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"Hope for good luck" during the COVID-19 pandemic

„Nadzieja na powodzenie" w czasie pandemii COVID-19

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Abstract

Introduction: The situation with COVID-19 is unexpected and unpredictable, and the consequences are tragic. The number of sick and dead has increased globally, including in Ukraine, and it is reasonable to assume that this will have a certain effect on the mental state of people, including their level of anxiety. Therefore, this study focuses on measuring the level of state anxiety and determining its relationship with the perception of various aspects of COVID-19 by the population of Ukraine.

Material and methods: The survey was conducted by telephonic interview. Respondents were recruited randomly in the period from 17.04 to 22.05.2020. The sample consists of 412 people from all over Ukraine. State anxiety, which is dynamic and reflects the level of anxiety on the State Anxiety Scale from The State-Trait Anxiety Inventory (STAI) at a particular time, was studied.

Results: Differences have been traced in responses of male and female respondents, where this indicator was higher among females. People tend to have a different subjective attitude towards the likelihood of finding themselves in the same situation, which for objective reasons is relatively equal for everyone who is in the same pandemic environment; they tend to believe they are more likely to protect themselves from the disease than those around them. Individuals tend to overestimate both their ability to achieve a certain success in the situation and the favorable circumstances ("hope for good luck"). There is a certain correlation between this assessment and the level of state anxiety (correlation = 0.2328 ($p < 0.01$)), i.e. the higher the anxiety, the higher a person estimates the probability of contracting the disease themselves or of others falling ill. There are two extremes in the Ukrainian society: the part of the population that reasonably estimates their place in the world (if it is a global problem, and I am a part of the world then this is my problem) constitutes 42% of respondents who participated in the study; the part of the population that tends to separate themselves from the society as a whole (state anxiety in this group is lower) – this is a problem of the world but not mine (and am I a part of the world?) – constitutes 41%.

Conclusions: State anxiety is almost independent of characteristics, such as age, gender, or place of residence, but this anxiety differs among people with different views of themselves and their place in society, which necessitates some in-depth research of other personal factors in parallel with state anxiety that could further clarify the situation.

Keywords: COVID-19, Anxiety, Optimism bias, Ukraine

Streszczenie

Wstęp: Sytuacja z COVID-19 jest nieoczekiwana i nieprzewidywalna, a jej skutki tragiczne. Liczba chorych i zmarłych wzrosła na całym świecie, w tym na Ukrainie, i można przypuszczać, że będzie to miało pewien wpływ na stan psychiczny ludzi, w tym na poziom ich lęku.

Materiał i metody: Badanie przeprowadzono w formie wywiadu telefonicznego. Rekrutację respondentów przeprowadzono w okresie od 17.04 do 22.05.2020 r. w sposób losowy. Próba składa się z 412 osób z całej Ukrainy. Badano lęk jako stan, który ma charakter dynamiczny i odzwierciedla poziom lęku w Skali Lęku Stanu z Inwentarza Stanu i Cechy Lęku (STAI) w określonym czasie.

Dyskusja: Różnice zaobserwowano w odpowiedziach respondentów płci męskiej i żeńskiej, przy czym wskaźnik ten był wyższy wśród kobiet. Ludzie mają zazwyczaj odmienne subiektywne podejście do prawdopodobieństwa znalezienia się w tej samej sytuacji, które z przyczyn obiektywnych jest stosunkowo równe dla wszystkich, którzy znajdują się w tym samym środowisku pandemicznym; zazwyczaj wierzą, że mają większe szanse na uchronienie się przed chorobą niż osoby w ich otoczeniu. Osoby mają tendencję do przeceniania zarówno swojej zdolności do osiągnięcia określonego sukcesu w danej sytuacji, jak i sprzyjających okoliczności („nadzieja na szczęście").

Wnioski: Lęk-stan jest prawie niezależny od cech społecznych i wiekowych, takich jak wiek, płeć czy miejsce zamieszkania,

jednak lęk ten jest różny u osób o odmiennych poglądach na siebie i swoje miejsce w społeczeństwie, co wymaga pogłębionych badań innych czynników osobistych równolegle z niepokojem-stanem, który mógłby dodatkowo wyjaśnić sytuację.

