Assessment of Mental Health Status During the COVID-19 Pandemic in Healthcare Workers in Surgical Specialties from Mureș County Clinical Hospital, Romania

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Abstract

Introduction and Objectives. Recent studies rise a concern towards high psychosocial impact of the COVID-19 outbreak among frontline healthcare workers. The purpose of this study is to evaluate the current state of mental health amidst employees of The Mureș County Clinical Hospital, assigned to treating COVID-19 patients.

Materials and Methods. The psychological distress caused by the pandemic and its impact were assessed considering the fear of COVID-19 and the emotional instability – reaction to stress, using well-validated 21-item self-report questionnaire. The sample consisted of 139 healthcare workers of The Clinic of Urology and The Clinic of General Surgery, surveyed in May 2020.

Results. Three months after the set of the COVID-19 outbreak, the intensity of fear leveled at 40% on the Fear of COVID-19 scale, with no correlation to gender, level of education, marital status, or place of habitation. Statistically significant correlations of fear were found with stress scores, fear of going to work and fear of autoinoculation in the hospital ($p < 0.001$), but also with good sleep quality, feeling of appreciation, lack of avoidance and enough personal protective equipment ($p < 0.05$).

Conclusions. Fear and emotional distress are high among frontline healthcare workers because of COVID-19. Training and preparation for future epidemics or disasters is strongly recommended.

Keywords: fear of COVID-19; healthcare workers; psychosocial impact; emotional distress; stress reaction; mental health

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Introduction and Objectives

The widespread of the new Corona virus (SARS-Cov-2), identified in China, on the 31st of December 2019, was recognized by the World Health Organization (WHO) as a pandemic, due to its high contagion potential and increasing incidence [1]. During the pandemic it became obvious that the proportion of people whose mental health is affected tends to be greater than the number of people affected by the actual infection, thus the subsequent psychological and psychiatric implications, underestimated and neglected at both the individual and the collective level. This generates important gaps in coping strategies and increases the burden of associated diseases [2].

After an extended review of the literature, we found that stress, anxiety and pressure on medical healthcare professionals are at a peak during these times, all over the world, in British hospitals [3], Italy, and Singapore [4]. By consequence, fear assessment is of high importance, because it permits evaluating whether education and prevention programs are needed, and if they are needed, which groups should be targeted, where, when and how [5]. Healthcare workers and professionals, who constantly work in a high stress environment, have developed naturally adaptive emotional and behavioral responses. However, when facing the extreme, uncertain and unpredictable stress, counselling and psychotherapy based on a stress-adaption model could be a necessary prompt intervention [6], as it was the case of highly developed countries [7].

On the 15th of May, Romania registered 16,247 confirmed cases, with a daily increase of 245. The number of deaths had reached more than 1,000, with 30 daily new cases added into this category. We conducted our study based upon the above mentioned facts, aiming to determine the impact the COVID-19 pandemic has on the mental health of healthcare workers from a Romanian hospital related to the fear of infection and the emotional instability it causes. As it was already highlighted, unveiling these aspects, gives the opportunity of better understanding themselves and their amplitude, opening a new path towards future development of appropriate interventions.

Materials and Methods

This study was a cross-sectional survey undertaken in May 2020, during the COVID-19 pandemic outbreak, in The County Clinical Hospital of Târgu-Mureș. This unit was reorganized completely for treating patients affected by SARS-CoV-2, starting March 2020. We assessed the current mental health status of healthcare workers – medical and non-medical personnel – in two surgical wards of this unit: The Clinic of Urology and The Clinic of General Surgery of the named hospital.

The study was approved by the Local Ethics Committee of Târgu – Mureș, document no: 8042/18.05.2020; participants in the study were informed on the purpose and the general conditions of the study through an Informed Consent document attached to the questionnaire used.

The subject of mental health was addressed from two high interest points of view of: (1) the fear of contracting the new Corona virus and (2) the healthcare workers' abilities to cope with a new stressful situation. We collected data on demographics (age, gender, educational level, marital status, living environment, need of isolation); we used The Fear of COVID-19 Scale [8] (Cronbach's $\alpha = 0.87$) and Tellegen's Multidimensional Personality Questionnaire – Emotional Instability – Stress Reaction (Tellegen's MPQ-SR) [9] – Cronbach's $\alpha = 0.59$.

We summarized the descriptive statistics for the variables included in this study. Furthermore, we applied normality, non-parametric tests and multiple regression analysis, all this being suitable for our objectives. The information collected through the questionnaire was organized in a database with Microsoft Office Excel and statistically analyzed using IBM SPSS Statistics 26.0.

