MENTAL HEALTH
DURING THE THIRD WAVE
OF THE PANDEMIC IN POLAND*

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Summary. The study aimed to determine the severity of mental health problems during Poland's third wave of COVID-19. The study included 574 respondents. The survey constructed for the purposes of the study comprised a demographic component, the Patient Health Questionnaire-4 (PHQ-4), and the General Health Questionnaire (GHQ-12). Analyses were performed using the Mann–Whitney U test. The results indicated that women experienced more severe mental health problems than men. Women were also higher in depression and anxiety. Further analyses revealed that respondents with secondary or lower education had more mental health problems than individuals with higher education. Respondents with secondary or lower education had higher levels of depression and anxiety as well. When analyzing the remaining variables, the author found that the level of mental health problems was higher in students compared to working people. The obtained data can be used to mitigate the negative effects of the pandemic.
Key words: pandemic, COVID-19, mental health, anxiety, depression

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Introduction

In March 2020, the World Health Organization (WHO) declared a pandemic due to a high SARS-CoV-2 infection incidence rate (Ghebreyesus, 2020). Apart from the widespread threat to life and health, the pandemic caused significant socio-economic changes. The epidemic situation affected the functioning of millions of people all over the world. The increasing number of infections and deaths caused by COVID-19 led to the introduction of a sanitary regime and restrictions on interpersonal contact. People were informed about the need to maintain social distancing and limit interactions with others (CDC, 2020; Portal Gov.pl, 2020; WHO, 2020). Recommendations on washing hands, disinfection, and other safety behaviors may have influenced the level of pandemic-related anxiety (Deakon, Maack, 2008; Engelhard et al., 2015). During the successive waves of COVID-19, the number of coronavirus-infected people rapidly grew.

The first wave started in the spring of 2020, the second one in the fall of that year, and the third one in the spring of 2021. At the end of March and at the beginning of April, there was a great increase in the number of cases in Poland. For this reason, a lockdown was introduced from 20 March to 9 April 2021, with a list of new restrictions. Facilities such as hotels and shopping malls had to suspend their activities. Experts were unable to determine the scale of the negative outcomes of the pandemic for the country's economy. There were contradictory reports concerning the duration of the pandemic and its consequences for companies. Sectors dependent on social contacts, such as tourism, the event business, restaurants, and transport, slowed down their activities.

The pandemic posed a threat to the physical and mental health of the entire society. Studies have confirmed the negative impact of the pandemic on mental health (Bao et al., 2020; Cao et al., 2020; Cui et al., 2022; Gambin et al., 2020; Xiang et al., 2020). Long-term distress increased the likelihood of anxiety and depressive symptoms (Lee, Jobe, Mathis, 2020; Petzold et al., 2020; Solomou, Constantinidou, 2020). Unstable personal, professional, and economic situation led to frustration and emotional exhaustion in many people (Bressington et al., 2020; Sampei et al., 2022).

Research conducted during the first and second waves of the pandemic in Poland (Gambin et al., 2020) showed increased levels of both depressive symptoms and generalized anxiety disorder. The predominant mood among the Poles was anxiety and uncertainty associated with the spread of the pandemic. Research results from other countries (Stanton et al., 2020) highlight the link between mental health and substance use frequency. The level of depressive symptoms, anxiety, and distress was associated with a stronger tendency to smoke cigarettes and drink alcohol.

An additional problem during the successive waves of the pandemic was misinformation about COVID-19 in the media – the spread of numerous fake

news, rumors, and conspiracy theories (Demczuk, 2020; Maj, Skarżyńska, 2020; Roozenbeek et al., 2020; Wróblewski, Meler, Afeltowicz, 2020; Amol, Bapaye, 2021; Biancovilli, Makszin, Jurberg, 2021). Research showed that individuals who shared misinformation with other social media users experienced a higher level of anxiety (Verma et al., 2022).

