią COVID-19 w grupie kobiet i mężczyzn – pracowników uczelni wyższych. **Materiał i metody:** Badanie przeprowadzono wśród pracowników uczelni wyższych w okresie sześciu miesięcy (od marca do sierpnia 2021 roku) w czasie trwania trzeciej fali pandemii COVID-19 za pośrednictwem platformy Google. Wykorzystano częściowo ustrukturyzowane kwestionariusze dotyczące zmiennych socjodemograficznych, doświadczeń związanych z pandemią, stresorów wynikających z nauczania zdalnego oraz Skalę Depresji, Lęku i Stresu (Depression, Anxiety, and Stress Scale, DASS-21) do pomiaru zdrowia psychicznego. **Wyniki:** W badaniu wzięło udział 1015 pracowników uczelni wyższych; 68,3% stanowiły kobiety. Uczestnicy byli w wieku 22–82 lata ( $M = 44,39$  roku,  $SD = 11,4$ ). Stwierdzono istotne różnice w zakresie zmiennych socjodemograficznych, obaw związanych z zachorowaniem na COVID-19, poczucia obciążenia pandemią między kobietami i mężczyznami. Odnotowano także wyższe nasilenie lęku ocenianego skalą DASS-21 u kobiet. Uzyskano odmienne modele dla nasilenia objawów depresji, lęku i stresu. **Wnioski:** W czasie pandemii COVID-19 badane kobiety miały wyższy poziom lęku w porównaniu z mężczyznami. Niezależnie od płci czynnikami ryzyka nasilenia dystresu były choroba przewlekła i młodszy wiek, a czynnikami ochronnymi – wyższy poziom wykształcenia (stopień naukowy) i bycie w związku (małżeńskim lub nieformalnym). Dla kobiet dodatkowo czynnikiem ochronnym było zamieszkanie w małym mieście i zatrudnienie na stanowisku nauczyciela akademickiego. Dla mężczyzn istotnym czynnikiem ryzyka była śmierć bliskiej osoby z powodu COVID-19.

**Słowa kluczowe:** depresja, lęk, stres, pracownicy uczelni wyższych, COVID-19

### Abstract

**Introduction and objective:** To identify predictors of depression, anxiety, and stress within the sociodemographic, occupational, and COVID-19-related factors in the group of female and male university staff. **Materials and methods:** The study was conducted over six months (from March to August 2021) during the third wave of the COVID-19 pandemic among university staff using the Google platform. The semi-structured questionnaire used in the study included sociodemographic data, pandemic experiences, stressors from remote teaching, and the Depression, Anxiety, and Stress Scale (DASS-21) to measure mental health. **Results:** In the study, we questioned 1,015 university staff, including 68.3% women. The participants ranged from 22 to 82 years ( $M = 44.39$  years,  $SD = 11.4$ ). Significant differences were obtained between women and men regarding sociodemographic variables, concerns about COVID-19, and pandemic burdens. There was also a higher severity of anxiety assessed by the DASS-21 in women. Different models were obtained for the severity of symptoms of depression, anxiety, and stress. **Conclusions:** Women had higher anxiety levels than men during the COVID-19 pandemic. Regardless of gender, mental health risk factors were chronic illness and younger age; protective factors – a higher level of education (academic degree) and being in a relationship (married or informal). For women, an additional protective factor was living in a small town and employing them as academic teachers. For men, a significant risk factor was the death of a familiar person due to COVID-19.

**Keywords:** depression, anxiety, stress, university staff, COVID-19

## INTRODUCTION

The COVID-19 pandemic, spanning the period of 2019 to 2023, has led to significant and multifaceted changes in all countries and societies. Therefore, many studies have been devoted to assessing people's mental state in subsequent waves of the pandemic in different countries (Shevlin et al., 2023). The results of most studies have shown an increase in mental disorders, particularly in the severity of stress, anxiety, or depression symptoms in various age groups (Gruber et al., 2021). The COVID-19 pandemic has already transformed into a situation of chronic stress, becoming a reality that significantly interferes with and changes the current functioning. The chronicity of the pandemic and the experience of subsequent waves may foster the development of direct and deferred consequences in various areas of life, including mental health. As such, the World Health Organization (WHO) recommended in 2020 that regular mental health screenings be conducted worldwide to describe people's reactions and behaviours during the pandemic and to plan interventions to reduce their negative consequences (World Health Organization, 2020). One of the priorities is the assessment of the mental condition and monitoring the psychological effects of the ongoing pandemic among different social and professional groups (Holmes et al., 2020; Lotzin et al., 2020) because negative consequences may be extended over time and last longer than the pandemic itself (Shigemura et al., 2020).