Results

A total of 139 participants (100%) completed the survey questionnaire, with an average age of 44 years old ($M = 44.10$, $SD = 10.8$, ranging from 20 to 64 years old), 90 (64.7%) female respondents, the majority (79.9 %) held a bachelor's degree or above (Table 1). The medical staff over non-medical personnel ratio was 1.1:1 and only eight respondents had moved out of their usual habitation location for security reasons. None of these populations, divided by the different demographic criteria met the characteristics of a normal distribution of frequencies (Kolm-

Table 1. Demographic characteristics of participants and fear of COVID-19 by demographic variables.

		N	Mean	SD	Skewness
Gender	Female	90	16.32	7.053	0.847
	Male	49	14.24	6.112	0.807
Age	20 – 35 years	37	13.19	4.654	0.966
	36 – 50 years	57	15.54	6.652	0.714
	>50 years	43	17.70	7.963	0.557
Working Experience in Medical Field	Less than 1 year	8	12.00	3.625	1.679
	1 - 5 years	41	14.73	6.450	0.821
	5 - 10 years	13	13.31	5.006	1.504
	10 - 20 years	38	17.45	7.453	0.333
	More than 20 years	32	17.38	7.210	0.906
Education Level	Middle school and below	27	18.48	8.903	0.232
	Bachelor's degree	60	14.90	6.456	1.116
	Master's degree and above	51	14.78	5.533	0.727
Occupation	Non-Medical Personnel	67	15.82	7.949	0.785
	Nursing Staff	46	16.02	6.061	0.788
	Medical Staffl	26	14.23	4.357	0.478
Residence	Apartment	62	15.15	6.724	0.928
	House	62	16.45	7.247	0.750
	Hotel	8	14.88	4.357	0.182
Family status	Single	15	14.07	7.206	1.631
	With Family	120	15.77	6.621	0.829

ogorov-Smirnov test: $p < 0.0001$).

Analyzing the Fear of COVID-19 scale scores (M = 15.6; SD = 6.8; *range*: 7-35; CV = 43.54%; *skewness* = 0.8642; *kurtosis* = 0.0455), we found a highly heterogenous sample with a tendency towards lower levels of fear (Table 2). Moreover, the distribution of frequencies did not pass any of the normality test used ($p < 0.0001$). Comparing fear scores among different samples of the population divided by independent demographic categorical variables, we found statistically significant difference between two age groups, 20-35 and above 50 years old (U = -22.18, p = 0.04) and highly statistically significant correlation between fear of COVID-19 and age (Tb = 0.17, p = 0.01) and level of experience in the medical field (Tb = 0.16, p = 0.02).

Table 2. Fear of COVID-19 Scale, questions and frequency distribution of scores.

		1	2	3	4	5	Total
1.	I am most afraid of coronavirus-19.	36	49	11	30	13	139
2.	It makes me uncomfortable to think about coronavirus-19.	27	36	12	47	17	139
3.	My hands become sweaty when I think about coronavirus-19.	94	26	5	11	3	139
4.	I am afraid of losing my life because of coronavirus-19.	60	34	5	26	14	139
5.	When watching news and stories about coronavirus-19 on social media, I become nervous or anxious.	44	36	16	30	13	139
6.	I cannot sleep because I am worrying about getting infected by coronavirus-19.	75	35	11	12	6	139
7.	My heart races or palpitates when I think about getting coronavirus-19.	75	32	7	15	10	139

Frequency distributions for the 16 Likert independent questions (Table 3) revealed the following: 59% (82) of the respondents felt like the hospital provided with adequate levels of PPE – scoring 4 or 5 – vs. 30% (41) who disagreed – scoring 1 or 2. However, being asked whether they considered there were enough resources to cover the increased need of supplies, only 37% (51) manifested their confidence. Moreover, 44% (61) of the respondents expressed concern regarding the higher risk of getting infected from working in the hospital vs. 47% (65) who did not, while 52% (73), considered themselves as threatens for their families or friends because of their work place; 10% (14) of them took extreme measures like moving out of their normal living habitat and checking into hotels, while 8% (11) of the respondents were obligated to isolate themselves after suspicion of viral infection had been raised. However, only 17% (24) of the healthcare workers questioned expressed actual increased levels of fear of going to work, but more individuals (37%, 51) felt actual fear of returning home to their families after a day of work. Avoidance was experienced by 13% (18) and 39% (41) of the individuals, by their families or their community, respectively. Perceived level of personal psychological distress was low in 58% (81) of the respondents, while 54% expressed concerning on this matter regarding their coworkers. Enough rest time outside working hours was reported by 73% (102) healthcare providers and 71% (98) of them showed no fear facing new challenges. Although, only 35% (48) of the respondents thought they could provide adequate care for their patients, 92% (128) felt confident about their knowledge on self-protection against COVID-19.