The pandemic became a threat to many social and occupational groups. Initially, the groups most at risk of coronavirus infection were older adults and chronically ill people. Research conducted in Poland among individuals aged 55 and above suggested that anxiety and depressive symptoms were linked with loneliness, fatigue over the situation, and the need for a lifestyle change (Gambin et al., 2020). Mental disorders appeared in previously healthy individuals and intensified in psychiatric patients (Asmundson et al., 2020; Miller et al., 2022). The negative consequences of the pandemic also affected individuals diagnosed with COVID-19. This may have stemmed from the threat the disease posed to their health and life. Research conducted among this group revealed a relationship between the fear of the effects of infection and depression, perceived lack of social support, and suicidal tendencies (Lee, Jobe, Mathis, 2020). A positive result of the COVID-19 test meant the necessity of staying in isolation, and for people from the infected person's closest circle it meant quarantine. Research showed that being in quarantine had a negative effect on sleep quality (Casagrande et al., 2020) and increased the level of anxiety (Kołodziejczyk et al., 2021).

It should be noted that, of all occupational groups, it was healthcare personnel who put their health and lives at risk the most during the fight against the pandemic. They provided medical assistance to infected people in conditions of high physical and mental strain. Studies indicate particularly severe symptoms of anxiety and depression in this profession (Maciaszek et al., 2020; Xiao et al., 2020; Tiete et al., 2021).

In this context, it should be stressed that people seeking medical help, including psychiatric and psychotherapeutic assistance, had restricted access to such services. Due to the increase in COVID-19 incidence, a considerable number of healthcare workers, including psychological and psychiatric personnel, were isolated or quarantined. The implementation of remote psychological and psychiatric assistance only partly solved this problem.

Aim and hypothesis

The study aimed to determine the level of mental health problems in Poland during the third wave of the pandemic. The fundamental aim was to verify if the sociodemographic variables (gender, age, education, and employment status) differentiated the levels of general mental health, anxiety, and depression. I formulated four research hypotheses:

Hypothesis 1: Women show a higher level of mental health disorder symptoms than men.

Hypothesis 2: Individuals aged 18–30 years show a higher level of mental health disorder symptoms than individuals over 30 years of age.

Hypothesis 3: Participants with secondary or lower education show a higher level of mental health disorder symptoms than those with higher education.

Hypothesis 4: Students show a higher level of mental health disorder symptoms than working individuals.

The results of other studies conducted during the COVID-19 pandemic confirm the existence of relationships between the variables included in the hypotheses. They indicate that the reported level of mental health problems is higher in women than in men (Rossi et al., 2020; Wang et al., 2020; Broche-Pérez et al., 2022), higher in individuals below 30 years of age than in older ones (Huang, Zhao, 2020; Liu et al., 2020b; Qiu et al., 2020), and higher in students than in working people (Debowska et al., 2020; Son et al., 2020; Wieczorek et al., 2021). It should be stressed that research results are not clear on the education level variable. According to some authors (Paulino et al., 2020; Wang et al., 2020; Coley, Baum, 2021), higher levels of depression and anxiety were found in subjects with secondary or lower education, while according to others they were higher in subjects with higher education (CBOS, 2020; Qiu et al., 2020).

It should also be noted that most of the research reports so far have discussed the state of mental health in Poland in an earlier stage of the COVID-19 pandemic. Moreover, results may differ depending on the development of the epidemic situation, which was unstable during the research and involved a risk of another wave of the pandemic.

Methods

The study was conducted on a nationwide sample of 574 subjects (see Table 1). The sample consisted of 382 women (66.6%) and 192 men (33.4%). There were 337 participants aged 30 years or younger (58.7%), 160 participants aged 31–45 (27.9%), 68 participants aged 46–65 (11.8%), and 9 subjects aged over 65 (1.6%); 46.5% of the respondents had secondary or lower education, while 53.5% had higher education. The overwhelming majority of people with secondary or lower education were in the under-30 age group (45.1%), while the majority of respondents with higher education were in the 31–45 age group (68.1%). More than half of the respondents (57.0%) were working people, and the second largest group were students (34.3%). While 20.2% of the respondents were in quarantine and 11.5% were in isolation, the majority (68.3%) were neither quarantined nor isolated.