The medical staff is most exposed to the negative consequences of the pandemic. Much research has been carried out in this professional group across various countries, including Poland (Barczak et al., 2021). However, a sudden change of the teaching form and prolonged stress are also significant risk factors for the psychosocial functioning of university employees. Around the world, traditional teaching in classrooms and colleges has changed overnight to distance learning, known as remote learning. According to UNESCO, the unexpected closure of schools and the transition to learning platforms is a psychological burden for teachers at different levels of education, associated with frustration, uncertainty, and separation (ECLAC/OREALC/UNESCO, 2020). Studies conducted on teachers' mental health in different countries have shown an increase in stress, anxiety, and depression symptoms in this professional group (Klapproth et al., 2020; Santamaría et al., 2021). However, research among academic staff is relatively limited. The results of an Israeli study showed an increase in stress levels of 24% among academic teachers during the transition to remote learning compared to the level of previous years before the pandemic (an increase from 6.1% in lecturers during traditional education to 30.4% in remote learning) (Besser et al., 2022).

Therefore, our study which is of significant importance, aimed to assess the determinants of the severity of depression, anxiety, and stress among university employees. Research of this particular professional group is crucial due to the specificity and importance of the work performed and

the education of students in various areas – future professional staff. Although remote learning was already known and introduced at universities (also in Poland, e.g., WINDOW studies conducted by the Warsaw University of Technology), the transition to online teaching in connection with the pandemic has been defined as emergency remote teaching (Bozkurt and Sharma, 2020; Hodges et al., 2020).

Studies of mental conditions in the Polish population at the beginning of the pandemic showed that the severity of anxiety and depression was higher in the youngest people (18–29 years) (Gambin et al., 2023). Therefore, it can be assumed that the need to deal with students' emotions and difficulties was an additional burden for both lecturers and other university staff, whose cooperation with the education process and the efficiency of the university as an organisation.

Hence, it is essential to identify risk factors and protect the mental health condition of different groups of university staff during the pandemic so that the necessary preventive and therapeutic interventions can be implemented. Furthermore, poor mental health of academic staff can harm the quality of education, and reduce support for students' cognitive and professional development. Given the importance of identifying groups of university employees who may particularly need psychological support, for the purpose of paper, we have narrowed the analyses presented to assess factors of a sociodemographic nature related to their health status, job specifics, and the burden of the COVID-19 pandemic as predictors of psychological distress of university staff.

The presentations of the results were divided into two parts, constituting subsequent articles. The first will present analyses of the determinants of severity of depression, anxiety, and stress of university staff by gender, as it seems that the situation of women and men in terms of their social roles (Kmita, 2016) and the risk of mental health problems is different. The second part will present in-depth analyses, limitations of the study, and possible practical implications.

## MATERIALS AND METHODS

### Participants

The study was conducted among of 1,015 university employees. However, 26 people with outliers or missing data were removed to ensure the quality of the data. Consequently, the final sample consisted of 989 participants (675 female;  $M = 44.39$  years,  $SD = 11.40$ ; age range: 22–82 years). The sample characteristics and sociodemographic variables are shown in Tab. 1.