Słowa kluczowe: COVID-19, Lęk, Stronniczość optymizmu, Ukraina

1. Introduction

COVID-19 is one of the most serious challenges for humanity [1,2]. Coronavirus is an infectious disease caused by the SARS-CoV-2 virus [3]. The first case of the disease was detected in the Chinese city of Wuhan in December 2019 [4]. Subsequently, a pandemic was declared and quarantine and mandatory lockdown were introduced as necessary measures to control the disease [5,6]. As of February 11, 2024, almost 747 million cases have already been officially registered, of which more than 7 million were lethal. The largest number of reported cases is in the United States, China, and India [3]. Already in May 22, 2020, as many as 20,148 cases were detected in Ukraine (5,211,156 worldwide), of which 588 were fatal. Most patients were registered in the Chernivtsi region, Kyiv, and Kyiv region [7]. As of February 11, 2024, more than 5.5 million cases and 109.9 thousand deaths caused by the coronavirus have been detected.

The situation was unexpected and developed very quickly. At the same time, the situation was extensively covered by the media with predictions of potential consequences [8,9]. The number of sick and dead was increasing, including in Ukraine [7]. With the presence of such a strong trigger, it is reasonable to assume that it will in some way affect the mental state of people, including their levels of anxiety. Anxiety is a feeling of tension, concern, and physical changes such as high blood pressure, sweating, tremor, dizziness, or rapid heartbeat [10].

During the pandemic, mental health problems, including those related to adaptation and phobia, have increased in all populations [11,12]. People who have survived COVID-19 show a high prevalence of acute psychiatric complications, with 55% having pathological manifestations. Survivors are expected to have higher than average rates of post-traumatic stress disorder, severe depression and anxiety [13,14], and all severe non-communicable conditions associated with years of life lived with disability [15]. Therefore, this study aims to measure the level of state anxiety and compare its level in different populations in Ukraine.

1.1. Research hypothesis

In the design phase of our research, we speculated:

- There is a correlation between the level of anxiety (STAI-S) and the self-estimated likelihood of contracting COVID-19.
- Individuals with higher educational attainment tend to experience greater anxiety (STAI-S) levels.
- The source of information about the pandemic influences the level of anxiety (STAI-S), indicating that anxiety levels may vary based on the information channel used.

2. Methods

2.1. Design and sampling

Respondents were recruited randomly using telephone numbers through a panel of an independent research company. The survey was conducted by telephonic interview (CATI). An individual respondent was included in the sample only once during stages 1 to 4 of the study, and the fifth stage was a retest. The fieldwork part of the study took place in the period from 17 April to 22 May 2020.

2.2. Procedures and instruments

This study examined situational anxiety, which is dynamic and reflects the level of anxiety at a particular time depending on the situation. Therefore, the optimal method for measuring it is the State Anxiety Scale from the State-Trait Anxiety Inventory (STAI). If the State Anxiety (hereinafter - "anxiety" or STAI-S) does not exceed 30, that means that the person interviewed does not feel particularly anxious, i.e. they currently have a low (normal) level of anxiety. If the indicator is in the range of a low level of anxiety from 31 to 45, it reflects moderate anxiety. At 46 and more the level of anxiety is high. Very high anxiety (> 46) directly correlates with the presence of neurotic conflict, emotional and neurotic breakdowns, and with psychosomatic diseases. Low anxiety (<30), on the contrary, characterizes the state as depressed and with low levels of motivation. However, sometimes very low anxiety in test scores results from a person's active displacement of high anxiety to show themselves in a "better light."

A number of questions aimed at self-assessment of some actions or judgments were added: Q1 "Rate on a 5-point scale how you assess the possibility of contracting Coronavirus", Q2 "Rate on a 5-point scale how you assess the possibility of your friends and colleagues contracting Coronavirus", Q3 "Do you consider Coronavirus a problem for you?", Q4 "Is Coronavirus a problem for the whole world?", Q6 "Coronavirus has spread all over the world

and is being fought by the most developed countries. Do you think that you personally can influence this situation in any way?", Q7 "Have you violated quarantine rules at least once?", Q8 "Where do you get information about the Quarantine rules/requirements?",Q9 "Do you consider the current quarantine conditions justified and necessary?".

2.2.1. Adaptation of the State Anxiety Scale methodology from The State-Trait Anxiety Inventory (STAI)

Cronbach's alpha was used to test the validity of the test. In the first stage of the study, it was equal to 0.79 and 0.87 for direct and reverse questions. After that, some questions were improved and a Russian-language questionnaire was used separately. After the changes in the following stages, Cronbach's alpha in the Ukrainian-language questionnaire was 0.88 and 0.87, compared to the Russian-language - 0.87 and 0.90.

To verify the validity of the Ukrainian-language test further, a survey of 48 respondents was conducted, the correlation by Pearson was 0.7559.

The t-test did not confirm the differences between the results obtained using the Ukrainian and Russian versions of the STAI questionnaire. The validity of the Russian-language questionnaire was proved by Yu. L. Khanin.