Table 1. Characteristics of the sample (*N* = 574)

Demographic variables		*N*	%
Gender	woman	382	66.6
	man	192	33.4
Age	18–30 years	337	58.7
	31–45 years	160	27.9
	46–65 years	68	11.8
	over 65 years	9	1.6
Education	incomplete or none	5	0.9
	elementary	15	2.6
	lower secondary	9	1.6
	basic vocational	26	4.5
	upper secondary	212	36.9
	higher	307	53.5
Employment status	school or university student	197	34.3
	unemployed	38	6.6
	old-age or disability pensioner	12	2.1
	working	327	57.0
Quarantine or isolation	I have not been in quarantine/isolation	392	68.3
	I have been in isolation	66	11.5
	I have been in quarantine	116	20.2

Note. N = number of participants.

The study was conducted during the third wave of the SARS-CoV-2 coronavirus pandemic, between 24 March and 8 April 2021. Because of the restrictions on social contact, participants were recruited using snowball sampling. The link to the questionnaire was disseminated through social media – mainly Facebook – and via email, with a request to complete an anonymous form and encourage others to complete the survey as well. Respondents were informed about the purpose and procedure of the study. They gave informed consent to take part in the research.

Measures

The Patient Health Questionnaire-4 (PHQ-4) consists of two subscales, measuring depression (PHQ-2) and anxiety (GAD-2). Respondents give their answers on a 4-point Likert scale. The questionnaire was psychometrically developed and tested (Kroenke et al., 2009). Measurement reliability was assessed using Cronbach's *alpha*, which was high both for anxiety (α = .82) and for depression (α = .76) (see Table 2).

The General Health Questionnaire (GHQ-12) (Goldberg, 1976; Goldberg, Williams, 1988) measures the mental health of adults. It consists of 12 questions, based on which a total score is computed. The higher the score, the higher the level of mental disorder symptoms. The questionnaire has good psychometric properties (Wiliams et al., 2001). For the purposes of the study, I also verified the internal consistency of the measure by computing Cronbach's *alpha* coefficient. The reliability coefficient (α = .91) turned out to be high (see Table 2).

The author-designed survey used in the study was constructed using Google Forms®. It included a sociodemographic section, concerning gender, age, education, and employment status. The remaining survey items, concerning marital status, pandemic-related fears associated with being in quarantine/isolation, the respondents' experience of violence, and the problem of the infodemic will be analyzed in a separate report.

Results

Descriptive statistics and correlations between the variables are presented in Table 2. The normality of distribution was tested using the Kolmogorov–Smirnov test. The distribution of all the investigated variables differed significantly from normal, which is why I used nonparametric Spearman's rho to test the correlations. The correlations between anxiety, depression, and general mental health were statistically significant. The higher the levels of anxiety and depression, the higher the severity of participants' mental health problems.

Table 2. Descriptive statistics and correlations between the variables

	Variable	*M*	*SD*	K–S	*p*	1	2	3	α
1	Anxiety (PHQ-2)	2.05	1.78	.21	< .001	1			.82
2	Depression (GAD-2)	1.89	1.74	.17	< .001	.76***	1		.76
3	General mental health (GHQ-12)	14.25	6.81	.15	< .001	.66***	.75***	1	.91

Note. K–S = the values of the Kolmogorov–Smirnov normality test; *** $p < .001$; Spearman's *rho* correlations were reported; α = Cronbach's *alpha*.

To check if sociodemographic variables (gender, age, education, and employment status) differentiated the level of general mental health (GHQ-12) and the levels of anxiety and depression (PHQ-4) and to test each of the hypotheses, I used tests of the significance of differences. The Kolmogorov–Smirnov test showed that

the distribution of general mental health scores (GHQ-12) and the distributions of anxiety and depression scores (PHQ-4) in all groups distinguished based on various levels of sociodemographic variables differed significantly from the normal distribution. I therefore decided to use nonparametric test – the Mann–Whitney U test.