### Procedure

The study was conducted over six months (from March to August 2021) using the Google platform during the third wave of the COVID-19 pandemic. Invitations to participate

Variable	Category	Sample (N = 989)	
		n	Percent
Gender	Female	675	68.3%
	Male	314	31.7%
Work residence	Small city (between 20,000 and 99,000 residents)	107	10.8%
	Medium city (between 100,000 and 349,000 residents)	269	27.2%
	Large city (above 350,000 residents) without the capital city	242	24.5%
	Capital city	363	36.7%
	Other	8	0.8%
Marital status	Single	168	17.0%
	Non-formal relationship	164	16.6%
	Married	575	58.1%
	Divorced	71	7.2%
	Widowed	6	0.6%
	Other	5	0.5%
Education	Secondary and post-secondary education	22	2.2%
	Bachelor and master degree	452	45.7%
	PhD degree	306	30.9%
	Habilitation and professor degree	205	20.7%
	Other	4	0.4%
University status	Academic teacher	631	63.8%
	Other academic staff	358	36.2%

Tab. 1. Sociodemographic variables (N = 989)

in the study were sent to employees of Polish universities with the consent of the Rectors. In addition, the consent of the Commission for Research Ethics No. 14/2021 was obtained to conduct the research.

## Measures

The study used the Depression, Anxiety, and Stress Scale (DASS-21) (Lovibond and Lovibond, 1995) in Polish translation (Makara-Studzińska et al., 2020). DASS-21 had good psychometric properties in the present study (Cronbach's alpha equalled 0.91 for the depression subscale, 0.84 for the anxiety subscale, and 0.90 for the stress subscale; McDonald's omega equalled 0.91 for the depression subscale, 0.84 for anxiety subscale, and 0.90 for stress subscale).

The Pandemic Burden Scale was constructed to assess the risk and protection factors related to the COVID-19 pandemic. The subject responded to nine positions using a five-point scale of answers from 1 – “this is not a challenge/difficulty for me” to 5 – “it is a challenge/difficulty for me”. The higher the scores the subjects received, the higher the level of the pandemic burden they had. The Cronbach's alpha equalled 0.87 for this study.

Sociodemographic data and information on the nature of the work were collected through separate questions created for the study. To assess the participants' overall health, they were asked about chronic somatic and mental disease treatment.

## Statistical analysis

In order to analyse the differences between university staff in terms of their sex, sociodemographic, and pandemic situation, the  $\chi^2$  test was used. The effect size for the  $\chi^2$  test was calculated using Cramér's V. Additionally, to assess the differences between female and male university staff and take into account the non-normal distribution of analysed variables, the Mann-Whitney two-sample tests were used. Additionally, descriptive statistics such as mean (*M*), standard deviation (*SD*), median (*Me*), and quartile deviation (*Q*) were presented for both groups. In this context, the effect size was measured as the  $\eta^2$  effect size. In order to analyse the relationship between sociodemographic variables, work variables, COVID-19-related variables, pandemic burden, and psychological distress, linear regression was used separately for female and male university staff. In the first step, the single linear regressions were applied to calculate the univariate associations between analysed variables and depression, anxiety, and stress. It should be noted that categorical variables were recoded into dummy variables. In order to assess the predictors of psychological distress, statistical analyses using univariate regression were carried out.

## RESULTS

The analysis showed a difference between female and male university staff in marital status, education, university status, and working pattern (Tab. 2). Additionally, differences between the groups were found in fear of the negative consequences of being infected with COVID-19 and experiencing significant changes in private life during the last three months (Tab. 3).

However, it should be noted that the magnitudes of these differences were small.

Moreover, there was a statistically significant difference between female and male university staff regarding the number of weeks of remote work in the last three months and the number of weeks of remote work from 1 September 2020. Male university staff indicated more remote working weeks than female university staff. Additionally, female university staff demonstrated a higher level of anxiety and pandemic burden than male university staff (Tab. 4). However, it should be noted that the magnitudes of these differences were very small.

Regarding univariate regression analysis results, there was a negative relationship between the small city as work residence, marital status (informal relationship, married and divorced), and depression among female university employees. For male university staff, depression was negatively related to their married status, habilitation, and professor degree. Additionally, postdoctoral and professor degree was negatively associated with anxiety in both groups and stress in male university staff. The results showed a positive relationship between academic teacher status and stress among the female group. The other marital status was positively associated with stress in the male group.