We found highly statistically significant ($p < 0.01$) trends of higher median fear scale scores with higher scores noted for most of these questions. Negative correlations with statistical significance ($p < 0.05$) were found between fear scale scores and items targeting matters of sufficient supplies of PPE offered by the hospital, perceived levels of knowledge concerning prophylactic ways of avoiding viral infection, adequate levels of sleep and perceived levels of appreciation, meaning the higher the score these questions noted, the lower the level of expressed fear. Furthermore, these tests also revealed, in a highly statistically significant way, trend of higher median fear scores with higher levels of stress, aspect that was assessed in a subjective manner – respondents were asked to quantify the perceived level of stress through a Likert question – and confirmed with the MPQ-SR validated scale. We found identical correlation coefficients, as found in Table 3.

Multiple linear regression on the dependent variable fear of COVID-19, identified four variables with highest rates of prediction: fear of going to work (unstand. β: 3.528, $p < 0.001$), fear of contamination at place of work (unstand. β: 1.640, $p < 0.001$), the MPQ-SR score (unstand. β: 0.211, $p < 0.01$) and lack of sufficient supplies (unstand. β: -0.852, $p = 0.02$). The adjusted determination coefficient (adj. R2) evolved with individual adding of these variables from 0.370 (one independent variable: fear of going to work), to 0.486 (all mentioned independent variables added), with the two intermediate values of 0.439 and 0.469, respectively.

Furthermore, on predictive models, computed through multiple linear regression, we tested the following three models: (1) *I fear that my hospital will not be able to handle the patient load during the COVID-19 pandemic* (R = 0.26, $R2$ = 0.07, F = 9.87, $p < 0.01$), (2) the previous, plus *Do you have enough rest time outside work?* (R = 0.33, $R2$ = 0.11, F = 7.89, p = 0.001), and (3)

Table 3. Results of correlation tests on Fear of COVID-19 Scale scores.

	Correlation Coefficient[1]	p value
1. I feel that the hospital offers adequate protection against COVID-19.	-0.130*	0.045
2. I fear I will become infected with SARS-CoV-2 at my workplace.	0.455**	0.000
3. I fear my family and/or my friends will become infected with SARS-CoV-2 because of my workplace.	0.478**	0.000
4. I feel that my mental health is challenged during this COVID-19 pandemic.	0.436**	0.000
5. I feel that the mental health of my coworkers is challenged during this COVID-19 pandemic.	0.245**	0.000
6. I think my patients care will be compromised during the COVID-19 pandemic.	0.212**	0.001
7. I fear that my hospital will not be able to handle the patient load during the COVID-19 pandemic.	0.172**	0.007
8. I fear I will not be able to adjust to changes caused by the COVID-19 pandemic.	0.244**	0.000
9. Are you afraid to go to work?	0.484**	0.000
10. Are you afraid to go home to your family after a day at work?	0.383**	0.000
11. Have you experienced avoidance by your family?	0.162*	0.017
12. Have you experienced avoidance by your community?	0.176**	0.007
13. Do you feel like you know how to protect yourself at work from becoming infected with SARS-CoV-2?	-0.056	0.422
14. Do you have enough rest time outside work?	-0.142*	0.033
15. How would you evaluate the level of appreciation you receive for working in the hospital during the COVID-19 pandemic?	-0.157	0.022
16. How would you evaluate your current stress level considering the COVID-19 pandemic?	0.343**	0.000
MPQ-SR[2] Score	0.340	0.000

[1] Kendall's tau-b correlation coefficient; [2] Tellegen's Multidimensional Personality Questionnaire – Emotional Instability – Stress Reaction.
* Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed);

the previous two, plus *I think my patients care will be compromise during the COVID-19 pandemic* ($R = 0.38$, $R2 = 0.15$, $F = 7.49$, $p < 0.001$). All three variables constitute into significant predictors of the level of fear of COVID-19.

Discussions

To the best of our knowledge, this is the first study of its kind conducted in Romania. It was undertaken in the middle and late stages of the COVID-19 outbreak, in a non-epidemic, but still highly affected area, in a tertiary hospital, on two surgical wards redesigned for treating only suspected or positive COVID-19 patients. Out of these two, the Clinic of Urology was the only of its kind, treating urological patients in the area, just as it was previously described [10]. Noting the timeframe of the study, May 2020 towards what it feels to be the end of the outbreak, we considered that assessing levels of knowledge concerning the Corona virus, its spreading and infecting pattern, would be redundant. We were aware of previously obtained results suggesting that good knowledge is a strong predictor of optimistic attitudes and appropriate practices towards self-protection and thus, limitation of the disease spreading [11] and we based our choice of not including this evaluation on recent studies performed on vast cohort of healthcare workers [12].