First, I tested if there were differences in the level of general mental health and in the levels of anxiety and depression depending on gender. The first hypothesis was that women had a higher level of mental health problems than men. The results of the Mann–Whitney U test indicated that women and men differed significantly in the level of general mental health ($U = 29236.50$, $p < .001$). Women scored higher on general mental health ($Mdn = 13.00$, $M = 15.16$, $SD = 7.15$), which means they showed more severe mental health problems than men ($Mdn = 11.00$, $M = 12.47$, $SD = 5.68$). Statistically significant differences were also found in anxiety level ($U = 30846.00$, $p < .001$), with women being higher in anxiety ($Mdn = 2.00$, $M = 2.21$, $SD = 1.78$) than men ($Mdn = 1.00$, $M = 1.72$, $SD = 1.74$). The results were very similar for depression – the Mann–Whitney U test revealed statistically significant differences between women and men ($U = 30581.00$, $p < .001$). The female participants had a higher level of depression ($Mdn = 2.00$, $M = 2.07$, $SD = 1.77$) than male participants ($Mdn = 1.00$, $M = 1.54$, $SD = 1.65$).

The next variable analyzed was age. The second hypothesis postulated that individuals aged 18–30 years had a higher level of mental health problems than individuals over 30 years of age. Because few subjects were over 45 years of age, I analyzed respondents aged 31–45, 46–65, and over 65 as one group. As a result, two age groups were compared: respondents aged 18–30 vs. respondents aged over 30. The Mann–Whitney U test showed significant differences between these groups in the level of general mental health ($U = 33829.00$, $p = .001$). Younger respondents (aged 18–30) had a higher level of mental health problems ($Mdn = 13.00$, $M = 15.03$, $SD = 7.06$) than respondents over the age of 30 ($Mdn = 11.00$, $M = 13.14$, $SD = 6.28$). In the case of anxiety level, significant differences were also found ($U = 35169.00$, $p = .008$). Younger individuals scored significantly higher on anxiety ($Mdn = 2.00$, $M = 2.20$, $M_{rank1} = 304.06$, $SD = 1.77$) than those from the older age group ($Mdn = 2.00$, $M = 1.84$, $M_{rank2} = 267.39$, $SD = 1.78$). The results were very similar for depression level ($U = 31324.00$, $p < .001$), with respondents from the 18–30 age group scoring higher ($Mdn = 2.00$, $M = 2.16$, $SD = 1.77$) than those under 30 ($Mdn = 1.00$, $M = 1.51$, $SD = 1.64$).

Next, I analyzed if education level differentiated the scores on the dependent variables. The third hypothesis predicted that respondents with secondary or lower education would show a higher level of mental health problems than those with higher education. Again, due to the highly significant disproportion between the groups in terms of size and the relatively small percentage of respondents with education other than secondary or higher, I decided to classify individuals without education and those with elementary, lower secondary, and upper secondary education into one group (secondary or lower education). Respondents from this

group were compared to subjects with higher education. The Mann–Whitney U test revealed significant differences in general mental health (U = 37469.00, p = .047). Respondents with secondary or lower education had more mental health problems (Mdn = 13.00, M = 14.89, M_{rank1} = 303.71, SD = 7.15) than those with higher education (Mdn = 11.50, M = 13.70, M_{rank2} = 276.15, SD = 6.46). The situation was similar in the case of anxiety level (U = 36372.00, p = .010); subjects with secondary or lower education were higher in anxiety (Mdn = 2.00, M = 2.29, M_{rank1} = 307.79, SD = 1.91) than respondents with higher education (Mdn = 2.00, M = 1.84, M_{rank2} = 272.59, SD = 1.63). The education variable significantly differentiated the level of depression, too (U = 35597.00, p = .003) – the respondents with secondary or lower education had a higher level of depression (Mdn = 2.00, M = 2.13, M_{rank1} = 310.67, SD = 1.83) than those with higher education (Mdn = 2.00, M = 1.68, M_{rank2} = 270.07, SD = 1.64).