Variable	Category	Female (n = 675)		Male (n = 314)		$\chi^2$	p	Cramér's V
		n	Percent	n	Percent			
Work residence	Small city (between 20,000 and 99,000 residents)	80	11.9%	27	8.6%	9.42	0.051	0.10
	Medium city (between 100,000 and 349,000 residents)	166	24.6%	103	32.8%			
	Large city (above 350,000 residents) without the capital city	175	25.9%	67	21.3%			
	Capital city	248	36.7%	115	36.6%			
	Other	6	0.9%	2	0.6%			
Marital status	Single	113	16.7%	55	17.5%	21.91	0.001	0.15
	Non-formal relationship	117	17.3%	47	15.0%			
	Married	374	55.4%	201	64.0%			
	Divorced	63	9.3%	8	2.5%			
	Widowed	6	0.9%	0	0.0%			
	Other	2	0.3%	3	1.0%			
Education	Secondary and post-secondary education	15	2.2%	7	2.2%	40.05	0.001	0.20
	Bachelor and master degree	351	52.0%	101	32.2%			
	PhD degree	178	26.4%	128	40.8%			
	Habilitation and professor degree	127	18.8%	78	24.8%			
	Other	4	0.6%	0	0.0%			
University status	Academic teacher	381	56.4%	250	79.6%	49.83	0.001	0.22
	Other academic staff	294	43.6%	64	20.4%			
Chronic disease	No	420	62.2%	203	64.6%	0.80	0.669	0.03
	Yes	225	33.3%	100	31.8%			
	Don't know	30	4.4%	11	3.5%			
Predominant working pattern from 01.09. to 31.12.2000	Stationary	181	26.8%	78	24.8%	6.25	0.100	0.08
	Hybrid	200	29.6%	75	23.9%			
	Remote	285	42.2%	158	50.3%			
	Other	9	1.3%	3	1.0%			
Working pattern from 01.01.2021 until today	Stationary	175	25.9%	73	23.2%	12.80	0.005	0.11
	Hybrid	223	33.0%	81	25.8%			
	Remote	271	40.1%	160	51.0%			
	Other	6	0.9%	0	0.0%			

Tab. 2. Difference between female and male university staff in sociodemographic variables

Additionally, chronic disease was positively related to depression and anxiety both among female and male university employees. Chronic disease was also positively associated with stress among the female group. Detailed results are shown in Tab. 5. The univariate regression analysis showed that fear of the negative consequences of being infected with COVID-19, the pandemic as a stressor, experiencing significant changes in private life, and pandemic burden were positively related to depression, anxiety, and stress both among female and male university staff. Additionally, both groups exhibited a negative relationship between age, number of work years, and psychological distress. For male university staff, the death of colleagues or students due to COVID-19 was positively associated with depression and stress. Moreover, there was a negative relationship between the number of weeks of remote work from 01 September 2020 and depression among male university staff. Detailed results are shown in Tab. 6.

## DISCUSSION

Studies have shown significant differences in sociodemographic variables between women and men in the group of university staff. Men, compared to women, had a higher level of education (i.e. they were more likely to obtain a Ph.D., habilitation, or professor degree) and achieved a higher professional status (i.e. more often than women, they were employed as academic teachers, and less often as other university staff). This is in line with the available data on the situation of women in the labour market in Poland, which shows that it is more difficult for them to get promoted (Rumińska-Zimny and Wejdner, 2023). Compared to female participants, more men were married. The male university staff also worked remotely longer.

The findings also revealed differences between men and women in terms of concerns about the consequences of COVID-19. Men had less severe concerns than women and were less likely to experience changes in their private lives.

