Anxiety in Home-Quarantined Patients with COVID-19

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Abstract: *One of the challenges of the current pandemic in Romania has been the monitoring of COVID-19 positive patients isolated at home by their family doctors. There was no legal framework or experience in remote medical consultations and there were no clear and comprehensive guidelines for therapeutic management at the beginning of this study. As the pandemic evolved, one of the problems identified from practical experience was that anxiety in this category of patients is an underestimated factor. The present study aimed to provide some clarifying data on the level, determinants, effects and methods of addressing anxiety in COVID-19 patients isolated at home. This approach started on a number of N = 107 patients to whom demographic data were collected and an anxiety questionnaire was applied by telephone. In the next stage, in order to obtain valid results in a timely manner, an online questionnaire was completed by 71 family physicians from Galati County, Romania. Descriptive and inferential statistical analysis was performed using Excel and SPSS software. The results showed that the level and importance of anxiety in these patients are underestimated and one of the key factors to avoid negative endings (delayed hospitalization or unjustified hospitalization) is the self-determination of peripheral oxygen saturation.*

Keywords: *COVID, anxiety, pulse oximetry, delayed hospitalization, phone monitoring.*

Introduction

The Covid pandemic is certainly one of the greatest challenges of the contemporary world and one of the most anxious events globally, at least after the end of the Cold War.

The whole world had to adapt to the pandemic, and health systems were in high demand. If at first all patients tested positive for Covid were hospitalized, the capacity of hospitals to absorb the large mass of Covid patients was soon exceeded. Thus, there was a need for Covid-positive patients with asymptomatic or mild symptoms to be isolated at home. The difficult task of remotely monitoring this category of patients fell in Romania to family doctors.

Because non-Covid hospitals have severely restricted their activity as well as polyclinics, and patients' fear of becoming infected with COVID19 has greatly reduced calls to emergency services and other segments of health care, most family physicians have suffered from over burning during that period (Silistraru et al., 2021).

The additional task of ensuring the telephone monitoring of isolated Covid positive patients at home, including weekends and holidays, which involved a large bureaucratic burden if contracted, meant that, in the case of Galati County, less than 20% of family doctors contracted these services. However, most doctors monitored "pro bono" their patients in this situation.

Before the outbreak of the pandemic, remote medical consultation was not regulated in Romania. This made the monitoring process even more difficult. National protocols imposed the following standard of care for COVID-19 patient self-izolated at home with no or moderate symptoms:

● Home isolation for 14 days
● GP daily phone monitorization
● Self-assessment of: a) Shortness of breath/"lack of air" sensation b) Intense cough c) Fever d) Headache) Muscle pain f) Sore throat g) Lack of taste h) Lack of smell i) Diarrhea j) Fatigue

The official guidelines stated that no medication is needed for asymptomatic COVID-19 patients Also, there are no guidelines for treatment of COVID-19 related emotional distress.

Even from the first calls to the monitored patients, many doctors felt that anxiety, depression and fear of Covid consequences (Jaradat & Stupar, 2020; Loue & Lamb, 2020; Sandu, 2020; Silistraru et al., 2021) are a major unaddressed problem in this category of patients (Baroiu et al., 2021). In

order to investigate this assumption, Covid patients monitored by two General Practitioner settings were included in an observational study.

Material and method

Patients were enrolled in study during monitoring phone calls. They were re-assured about the confidentiality of their personal data and their informed consent was given by phone, as the study is non-interventional. Age, gender and preexistent anxiety status were extracted from their digital clinical records. All participants were advised to buy a pulse oximeter.

Table 1. Characteristics of subjects
Source: authors' own conception

	(n=107)
Age on admission (years)	
Mean (SD)	45.11 (15.19)
Minimum-maximum	13-83
Gender	
Male	62 (58%)
Female	45 (42%)
Admission domicile	
Houses with garden	18 (17%)
Block apartments	89 (83%)
Preexistent anxiety	12 (11%)
Had pulse oximeters	43 (40%)

To assess anxiety, we chose the anxiety subset from The Hospital Anxiety and Depression Scale (HADS) because it was developed to be used in hospitalized patients with somatic diseases, so does not include somatic symptoms as fatigue, sleep disorders or loss of appetite and is easy to administrate (Wu et al., 2021). The test consists in only 7 items and the responses are on a Likert scale with 5 items.

Data was recorded in excel and then imported in SPSS v16. Variables were tested for normality using a visual assessment first (scatterplots, histogram. RR plots), then Shapiro Wilkins test for normality of data was used. The null hypothesis was confirmed, then Spearman's test was used to see if there are significant correlations between the analyzed variables.