2.3. Statistical analysis

The collected data were analyzed using the software STATISTICA employing 1) descriptive statistics: frequency distribution, mean and standard deviation and 2) inferential statistics: independent t-test and one-way Analysis of Variance, Mann-Whitney U Test, Kruskal-Wallis test.

3. Results

Having analyzed the data on the level of anxiety in terms of demographic factors, we have concluded that women feel higher levels of anxiety than men. The share of "High" and "Moderate" anxiety levels in women is significantly higher than in men (Table 2). Women are 133% more likely to experience high levels of anxiety compared to men. Respondents' subjective assessment of the likelihood that their friends and colleagues might contract Coronavirus is presented in Table 3. According to Multiple Comparisons, the difference is between the average levels of anxiety of those who chose scores 1 and 3, 1 and 4.

Spearman's correlation between anxiety and self-assessment of the probability of getting sick oneself is 0.2328 ($p<0.01$). Spearman's correlation between anxiety and self-assessment of the likelihood of other people becoming ill is 0.2573 ($p<0.01$). Spearman's correlation between self-assessment of the probability of getting sick and estimating the probability of other people getting sick is 0.7670 ($p<0.01$).

The self-assessment of the probability of getting sick is on average 2.22, and the assessment of other people's (friends', relatives', acquaintances', colleagues') probability of getting sick is 2.6, which is 17% higher. The difference, according to Wilcoxon Matched Pairs Test (Table 1), is statistically significant ($p < 0.001$), so, indeed, people tend to believe that they are more likely to stay healthy than the others, thus underestimating the situation and overestimating their prospects and underestimating the prospects of other people.

Table 1. Average subjective estimates of the probability that one might fall ill oneself or their friends and family members might fall ill

Variable	**Mean** ($p<0.001$)	**95% CI**
Q1 Rate on a 5-point scale how you assess the possibility of contracting Coronavirus	2.22	2.11\2.32
Q2 Rate on a 5-point scale how you assess the possibility of your friends and colleagues contracting Coronavirus	2.60	2.49\2.71

Having analyzed the distribution of grades Q1 and Q2 (Table 2), we should note that the shift in self-assessment occurs on the line between grades 2 and 3. Respondents tended to self-assess their probability of falling ill with a score of "1" (lowest), and when assessing other people's likelihood of falling ill, the score tended to reach "3".

On average, people use 1 or 2 channels to obtain information about quarantine measures. Question Q8 "Where do you get information about Quarantine rules/requirements?" was asked to test the hypothesis that state anxiety may change depending on the channel of information. However, the results of the study did not allow for confirmation of this hypothesis (Table 4). It could be stated that there is a connection between the probability of getting sick / the likelihood of one's friends/acquaintances getting sick and the number of channels from which people draw information. This connection is direct but not close – 0.102621 and 0.163285 respectively ($p <0.05$).

When it comes to 55.1% of respondents, they do not perceive the pandemic (Table 4) as their problem, the average anxiety of this group is within normal limits, but much lower (Δ14%) than those who still see COVID-19 as a problem for themselves $p <0.001$).

Although most respondents do not consider COVID-19 a problem for themselves, 83.25% perceive it as a worldwide problem. Here we can assume that people are biased in their thinking and are too optimistic in their

Table 2. Level and severity of participant's anxiety

Variable	Item	n	n%	High	Moderate	Low	Mean	95% Cl
Sex*	Women	295	71.60%	31.86%	49.15%	18.98%	40.83	39.31\42.34
	Men	117	28.40%	13.68%	59.83%	26.50%	36.00	34.09\37.90
Age	25-43	221	53.64%	28.05%	54.30%	17.65%	40.14	38.51\41.78
	44-60	66	16.02%	27.27%	46.97%	25.76%	39.53	36.03\43.03
	over 60	14	3.40%	28.57%	64.29%	7.14%	41.57	34.35\48.79
	under 25	111	26.94%	23.42%	49.55%	27.03%	37.77	35.43\40.12
Education	Higher Education	318	77.18%	27.67%	50.94%	21.38%	39.81	38.38\41.23
	Academic degree	1	0.24%	0.00%	100.00%	0.00%	-	-
	Vocational	77	18.69%	23.38%	53.25%	23.38%	38.23	35.32\41.14
	Secondary School	16	3.88%	25.00%	68.75%	6.25%	38.81	34.58\43.04
Region of Ukraine	The West of Ukraine	107	25.97%	28.97%	53.27%	17.76%	39.96	37.67\42.26
	The South of Ukraine	118	28.64%	23.73%	50.85%	25.42%	38.50	36.13\40.87
	The North of Ukraine	79	19.17%	25.32%	56.96%	17.72%	40.08	37.16\42.99
	The East of Ukraine	41	9.95%	36.59%	43.90%	19.51%	41.41	36.98\45.85
	The Central Region of Ukraine	67	16.26%	23.88%	52.24%	23.88%	38.40	35.41\41.39
The size of the settlement	City (from 100 to 500 thousand inhabitants)	109	26.46%	23.85%	62.39%	13.76%	39.42	37.18\41.66
	Large city (over 500 thousand inhabitants)	90	21.84%	23.33%	44.44%	32.22%	38.18	35.27\41.08
	Town (up to 20 thousand inhabitants)	72	17.48%	27.78%	59.72%	12.50%	40.19	37.46\42.93
	Village	58	14.08%	32.76%	34.48%	32.76%	38.66	35.09\42.22
	Large town city (from 20 to 99 thousand inhabitants)	83	20.15%	28.92%	53.01%	18.07%	40.81	37.97\43.64
n		**412**	**100.00%**	**26.70%**	**52.18%**	**21.12%**	**39.46**	**38.23\40.69**