Variable	Category	Female (n = 675)		Male (n = 314)		$\chi^2$	p	Cramér's V
		n	Percent	n	Percent			
Did you diagnose with COVID-19?	No	549	81.3%	260	82.8%	0.31	0.577	0.02
	Yes	126	18.7%	54	17.2%			
Did your colleague or student get diagnosed with COVID-19?	No	145	21.5%	67	21.3%	0.01	0.959	0.01
	Yes	530	78.5%	247	78.7%			
Did you have a close family member or friend diagnosed with COVID-19?	No	219	32.4%	103	32.8%	0.01	0.911	0.01
	Yes	456	67.6%	211	67.2%			
Did anyone in your family or friends die due to COVID-19?	No	485	71.9%	219	69.7%	0.46	0.496	0.02
	Yes	190	28.1%	95	30.3%			
Did any of your colleagues or students die due to COVID-19?	No	529	78.4%	241	76.8%	0.33	0.568	0.02
	Yes	146	21.6%	73	23.2%			
Are you afraid of the negative consequences of being infected with COVID-19 (whether you have the disease or not)?	No	141	20.9%	89	28.3%	6.67	0.010	0.08
	Yes	534	79.1%	225	71.7%			
Pandemic has been stressing you the most recently	No	360	53.3%	185	58.9%	2.70	0.100	0.05
	Yes	315	46.7%	129	41.1%			
During the last 3 months, did you experience any major changes in your private life?	No	403	59.7%	211	67.2%	5.11	0.024	0.07
	Yes	272	40.3%	103	32.8%			

Tab. 3. Difference between female and male university staff in coronavirus situation variables

Variables	Female (n = 675)				Male (n = 314)				U	z	p	$\eta^2$
	M	SD	Me	Q	M	SD	Me	Q				
<b>Age and work</b>												
Age	44.19	11.02	44.00	8.00	44.81	12.18	44.00	9.50	104893.00	-0.26	0.796	0.001
Number of work years <sup>#</sup>	19.94	16.68	20.00	8.50	19.40	12.78	19.00	10.50	103702.50	-0.43	0.669	0.001
Number of weeks of remote working in the last 3 months <sup>##</sup>	7.20	5.34	7.00	5.50	8.08	5.38	10.00	5.50	92248.00	-2.32	0.020	0.006
Number of weeks of remote work from 1 September 2020 <sup>###</sup>	17.49	13.42	17.00	13.00	19.71	14.03	20.00	12.50	88540.50	-2.13	0.033	0.005
<b>Depression, Anxiety and Stress Scale (DASS-21) and Pandemic Burden Scale</b>												
Depression	4.47	4.81	3.00	2.50	4.38	4.90	2.00	3.50	101,735.00	-1.02	0.307	0.001
Anxiety	3.25	3.94	2.00	2.50	2.75	3.64	1.00	2.00	96,199.00	-2.39	0.017	0.006
Stress	6.47	4.99	6.00	3.00	6.17	5.02	5.00	4.00	101,876.50	-0.98	0.326	0.001
Pandemic burden	3.17	0.94	3.33	0.67	2.87	0.97	2.89	0.83	86,344.50	-4.70	0.001	0.022

<sup>#</sup> There was 987 participants (674 female). <sup>##</sup> There was 966 participants (658 female). <sup>###</sup> There was 940 participants (635 female).

Tab. 4. Differences between female (n = 350) and male (n = 314) in age, work and psychological variables

The respondents also differed on the pandemic burden – women felt it much more strongly than men. This situation may have been associated with a more significant pandemic burden on women needing organised childcare, as indicated by previous studies (Avery et al., 2021; Zamarro and Prados, 2021). A pandemic burden can result in increased anxiety and concern about the negative consequences of being infected with COVID-19. However, anxiety as a trait is very common among women in the general population (Hintze et al., 2023).

Our study showed that women, compared to men, had elevated anxiety levels assessed by the DASS-21 scale. The differences are consistent with research showing higher levels of anxiety in women working at universities compared to men (Zapata-Garibay et al., 2021). In contrast, women and men did not differ in the severity of depression and stress as assessed by the DASS-21 scale. Since few studies have focused on this professional group, the results can only

be compared to those obtained in the general populations. The lack of differences in the severity of depression in terms of gender was reported by Chinese researchers. However, in their studies, there were no differences in the level of anxiety as well (Qi et al., 2021). Other researchers, who also used the DASS-21 scale, obtained slightly different results. They found no significant differences between men and women in the levels of depression and anxiety, but women had significantly higher scores in the stress subscale compared to men (Stanton et al., 2020). The results are different from other studies, in which higher levels of mental disorders (symptoms of anxiety, stress, depression, and post-traumatic stress disorder) were noted in women compared to men (Moghanibashi-Mansourieh, 2020; Rossi et al., 2020). Pre-pandemic research found that women were twice as likely to develop anxiety disorders, panic, and mental health crises as men (McLean et al., 2011). The female gender is also associated with a higher risk of developing emotional