In the next phase, to further investigate and validate the results, a survey among General Practitioners from Galati, Romania was conducted

using Google Forms, with 71 responders from the total number of 246 doctors.

Results

Mean anxiety score was 11.49. HADS score was interpreted (figure 1) as normal (0 -7), borderline (8-10) and anxiety (11-21).
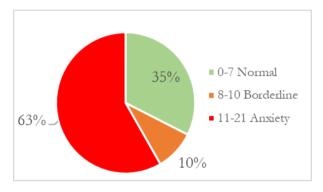

Figure 1 Anxiety classification (percent)
Source: authors' own conception

Our approach to determine anxiety score during phone monitorization had some limitations. We had only to medical settlings in this study and the results were influenced by doctors' views, perception of disease, prescription habits. Anxiety was undertreated, even that 11.2% of the patients were known with preexistent anxiety disorder, only 13.70% of the patients received benzodiazepines 9.34% antidepressants (associated or not with benzodiazepines) and 18.69% received herbal OTCs (with non-documented efficacy).

Table 2. Independent variables significant correlated with Anxiety scores
Source: authors' own conception

	Correlation	Sig2 tailed	p value	Strength
Women	**R=0.340**	0.000	p<0.01	moderate
Rural setting	R=-0.201	0.038	p<0.05	
Garden	R=-0.247	0.010	p<0.05	
Pre-Anxiety	R=0.210	0.030	p<0.05	
No pulse oximeter	**R=0.651**	0.000	p<0.01	medium
Unjustified 112 call	**R=0.279**	0.004	p<0.01	weak
Delayed 112 call	**R=0.251**	0.009	p<0.01	weak
Deaths	R=0.230	0.017	p<0.05	

Pre-covid anxiety base score is not known. Also, we had a small number of terminal events like: unnecessary 112 calls for hospitalization (6), delayed calls to emergency services for hospitalization (6), Fatal events (5).

This part of the study is to be completed with the estimation of the post Covid stress level, but for a faster view of the importance of diagnosing and treating anxiety in home self-isolated COVID-19 patients we analyzed in the second part of the study the perception of family physicians on these issues.

From the analysis of the family physicians answers to the online questionnaire resulted:

● From the beginning of the pandemic to April 2021, the 71 family physicians surveyed monitored 6,113 home isolated patients Mean: 86 patients/doctor (min 0, max 500)

● 80% of them worked «pro bono»

● Anxiety was identified in 53% of the monitored patients (Min 2%, Max 100 %)

● Unanimously the diagnosis of anxiety in this category was considered important (60% considered it very important)

● Most of the doctors surveyed agreed that the level of anxiety was correlated with the unjustified use of ambulance services for hospitalization or vice versa, with the delay or refusal of hospitalization (Figure 2) even when the patient's condition required it.
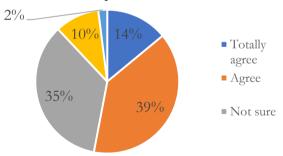

Figure 2. Anxiety level correlation with unjustified or delayed hospitalization

Source: authors' own conception

● The vast majority of family physicians considered that there was a correlation between the intensity of anxiety during the period of home isolation of covid patients and the possibility of permanent anxiety status after overcoming the disease episode. After the end of the isolation period, they noticed symptoms of anxiety, hypochondria, that did not exist before the disease. (Figure 3).

● Anxiety was treated with medication in 22% of all monitored patients (40.% of patients in whom anxiety was identified)

● Most commonly used drug treatment of anxiety in Covid-19 patients were over the counter herbal products (68%), followed by benzodiazepines (20%) and antidepressants associated or not with benzodiazepines (8%)

● Even that current protocol states that no medication is required for asymptomatic Covid patients, in practice, doctors prescribed medication: mainly over the counter herbal products, food supplements as D3, C vitamins, Zn, herbal immunostimulants. 20 % of doctors does not prescribe anything to asymptomatic patients.
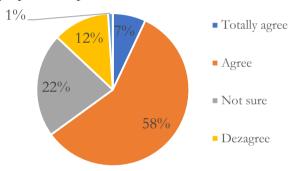
Figure 3. Covid anxiety as a trigger for a permanent after Covid anxious state
Source: authors' own conception

● 47% of the monitored patients had a pulse oximeter available

● More than half of the questioned doctors believed that the level of anxiety was lower in patients who used a pulse oximeter and knew the alert thresholds (Figure 4), almost one third does not have an opinion in that aspect.
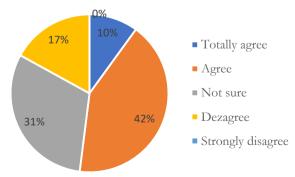
Figure 4. Use of pulse oximeters lower the anxiety level in Covid-19 patients
Source: authors' own conception

Discussions

Anxiety in the Covid positive group of patients isolated at home was particularly high, both in percentage (63%) and in the average anxiety score (11.49). It should be noted that the percentage of anxiety resulting from the application of the HADS test on the 107 asymptomatic or mildly symptomatic Covid patients is comparable to that resulting from the average estimates of family doctors in Galati. Thus, the two results validate each other and show that the questionnaires that test the perception of doctors are sufficiently accurate and a much faster working tool than an observational study on this subgroup of patients.

