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Perception and Attitude of the General Population on the Risk of Infection with SARS-CoV-2

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Abstract

Current state of knowledge on the impact of emotions and perceptions of the population towards the risk of infection with the SARS-CoV-2 should be the basis for disease control measures as well as for community awareness programs. Due to differences in perceptions, concerns, culture, beliefs, different populations may react differently to the same challenges. Ninety adults were interviewed, without symptoms suggestive of SARS-CoV-2 infection, using the Romanian version of the Fear of COVID-19 Scale. The emotional reactions expressed by various psychotic or mental disorders, the main actions are taken to protect against the SARS-CoV-2 infection, as well as the hypothetical illness behavior were investigated. The total score, as well as each item of the Fear of COVID-19 Scale, indicates a low-to-moderate emotional level regarding to the risk of coronavirus infection. The data are supported by the choice to be treated at home in case of illness. There are differences in perception between sexes and between professional categories (employees vs. retirees). Knowledge of social phenomena caused by major epidemiological crises such as SARS-CoV-2 infection should be the basis of education, disease prevention and control programs to avoid the occurrence of psychosocial risks in the population.

Keywords

SARS-COV-2, Fear of COVID-19 Scale, Psychosocial Risk, Comorbidities, Treatment

1. Introduction

Since the report of the first case of human infection with SARS-CoV-2 in December 2019, humanity has entered a new period of alert. On March 11, 2020, World Health Organization (WHO) declared outbreak of a new pandemic named coronavirus disease 2019 (COVID-19) [1]. In order to mitigate the risk of infection, worldwide medical authorities provided the following strategies: social distancing, wearing personal protective equipment, cleaning, disinfecting, avoiding crowded indoor and outdoor spaces and home working. Although the medical authorities clearly explained the measures taken, the impact on the population was extremely heterogeneous and unpredictable [2]. Moreover, frequent in-person and social media protests took place [3].

A feature of COVID-19 disease that clearly differentiates it from other contagious diseases is fear related to transmission rate, morbidity, and mortality. Fear makes people not think and act rationally. Worldwide, governments and medical authorities focused on disease prevention measures and treatments and neglected the psychological component of individuals.

Due to lifestyle changes and free travel of people, in conjunction with an outburst of news related to the pandemic evolution, there has been a higher prevalence of depression [4] and coronaphobia [5], along with a denial of the existence of SARS-CoV-2 or the global impact of COVID19. Some authors have described possible concordances between the scale stages of the Kübler-Ross model (denial, revolt, anger, resignation, depression) [6], with regard to attitudes observed both in the general population and medical staff (including medical students) [7].

In order to assess the public's perception of the impact of measures to limit the spread of SARS-CoV-2 infection, a number of surveys have been designed such as Fear of COVID-19 Scale (FCV-19S) translated and validated in several languages [8]. The Romanian validation of FCV-19S was recently published based on classical test theory (CTT) and item response theory (IRT), namely, graded response model (GRM) [9]. Other studies that used the FCV-19S questionnaire revealed its stability through robust psychometric properties [8] [10].

Ahorsu et al. showed that the high overall score obtained correlates with a high level of fear of COVID-19. However, there is no correlation among gender, age, and fear of COVID-19. The gaps of their study consisted of weak sampling, lack of data on commodities, subjectivity in fear assessment and the population homogeneity [8]. In a study of the Israeli population, Bitan and collaborators showed that some demographic factors were associated with high COVID-19 fear, especially in women, low income individuals, and individuals with chronic illness. Families with COVID-19-related deaths showed similar results [10]. The data obtained might have been influenced by the gender distribution of the sample population (which included a large percentage of women), percentage of individuals without internet access, or elderly individuals.

Due to the lack of heterogeneity of the subjects included in previous studies, it

is necessary to evaluate different populations in order to emphasize whether there are real differences in the perception of COVID-19.

The aim of the current study is to analyze the perceptions of an adult Romanian population selected randomly, regarding the risk of SARS-CoV-2 infection and actions taken to reduce it. Possible links between demographic factors and different perceptions of infection risk were also assessed.

2. Materials and Methods

Informed consent was obtained from all subjects involved in the study.

The FCV-19S questionnaire was translated from English into Romanian and then adapted for the purpose of this study [11]. The translation of the questionnaire was done bi-directionally, from English to Romanian and then from Romanian to English and the two English versions was compared for sense and accuracy. The questionnaire included seven items from the FCV-19S validated in the previous studies and was created in order to investigate the population's perception on SARS-CoV-2 infection. The questions in the Romanian version concern age, sex, socioeconomically status, comorbidities, and measures adopted for protection against the viral infection. A point of interest was also represented by the study on the population's perception of the type of healthcare in the hypothetical illness scenario: hospitalization versus at-home care.