We also found several methodologies used, including different assessment scales, like Depression, Anxiety, and Stress Scales (DASS-21), the Impact of Events Scale–Revised (IES-R) [13], the Social Support Rate Scale (SSRS), the Self-Rating Anxiety Scale (SAS), the Stanford Acute Stress Reaction (SASR), the Pittsburgh Sleep Quality Index (PSQI) [14]. Although it was a new developed scale, but later validated on two other populations, the Italian [15] and the Arabic [16] one, we chose the Fear of COVID-19 Scale because of its targeted objective, similar to ours: fear has been established to increase anxiety and stress levels, particularly during a pandemic, in both healthy individuals and those with pre-existing psychiatric disorders [2]. We consider that, after performing the study, a COVID Stress Scale would be available and appropriate [17].

We included nurses and physicians in the 'medical staff' group and maintenance workers, administrators, clerical staff, technicians, pharmacists, in the 'non-medical personnel' group. Unlike other studies from the literature which found that females [18] were more likely to experience higher degrees of psychological impact, anxiety, depression, and stress, we could not find any statistically significant correlation between levels of fear and gender. Significantly higher medians of the fear scores in the 'medical staff' group sustain data information found by Lu W. et al. [19] Although some studies found the opposite [20], it seems that multiple factors had a bigger impact on this population sample.

Unlike previously found information on correlation to level of experience in the medical field [12], we found

that the more experience an individual possesses, the higher the level of fear he experiences. This could be relevant taking into consideration the difference in mean values of fear scores between the age groups of 20-35 years old and above 50, with increased scores in the latter group. In a logic manner, an individual that possesses more experience would also have to be older and thus, the difference in fear scores.

The negative correlations we found between fear and variables like levels of sleep and perceived appreciation only come as further enhancement of data obtained by Xiao H. et al. [14], where levels of stress were significantly associated with levels of anxiety, which negatively impacted self-efficacy and sleep quality. In relationship to stress, we can state that the fear of COVID-19 causes, indeed, an intense emotional distress, which is, first, perceived by the individual and then measurable by an objective manner and quantified. Described negative public reactions [4] towards healthcare workers were also reported among our cohort, with a low rate of similar attitudes manifested also by close members of personnel's families. This has also led to increased levels of fear in a statistically significant way; thus, we might agree to the authors cited that this could indeed be 'the first new occupational disease to be described in this decade'[4].

As an overall opinion concerning adequate protection available in the hospital, little over half of the respondents feel safe at work and even less feel confident in the hospital's supplies bank. Even towards the end of the pandemic outbreak, they still manifest high levels of fear of autoinoculation and, more important in their opinion, fear of infecting their loved ones, confirming similar literature findings [18].

High levels of fear of going to work, combined with high levels of fear of viral autoinoculation and an objectively noted high level of stress, lead to high scores of overall fears of COVID-19. However, analyzing the entire cohort included, we can observe that high heterogeneity is present. This could be explained by the timeframe of the study, the main investigator noticing an increased verbalization rate of the change in attitude after adjusting to the new conditions of work. At this point in time, after approximately three months since the beginning of the outbreak, most of the healthcare workers questioned feel confident about their abilities to overcome this new challenge. However, reserves are still mentioned on the abilities to provide adequate care their patients need. Further analyzing this last aspect, we can state that, as long as one feels there are enough supplies, levels of fear remain low; as soon as he starts worrying on this matter, he starts feeling threatened, thus the higher level of fear. Lastly and, maybe, most unexpected for the authors, feeling of meeting standards at work seems to have an important role in lowering the levels of fear.

The strength of this study lies on what we consider to be good sample representativeness. Although one may argue that the cohort is small, we believe that it can be generalized to bigger populations based on its demographic characteristics, but with caution when exceeding the barriers of this geographic area, since it potentially is the first study of its kind in Romania. Another limitation may be the lack of standardized methods of assessing attitudes and practices towards COVID-19, which should be developed through focus group discussion and in-depth interview, as it was already underlined by Zhong BL. et al. [11] Also, our study did not take into consideration socioeconomic status which may become useful in determining associations and designing specific interventions. Future research is still needed to include longitudinal observation of the factors and to evaluate progression or even a potential rebound effect of psychological symptoms once the imminent danger of the disease is eliminated [21]. Ensuring an 'active monitoring' attitude is also highly needed, thus providing appropriate assistance to the staff who become mentally unwell [21].

Conclusions

Three months after the beginning of the COVID-19 outbreak, overall intensity of fear of COVID-19 among healthcare workers leveled at 40%, with a tendency towards rather low scores and an increased confidence in abilities to overcome the new challenge. Fear of going to work, fear of autoinoculation at the place of work and stress levels are highly statistically significant positively correlated with fear scores. Enough hospital supplies, good quality rest time outside work and self-satisfaction upon adequate care of patients act like true predictors of the variable and have a high impact on lowering fear levels. However, taking all the above into consideration, 'active monitoring' of staff is still needed, as well as further studies with the aim of finding the possible appropriate interventions.

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