**p<0.001*

assessments of their own involvement in this problem. Meanwhile, average anxiety is also within normal limits, but individuals who do not consider COVID-19 even as a global problem have a much lower level of anxiety.

Most respondents consider COVID-19 a global problem and (Table 5) their opinion on their participation in this problem was almost evenly distributed. When it comes to 40.05% of respondents, they consider COVID-19 a problem for the world, but not for themselves; 43.2% consider it a problem for the world and themselves, the average anxiety levels in these two groups are 38.01 vs. 42.46, with a statistically significant difference at p <0.01.

Table 3. Level and severity of participants' anxiety

Variable	Points	High	Moderate	Low	p-Value	Mean	95% CI	n
Q1 Rate on a 5-point scale how you assess the possibility of contracting Coronavirus	1	16.44%	52.74%	30.82%	p<0.001	35.50	33.55\37.45	146
	2	27.66%	56.38%	15.96%		40.21	37.77\42.66	94
	3	33.61%	54.10%	12.30%		42.26	40.13\44.40	122
	4	43.24%	35.14%	21.62%		43.65	38.71\48.58	37
	5	23.08%	46.15%	30.77%		40.15	29.73\50.58	13
Q2 Rate on a 5-point scale how you assess the possibility of your friends and colleagues contracting Coronavirus	1	13.68%	51.58%	34.74%	p<0.001	33.67	34.64\35.71	95
	2	21.25%	57.50%	21.25%		38.25	35.55\40.95	80
	3	32.45%	55.63%	11.92%		42.07	40.08\44.07	151
	4	39.39%	39.39%	21.21%		42.71	39.28\46.14	66
	5	25.00%	50.00%	25.00%		41.25	33.95\48.54	20

Table 4. Distribution of individual responses to coronavirus-related variables

Variable	Mean of anxiety		% of n		Δ
	Yes	No	Yes	No	
Q3 "Do you think Coronavirus is a problem for you?"	42.71	36.81	44.90%	55.10%	5.9*
Q4 "Is Coronavirus a problem for the whole world?"	40.31	35.19	83.25%	16.75%	5.12**
Q6 "Coronavirus has spread all over the world and is being fought by the most developed countries. Do you think that you can influence this situation in any way? "	39.13	39.82	52.91%	47.09%	-0.69
Q7 "Have you violated quarantine rules at least once?"	41.21	38.61	32.52%	67.48%	2.6
Q9 "Do you consider current quarantine conditions justified and necessary?"	39.74	38.59	75.00%	25.00%	1.15

p<0.001/p<0.01*

Table 5. Comparison of anxiety levels with different perceptions of the problem of the pandemic

		Q3 "Do you think Coronavirus is a problem for you?"				Δ
		Mean of anxiety		%		
		No	Yes	No	Yes	
Q4 "Is Coronavirus a problem for the whole world?"	No	33.61	49.14	15.05%	1.70%	-15.53*
	Yes	38.01	42.46	40.05%	43.20%	-4.45**

p<0.001/p<0.01*

Despite some blocks of very small samples, cross-comparative analysis of Q3 and Q4 showed a statistically significant difference between all variants, with p <0.001 (table 5). An increase in anxiety is observed in the following sequence: Q3no / Q4no (closest result to the lower limit of normal), Q3no / Q4yes, Q3 yes / Q4 yes, Q3 yes / Q4no – anxiety levels exceed the normal range. The latter option is quite interesting for future research, as feeling your responsibility for a global viral disease, and accepting it only as your problem, but not the problem of humanity combined with a high level of anxiety resembles a pathology.