Variable	Category	Depression				Anxiety				Stress			
		Female (n = 675)		Male (n = 314)		Female (n = 675)		Male (n = 314)		Female (n = 675)		Male (n = 314)	
		B	SE	B	SE	B	SE	B	SE	B	SE	B	SE
Work residence	Small city	-1.28*	0.62	0.72	1.05	-0.66	0.51	0.75	0.78	-0.89	0.64	1.68	1.07
	Medium city	0.02	0.48	-0.33	0.67	0.56	0.39	0.20	0.50	0.38	0.50	0.52	0.68
	Large city	-0.50	0.47	-0.92	0.75	-0.15	0.39	0.12	0.56	-0.18	0.49	-0.18	0.77
	Other	0.93	1.98	0.88	3.50	0.27	1.63	0.92	2.61	-1.37	2.06	1.62	3.58
	Capital city – reference												
Marital status	Non-formal relationship	-2.02***	0.63	-0.28	0.97	0.15	0.52	-0.09	0.72	-0.12	0.66	0.91	0.99
	Married	-2.22***	0.51	-1.51*	0.74	-0.11	0.42	-0.89	0.55	-0.26	0.54	-0.65	0.76
	Divorced	-1.80*	0.75	0.40	1.84	-0.53	0.62	-0.20	1.38	-0.88	0.79	2.30	1.88
	Widowed	-0.38	1.99	-	-	-1.02	1.65	-	-	-1.72	2.09	-	-
	Other	2.29	3.39	3.65	2.88	-1.85	2.82	0.67	2.16	4.28	3.57	6.01*	2.94
	Single – reference												
Education	Secondary and post-secondary education	-0.59	1.27	-0.94	1.88	0.72	1.04	0.69	1.41	0.71	1.32	0.63	1.93
	PhD degree	0.17	0.44	-0.42	0.64	-0.27	0.36	0.40	0.48	0.67	0.46	0.62	0.66
	Habilitation and professor degree	-0.76	0.50	-2.63***	0.72	-0.87*	0.41	-1.27*	0.54	-0.46	0.52	-1.88*	0.74
	Other	-0.84	2.42	-	-	-0.73	1.98	-	-	0.39	2.51	-	-
	Bachelor and master degree – reference												
University status	Academic teacher	0.21	0.37	-1.23	0.68	0.01	0.31	0.09	0.51	0.84*	0.39	-0.60	0.70
	Other academic staff – reference												
Chronic disease	Yes	2.29***	0.38	1.08	0.59	1.98***	0.31	0.91*	0.44	2.15***	0.40	1.05	0.61
	Don't know	4.14***	0.88	5.61***	1.48	3.00***	0.72	2.45*	1.12	4.38***	0.91	2.91	1.54
	No – reference												
Predominant working pattern from 01.09.2000 to 31.12.2000	Hybrid	-0.44	0.49	-0.13	0.79	-0.32	0.40	0.76	0.59	-0.36	0.51	0.39	0.81
	Remote	0.05	0.46	-1.06	0.68	-0.34	0.37	0.39	0.51	0.51	0.47	-0.72	0.69
	Other	-1.37	1.64	-2.97	2.88	-0.39	1.35	-0.71	2.15	0.99	1.70	-2.79	2.95
	Stationary – reference												
Working pattern from 01.01.2021 until today	Hybrid	-0.23	0.49	-0.48	0.79	0.11	0.40	0.40	0.59	0.33	0.50	0.11	0.81
	Remote	0.36	0.47	-1.21	0.69	-0.14	0.38	0.16	0.52	0.60	0.48	-0.32	0.71
	Other	-1.24	2.00	-	-	1.24	1.64	-	-	1.56	2.07	-	-
	Stationary – reference												

\*\*\*  $p < 0.001$ . \*\*  $p < 0.01$ . \*  $p < 0.05$ .