Anxiety baseline in Romanian general population was in pre-Covid times 4.9% (Florescu et al., 2009), 6.9% (Iovu & Breaz, 2019). The Covid pandemic has increased the percentage of anxiety and depression in the general population, after some studies that analyzed the presentations in psychiatric services, doubling them (Luca et al., 2020). A recent meta-analysis shows that globally the level of pandemic-induced anxiety in general population is 33.33% in China and 47.70% in other countries (Italy, Turkey, and India). This shows that there is an important component of national, socio-cultural specificity in adapting to stressors (Izzat et al., 2021; Necho et al., 2021). Another study that analyzes the level of anxiety in the general population, which also includes data from Romanians, shows a comparatively low level for Romania: 4% severe anxiety, 23% moderate anxiety (Burkova et al., 2021). We did not find other comparative data from Romania on anxiety in Covid patients isolated at home. A study in India shows the level of anxiety as: Mild 11.9%, Moderate 14.8%, Severe 10%, Extremely Severe 4.2%. Adding all this data, it is obvious that the self-isolated Covid patient status is associated with increased anxiety levels compared to the general population.

If in the general population an increased anxiety related to Covid can have beneficial effects such as respecting social distance and all health rules that protect against Covid-19 infection (Harper et al., 2021), in the subgroup of patients isolated at home anxiety has only negative consequences. High levels of anxiety adversely affect resilience in patients with Covid 19 (Uzunova et al., 2021).

The high anxiety score in patients with Covid may also have unrelated causes of Covid: pre-existing high anxiety that is not related to Covid (population studies reveal an upward trend in anxiety before the Covid era), anxiety related to Covid before diagnosis, excessive exposure to the very anxiogenic audiovisual material in the Romanian press.

Although the term Covid-related anxiety is more commonly used, the psychological changes induced by Covid in self-isolated patients are more complex, including fear, depression, stress, anxiety (projected fear without a clear object). Beyond anxiety, there is a justified and concrete fear: fear of aggravation, death, the same fear for loved ones, fear of infecting others, fear of stigmatization (Upadhyay et al., 2020).

Unquantifiable in this study, but of essential importance is the psychological support provided by the doctor: active and empathic listening to the patient's concerns and fears, ensuring education and encouraging treatment, regular updating of the patient on his goals and objectives. "The relationship between physician and patient has a supportive role when it is based on trust and reciprocity, when communication is open, sincere and full of honesty" (Radulescu et al, 2020; Rebegea et al., 2019).

The level of anxiety in the group of 107 self-isolated patients included in our study could be higher than the measured one. The simple fact that they are being monitored daily, that someone is interested in them and trying to help them is a psychotherapeutic approach that lowers anxiety.

From the analysis of the correlations between the level of anxiety and the independent variables investigated in this study (Table 4), the following conclusions can be drawn:

Women have higher anxiety scores than men, this emerged from other studies in Romania also (Iovu & Breaz, 2019). Globally, there are states where there are no statistically significant differences between men and women in terms of anxiety levels (Burkova et al., 2021).

Weak negative correlations were found between anxiety and: rural domicile, living at home with a yard, garden. The correlations found are valid in both situations, even if we find most homes with gardens in rural areas. The data in the literature are contradictory, there are studies in which anxiety is lower (Kowal et al., 2021), the same or higher in rural areas than in urban areas (Nicholson, 2009). As in the case of gender differences, differentiation related to zonal particularities appear. A garden, courtyard offers more space, a relaxing area and an escape from the claustrophobic isolation in flats (Grigoras & Ciubara 2021).

Weak positive correlations were found between anxiety and: preexisting anxiety status, unjustified or delayed emergency calls for hospitalization and deaths. Beyond the value of the anxiety score, the maximum and quantifiable practical importance have the three final points: unjustified call to the emergency services for hospitalization, hospitalization delay and death. A panic attack has respiratory symptoms that can be confused by patient with acute respiratory failure. In this situation, the

patient unjustifiably uses the emergency services, exhausting the limited resources of the health system (Falup-Pecurariu et al., 2017). On the other hand, the fear of hospitalization, maintained by the media, makes patients refuse or postpone hospitalization even if it is recommended by the doctor. This leads to the third unwanted event, death.