4. Discussion

The study shows that there is a statistically significant difference between those who identified themselves as male and those who classified themselves as female. Women have a higher rate of anxiety. Similar results (using other instruments) were obtained by A. Moghanibashi-Mansourieh in Iran, where the level of anxiety in women was significantly higher than in men (95% CI [0,1, 81,36], p <0.001). He also witnessed a higher level of anxiety in the age group from 21 to 40 in comparison to other age groups (p <0.001). The results

show that the young population has a lower level of anxiety but its statistical significance has not been proven [16]. Studies conducted by Hyland have shown depression, which was largely associated with younger age, female gender, loss of income due to the COVID-19 pandemic, the presence of confirmed/suspected COVID-19 infection, the knowledge that a loved one has a confirmed/suspected COVID-19 infection, as well as moderate and high levels of anticipated risk of COVID-19 infection [17]. However, Frank reports a small difference between women and men in the USA [18].

In our study, we did not aim to verify the cognitive bias, however, the analysis of responses in Q1 and Q2, gave us the understanding that respondents tended to assess the likelihood that they or the others will find themselves in the same situation with a subjective difference. Overall results have shown that people who are in the same pandemic environment believe that they are more likely to protect themselves from the disease than others. Such results do illustrate the classic situation of the Attribution Error - optimism bias. The same conclusion was reached by Maaravi, Heller in 2020, who studied anxiety in Great Britain using similar methods (STAI) [19,20,21].

Here we have an assessment of the probable future situation in which the subjects tend to evaluate their dispositional features as better than those of others. It is also possible that individuals simply tend to overestimate not only their ability to achieve a certain success in the situation but also the generally favorable circumstances ("Hope for good luck") due to the lack of complex analysis (or simply the impossibility of its application) and assessment of the situation. Based on the results of the study, we could state that there is a certain correlation between this assessment and the level of state anxiety (correlation = 0.2328 ($p < 0.01$)) – the higher the anxiety, the higher one estimates the probability of getting sick oneself and of others contracting the disease. In this case, Q1 and Q2 digress from each other (we can say that Q2 is a more elastic indicator) in the presence of the factor of influence of information received from people around, perhaps this is the result of communication with people who were ill and had severe disease.

While comparing the factors "my problem" (Q3) and "global problem" (Q4), an interesting pattern was found. There is a small group of people who consider the pandemic a problem for themselves but not a problem for the world. This group of people has the highest average anxiety compared to other configurations. This situation needs to be tested on larger samples, as their share is less than 2%. It is difficult to offer any interpretations based on such data, except to admit that this resembles altruism or a specific worldview.

The sample of respondents who do not consider COVID-19 a global problem and a problem for themselves is quite significant, at approximately 15%. People with the lowest (marginal) reactive anxiety may underestimate global tragedies. Not even in hypothetically possible future situations, but in situations of imminent threat whose patterns can be observed.

The hypotheses used while setting research objectives included the opinion that the state anxiety of people with higher education should be slightly higher due to greater awareness and an open mind, and therefore a rational approach to behavior directed at survival. Nevertheless, there is no statistically significant difference in anxiety between people with different levels of education.

Limitation

The study we executed has several constraints.

Firstly, the CATI technique was utilized for the survey through an external provider, with the result quality outlined by the agreed contract.

Secondly, the instruments used, including the STAI-S, were translated and presented in scholarly and educational texts accessible in Ukraine, yet they lacked proper validation. To bolster the trustworthiness of the results, we calculated Cronbach's alpha. Subsequent studies could focus on creating or adapting culturally sensitive tools for war-affected and post-conflict populations.

Thirdly, questions Q1 and Q9 were employed by the authors for the first time. Thus, they had not undergone prior testing or validation as an independent scale. In this investigation, they served to explore views or sentiments about the varied life aspects potentially impacted by the pandemic. This also involved verifying the authors' proposed hypotheses. Given that the distributions of Q1 and Q9 were non-normal, non-parametric analysis methods were utilized.

Conclusions

State anxiety is almost independent of characteristics, such as age, gender, or place of residence. However, we can definitively assert differences in the self-assessment of the threat posed by the pandemic to oneself or to others - cognitive bias. There is a correlation between anxiety and subjective assessment of the situation during the pandemic. And we see that not all people perceive the pandemic as a problem for themselves, nevertheless, research shows that this is only a variant of the norm, possibly under the influence of psychological defense mechanisms. The share of such people is approximately equal to the share of people who assess COVID as a problem both for themselves and for the world. Their anxiety is within normal limits.

Conflict of interest

The authors have declared no conflict of interest.

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