The last of the analyzed sociodemographic variables was employment status. The fourth hypothesis suggested that students showed a higher level of mental health disorder symptoms than working individuals. The employment status variable was originally considered in terms of four categories. However, due to the very small size of the groups of unemployed individuals (38 respondents) and disability pensioners and retirees (12 respondents), these subjects were excluded from the analysis, and only the largest two groups in the sample were compared: working people and students. The Mann–Whitney U test revealed significant differences between the groups in the level of general mental health (U = 27860.50, p = .006). Students were higher in mental health problems (Mdn = 14.00, M = 15.43, M_{rank1} = 287.58, SD = 7.44) than working people (Mdn = 11.50, M = 13.38, M_{rank2} = 249.93, SD = 6.17). Likewise, the level of anxiety (U = 28418.00, p = .013) was significantly higher in students (Mdn = 2.00, M = 2.30, M_{rank2} = 284.75, SD = 1.78) than in working people (Mdn = 2.00, M = 1.92, M_{rank1} = 251.62, SD = 1.73). Depression level was also significantly differentiated by employment status (U = 25604.00, p < .001). Students were characterized by a higher level of depression (Mdn = 2.00, M = 2.29, M_{rank2} = 299.03, SD = 1.81) than respondents who had jobs (Mdn = 1.00, M = 1.63, M_{rank1} = 243.09, SD = 1.58).

Discussion of the results

The study aimed to determine the state of Polish people's mental health during the third wave of the SARS-CoV-2 coronavirus pandemic. Its results supported all research hypotheses, showing that the sociodemographic variables differentiated the level of general mental health and the levels of anxiety and depression. A detailed analysis of the results indicates that women had a higher level of mental health problems, anxiety, and depression compared to men, which supports the first hypothesis. The above data are consistent with other empirical research reports, which demonstrated that women experienced the negative psychological consequences of coronavirus infection risk more often than men. They exhibited higher levels of stress, anxiety, and depression (Wang et al., 2020) and a medium or high

fear of COVID-19 (Broche-Pérez et al., 2022). Moreover, women showed increased symptoms of adaptation disorders (Petzold et al., 2020; Rossi et al., 2020; Solomou, Constantinidou, 2020), and during the outbreak of the pandemic they more often reported posttraumatic stress disorder symptoms (Liu et al., 2020a). They exhibited excessive agitation, negative cognitive changes, and changes in mood. They also felt a stronger fear of COVID-19 infection (Rossi et al., 2020).

The obtained data indicate that younger people (aged 18–30) had more severe mental health problems and higher levels of anxiety and depression than individuals over the age of 30. This means the second hypothesis was supported. These results are consistent with the findings of previous studies, indicating a higher level of depression and anxiety symptoms during the pandemic among individuals under the age of 35 compared to older age groups (Huang, Zhao, 2020; Liu et al., 2020b; Qiu et al., 2020). Young people also experienced stronger distress compared to the time before the pandemic (Shanahan et al., 2022). Research conducted in Poland (Gambin et al., 2020) revealed the highest levels of depression and generalized anxiety disorder as well as the occurrence of suicidal thoughts in the group aged 18–34 years. The above research showed that the level of these symptoms among young people was related to the restrictions introduced, the limitations of freedom, the experience of boredom, difficult family relationships, loneliness, and fatigue.

The results of the present study indicate that people with secondary of lower education experienced more severe mental health problems and had higher levels of anxiety and depression than individuals with higher education, which supports the third hypothesis. The studies conducted to date did not clearly identify the type of relationship between education and mental health. According to some authors (Paulino et al., 2020; Wang et al., 2020; Coley, Baum, 2021; Han et al., 2022), a lower level of education was associated with higher depression and anxiety during the pandemic. Other studies suggest the opposite relationship (CBOS, 2020; Qiu et al., 2020), indicating that people with higher education are more prone to mental stress than those with secondary of lower education. The ambiguity of the presented research results may stem from the different effects of the pandemic on people with different levels of education. The data obtained in the present study may indicate that individuals with secondary of lower education had smaller psychological resources for coping with the changes caused by COVID-19. The research conducted during the SARS pandemic show that less well-educated people less often complied with the safety recommendations introduced to prevent infection (Leung et al., 2003). They may, therefore, have been more exposed the negative consequences associated with coronavirus, adopting a less critical attitude and relying on an inaccurate assessment of pandemic-related risk.