The questionnaire completed by family doctors validates the conclusions of the study and adds new elements. The individual variability was particularly high, in the case of question "how many of the monitored patients had a pulse oximeter" for example, the answers given vary between 0 and 100% (see figure 5). However, the average of the answers approximates very well the reality, being in accordance with the results of our study on patients and with the literature data.
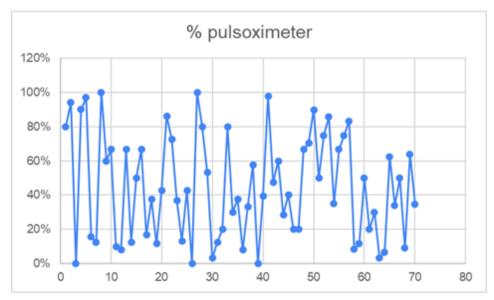

Figure 5. Variability of individual responses
Source: authors' own conception

The current national COVID-19 protocol states that no medication is required for asymptomatic patients and that there are no guidelines for the treatment of COVID-19-related emotional distress. Most doctors choose to strictly follow the rules and not treat anxiety in this category of patients. This choice was motivated on the one hand by the need to comply with the regulations imposed to avoid possible problems of malpractice and on the other hand by the fear that benzodiazepines could aggravate and accelerate a possible respiratory failure. However, we found in our investigation reasons

for treating anxiety. All physicians surveyed considered the diagnosis and treatment of anxiety to be important. It is also known that previous users of benzodiazepines should not discontinue treatment, as the risk of withdrawal-induced delirium, anxiety-induced hyperventilation may impair lung function, tachypnea may be construed as hypoxia, and may lead to unnecessary hospitalization. Anxiety increased the fear of hospitalization, causing delay or refusal of hospitalization (53.5% doctors agreed, the study of patients shows a significant correlation). There is a post-covid risk of persistent anxiety (65.2% of doctors agreed).

All these factors made doctors treat anxiety in 21.54% of all monitored patients and in 40.42% of patients in whom anxiety was identified. The drugs used were: benzodiazepines (19.7%), antidepressants +/- benzodiazepines (8.5%) and herbal OTC (68.4%).

The Covid National Treatment Protocol specifies since November 28, 2020 that patients monitored at home should be sent quickly for evaluation if $SpO2 \leq 94\%$, a threshold known for a long time (O'Driscoll et al., 2017), for patients who did not already have a respiratory impairment. WHO guidelines recommended "use of pulse oximetry monitoring at home as part of a package of care" from January 2021. Covid-19 clinical management: living guideline, 2019). Family physicians who practically monitored COVID-19 patients used self-monitoring of oxygen saturation from the first cases and found that relevant for emergency hospitalization is the rapid decrease of SpO2 from the baseline by 3-4 percent (Greenhalgh et al., 2021).

The survey of family doctors found that 45.6% of monitored Covid patients bought (on the doctor's recommendation) pulse oximeters, 52.2% of doctors believe that the level of anxiety was lower in those who used a pulse oximeter and knew alert thresholds. From the study of patients, the existence of a pulse oximeter correlates negatively with the severity of the anxiety score ($R = 0.651$, $p < 0.01$), the inverse correlation is stronger than with the use of benzodiazepines (this could be a special situation caused by reduced use of benzodiazepines in this lot), also the unjustified or delayed call to 112 for hospitalization is positively correlated with the absence of the pulse oximeter. Monitoring of peripheral oxygen saturation with pulse oximeter also allows safe use of benzodiazepine treatment. Not to forget, oxygen saturation is a key clinical index for evaluating the severity of COVID-19.

The existence of a medical instrument that objectively evaluates respiratory function and clear threshold values set by the doctor of oxygen saturation that require the call of emergency services for hospitalization

helps patients make correct decisions, unaffected by panic attacks, fear of hospitalization. Threshold values compared to oxygen saturation are anchor points in reality that reduce anxieties, fears, negative projections. All these considerations indicate that the pulse oximeter is a key element for the remote management of isolated Covid positive patients at home.

Conclusions

Among the covid positive patients monitored at home, anxiety is positively correlated with: female gender, urban environment, living in flats, pre-existing anxiety disorder, impossibility of self-monitoring of oxygen saturation.

The diagnosis and treatment of anxiety is especially important in COVID-19 patients quarantined at home. The level of anxiety in this category is much higher than in the general population or before the onset of the COVID epidemic19 and affects resilience.

Self-determination of peripheral oxygen saturation is essential in this category of patients for assessing lung damage, reducing anxiety and unjustified or delayed calls to emergency services for hospitalization.

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