Tab. 5. Univariate regression analysis results for depression, anxiety, stress among female and male university staff – sociodemographic variables

disorders (Rosenfield and Mouzon, 2013). However, despite similar levels of depression and stress in women and men, different models of predictors of psychological distress were obtained for them. In men, essential predictors of depression are academic degree, marital status, and chronic disease. Married men with a higher academic degree reported a lower severity of depression. These results are consistent with those obtained by other researchers who have shown that living alone is associated with worsening depression during the pandemic (Qi et al., 2021). People living alone may receive less social support, which promotes increased levels of depression and anxiety (Gariépy et al., 2016). The importance of social support in the group of university staff is also emphasized by published research, which shows that the ability to talk to someone and to be heard is an essential protective factor for mental health (Serralta et al., 2020).

The prevalence of chronic disease in men was associated with higher levels of depression and a higher academic degree with a lower one. Better education ensures a more substantial professional position and greater stability of employment. These results correspond to the study that noted that lower levels of education measured in years of education were associated with higher levels of depression (Stan-ton et al., 2020).

In women, the predictors of depression include living in a smaller town, being in a relationship (married or informal), and chronic illness. A lower severity of depression was associated with living in a small town and being in a relationship, and a greater severity of symptoms was linked to chronic disease. In addition, relationships provide support that could be easier to retrieve in smaller societies like smaller towns. On the other hand, as academic centres are

Variable	Depression				Anxiety				Stress			
	Female (n = 675)		Male (n = 314)		Female (n = 675)		Male (n = 314)		Female (n = 675)		Male (n = 314)	
	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE
<b>Coronavirus situation variables</b>												
Did you diagnose with COVID-19?	0.20	0.48	0.39	0.73	0.41	0.39	0.29	0.55	0.52	0.49	1.16	0.75
Did your colleague or student get diagnosed with COVID-19? (0 – No; 1 – Yes)	0.58	0.45	-0.20	0.68	0.22	0.37	0.44	0.50	0.60	0.47	-0.04	0.69
Did you have a close family member or friend diagnosed with COVID-19? (0 – No; 1 – Yes)	-0.45	0.40	0.60	0.59	0.08	0.32	0.07	0.44	0.42	0.41	0.59	0.60
Did anyone in your family or friends die due to COVID-19? (0 – No; 1 – Yes)	0.61	0.41	0.24	0.60	0.07	0.34	0.24	0.45	0.12	0.43	-0.01	0.62
Did any of your colleagues or students die due to COVID-19? (0 – No; 1 – Yes)	0.28	0.45	<b>1.30*</b>	0.65	0.44	0.37	0.80	0.49	0.59	0.47	<b>1.48*</b>	0.67
Are you afraid of the negative consequences of being infected with COVID-19 (whether you have the disease or not)? (0 – No; 1 – Yes)	<b>1.33**</b>	0.45	<b>1.35*</b>	0.61	<b>1.21**</b>	0.37	<b>1.13*</b>	0.45	<b>1.61***</b>	0.47	<b>1.80**</b>	0.62
Pandemic has been stressing you the most recently (0 – No; 1 – Yes)	<b>0.92*</b>	0.37	<b>2.02***</b>	0.55	<b>0.70*</b>	0.30	<b>1.62***</b>	0.41	<b>1.30***</b>	0.38	<b>1.90***</b>	0.57
During the last 3 months, did you experience any major changes in your private life? (0 – No; 1 – Yes)	<b>2.58***</b>	0.36	<b>2.68***</b>	0.57	<b>2.10***</b>	0.30	<b>1.40**</b>	0.43	<b>2.82***</b>	0.38	<b>3.24***</b>	0.58
<b>Age and work</b>												
Age	<b>-0.05**</b>	0.02	<b>-0.07***</b>	0.02	<b>-0.05***</b>	0.01	<b>-0.05**</b>	0.02	<b>-0.06***</b>	0.02	<b>-0.07**</b>	0.02
Number of work years <sup>#</sup>	<b>-0.02*</b>	0.01	<b>-0.06*</b>	0.02	<b>-0.02*</b>	0.01	<b>-0.04*</b>	0.02	<b>-0.02*</b>	0.01	<b>-0.05*</b>	0.02
Number of weeks of remote working in the last 3 months <sup>#</sup>	0.01	0.04	-0.06	0.05	-0.01	0.03	0.02	0.04	0.043	0.037	-0.040	0.053
Number of weeks of remote work from 1 September 2020 <sup>###</sup>	0.01	0.01	<b>-0.04*</b>	0.02	-0.01	0.01	-0.01	0.01	0.02	0.01	-0.03	0.02
<b>Pandemic burden</b>												
Pandemic burden	<b>1.68***</b>	0.19	<b>2.15***</b>	0.26	<b>1.18***</b>	0.15	<b>1.59***</b>	0.19	<b>2.17***</b>	0.19	<b>2.49***</b>	0.26