The results of this study results indicate that students had a higher level of mental health problems than working people, which confirms that the fourth hypothesis was correct. The existing studies demonstrate that during the pandemic

there was no mental health deterioration among those individuals who did not experience significant changes in their job situation, had a fixed salary, and worked remotely during the lockdown (Gambin et al., 2020; Ueda et al., 2020). A different tendency is suggested by research conducted among students in Poland, highlighting the change in their coronavirus-related attitudes and a deterioration of their mental condition (Długosz, 2021). Almost three months after the introduction of social distancing there was a decrease in life satisfaction and an increase in stress symptoms. Other studies revealed a similar tendency (Debowska et al., 2020), suggesting that students aged 18–24 experienced more symptoms of mental disorders. They showed symptoms of depression, anxiety, and suicidal inclinations to a greater degree than students in the older age group. Other research (Son et al., 2020) identified the stressors that contributed to increased levels of stress, anxiety, and depressive mood among students. It concerned a fear for one's own and one's family's health, concentration problems, and sleep disorders. Students less often maintained social contacts and showed anxiety about their academic achievements. Based on the results, it should be noted that the pandemic caused many changes in areas such as the system of education and learning, which students had to adapt to. Remote or hybrid learning was introduced, together with social distancing and isolation regulations. Due to the freezing of the economy, some extramural students lost their jobs, which were often the only source of their income.

The presented research has certain limitations. Due to the epidemic situation, participants were recruited using snowball sampling, via email and through social media. It should be noted, however, that some people rarely use email and have no social media accounts, which may have contributed to the small number of older adults in the sample. Moreover, there were more women than men among the respondents. When analyzing the results, it is necessary to consider the characteristics of the sample and exercise special interpretative caution. Further studies should include larger and more representative samples.

Conclusions

Based on the material collected during the research and based on the analyses, I determined the level of mental health problems in Poland during the SARS-CoV-2 coronavirus pandemic. The widespread pandemic threat to life and health and the negative socioeconomic effects may increase the incidence of anxiety and depressive disorders in society. In the event of further pandemic waves, studies should be conducted that may help explain the psychosocial outcomes of COVID-19. This will make it possible to take proper action to support specific risk groups – particularly, as the study shows, the groups of women, students, people with secondary education, and people under the age of 30. Psychological and psychiatric assistance should be adjusted to their needs to alleviate the negative effects of the pandemic. The actions taken should focus on preventing mental health problems

and minimizing anxiety and depression symptoms. It is especially significant to promote health behaviors that enable adaptation to pandemic-induced changes. What is also recommended is education for effective stress coping, limiting the reading and watching of pandemic-related news, maintaining a daily schedule that includes routine physical activity, and promoting safe means of transport.

To sum up, people with mental health problems should be provided with proper access to professional psychological and psychiatric care, not only in mental health outpatient clinics and inpatient psychiatric care but also, if necessary, in a remote form.

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ZDROWIE PSYCHICZNE PODCZAS III FALI PANDEMII W POLSCE

Streszczenie. Celem badania było określenie nasilenia problemów dotyczących zdrowia psychicznego podczas III fali COVID-19 w Polsce. W badaniu wzięło udział 574 respondentów. Ankieta skonstruowana na potrzeby badań składała się z części demograficznej, Kwestionariusza Zdrowia Pacjenta-4 (PHQ-4) oraz Kwestionariusza Ogólnego Stanu Zdrowia GHQ-12. Analizy przeprowadzono, wykorzystując test *U* Manna–Whitneya. Wyniki badań wskazują, że kobiety mają większe nasilenie problemów ze zdrowiem psychicznym niż mężczyźni. Ponadto kobiety wykazują większe nasilenie depresji i lęku. Dokonując kolejnych analiz,

stwierdzono, że respondenci z wykształceniem co najwyżej średnim mają więcej problemów ze zdrowiem psychicznym niż osoby z wykształceniem wyższym. Badani z wykształceniem co najwyżej średnim mają również większe nasilenie depresji i lęku. Analizując pozostałe zmienne, ustalono, że większe nasilenie problemów ze zdrowiem psychicznym mają studenci w porównaniu do osób pracujących. Uzyskane dane można wykorzystać w działaniach łagodzących negatywne skutki pandemii.

Słowa kluczowe: pandemia, COVID-19, zdrowie psychiczne, lęk, depresja