\*\*\*  $p < 0.001$ . \*\*  $p < 0.01$ . \*  $p < 0.05$ . # There was 987 participants (674 female). ## There was 966 participants (658 female). ### There was 940 participants (635 female).

Tab. 6. Univariate regression analysis results for depression, anxiety, stress among female and male university staff – COVID-19-related and mental health variables

primarily located in large cities, living in a small town is associated with commuting, which could be stressful (Ali et al., 2021). Therefore, one can assume that remote learning decreased some depression and stress-related factors in commuting academic staff.

Regardless of gender, chronic disease was associated with greater severity of depression. It could be due to several factors: knowledge about the more severe course of COVID-19 in people with coexisting diseases, limited access to health care, and the specifics nature of the chronic diseases. In the cited studies, chronic diseases were associated with higher anxiety, stress, and depression levels for both genders (World Health Organization, 2020).

Similar factors were shown to predict anxiety levels in female and male university staff. A higher academic degree lowered the level of anxiety, and while chronic disease increased it. Women's stress levels were associated with employment as an academic teacher and suffering from chronic disease. In men, stress level was associated with marital status and academic degrees. The higher the academic degree, the lower the stress they experienced, and the lack of marriage or informal relationships increased stress levels during the pandemic. In women, psychological distress

was affected by pandemic-related factors, i.e., the pandemic burden and the fear of the negative consequences of COVID-19. Moreover, the more changes in their private lives they experience, the higher their depression, anxiety, and stress levels. In addition to the same factors as in women, the experience of the death of a loved one caused higher levels of stress and depression in male participants. In both groups, it was noted that younger people with fewer years of work experienced more severe symptoms of depression, anxiety, and stress. These results are consistent with both Polish and international studies involving the general population and school teachers, which indicated that younger people are more exposed to the pandemic's negative consequences and the development of mental disorders (Gambin et al., 2023; Qiu et al., 2020).

To summarise, women had higher levels of anxiety compared to men during the COVID-19 pandemic. The most important risk factors among university staff, regardless of gender, included chronic disease and younger age. On the other hand, protective factors included a higher level of education (academic degree) and being in a relationship (married or informal). For women living in a small town, employing them as academic teachers was an additional

protective factor. For men, a significant risk factor was the death of a familiar person due to COVID-19.

The second part of the article will present in-depth analyses of predictors of distress in university staff by gender, a discussion of the possible practical implications of the obtained results, and the study's limitations.

### Conflict of interest

*The authors do not report any financial or personal connections with other persons or organizations which might negatively affect the contents of this publication and/or claim authorship rights to this publication.*

### Author contributions

*Original concept of study: BH, MWP, MG. Collection, recording and/or compilation of data: BH, MG. Analysis and interpretation of data: BH, MWP, MG, AC. Writing of manuscript: BH, MWP. Critical review of manuscript: MG, AC. Final approval of manuscript: BH.*

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