The questionnaire was distributed to those who agreed to participate in the study. The emotional perception of the situation caused by the SARS-CoV-19 infection was assessed by questions with answers from 1 to 5 (strongly disagree to strongly agree). The total score of the answers, which was between 7 and 35, reveals the presence of emotional reaction in the existing situation. A total score was calculated by adding up each item score (ranging from 7 to 35). The highest score indicated the highest coronaphobia.

One hundred questionnaires were administered to a general adult population in the District of Iasi. The surveyed population was randomly selected, consented to participate in the study anonymously, and did not have symptoms suggestive of SARS-CoV-2 infection. Paper questionnaires were distributed in public areas, and electronic surveys were sent via social media. The electronic surveys were sometimes ignored. For this reason, only 90 valid questionnaires were collected. The data were collected between October-November 2020.

The paper questionnaires were distributed with safety protocols in place to prevent the spread of the virus. The subjects' data privacy and security were ensured.

The statistical analysis included the score recorded for each item, and the total score for the seven items of FCV-19S were analyzed for the study group. The results were analyzed comparatively, by taking into consideration differences in concerns, attitudes, and beliefs between employed and retired individuals. The MedCalc version 14.8.1. Software was used for statistics. The descriptive characteristics of the groups' variables were expressed as mean values and standard deviations (SD). T-test assumes equal variances were applied in order to assess signifi-

cant differences between the study groups. Spearman's correlation coefficients among the scores were recorded for each of the seven items of the FCV-19.

3. Results

From of the ninety participants in the study, men (60%) and retirees (53.3%) predominated. The demographic characteristics of the studied population are listed in Table 1. Sixty respondents (66.7%) stated that they have various comorbidities, especially cardiovascular diseases.

A global analysis of the study group found that coronaphobia is moderately appreciated by an average score of 3 on the questions I am most afraid of coronavirus-19 (Q4), 2.6 to It makes me uncomfortable to think about coronavirus-19 (Q5), and 2.9 to I am afraid of losing my life because of coronavirus-19 (Q6), respectively. Lower scores were recorded at physical and mental manifestations such as nervousness or anxiety (Q7), clammy hands (Q8), sleeplessness (Q9), and palpitations (Q10) (2.3, 1.3, 1.3, 1.6 respectively). For all these queries, we found a median of 1, which indicates that most subjects didn't experience emotional manifestations of risk of coronavirus infection (Table 2).

Although the studied population, according to the average score, stated that they were not worried or were a little worried about the risk of infection, all subjects claimed that follow protective measures such as wearing masks (44.7%) and avoiding enclosed spaces (44.7%). Staying at home as the main protective measure against infection was indicated by 6.6% of subjects.

Whereas there were behavioral, social, and perceptual differences between retired and employed individuals, a differentiated analysis was performed on the two groups. The comparative analysis showed, as expected, a significantly lower mean age at employed individuals compared to retired individuals (43 vs 70.25, P = 0.01) (Table 3).

Table 1. Demographic characteristics of the study sample (n = 90).

Factor	n (%)
Mean age	57.5
Below 50 years	30 (33.3%)
51 years and above	60 (66.7%)
Gender	
Male	54 (60%)
Female	36 (40%)
Socioeconomic status	
Employees	24 (26.7%)
Retirees	48 (53.3%)
Other (unemployed, freelance)	18 (20%)
Comorbidities	60 (66.7%)
No COVID-19 symptoms	90 (100%)

Table 2. Descriptive statistics and item-total correlation of the Fear of COVID-19 Scale (n = 90).

Factor	Mean (SD)	Median	Kurtosis	Skewness
Age (years)	57.5 ± 16.6	61	−1	−0.5
I am most afraid of coronavirus-19 (Q4)	3 ± 1.5	3	−1.5	0
It makes me uncomfortable to think about coronavirus-19 (Q5)	2.6 ± 1.6	2	−1.6	−0.4
I am afraid of losing my life because of coronavirus-19 (Q6)	2.9 ± 1.6	3	−1.6	0.12
When watching news and stories about coronavirus-19 on social media, I become nervous or anxious (Q7)	2.3 ± 1.5	1	−1.3	0.5
My hands become clammy when I think about coronavirus-19 (Q8)	1.3 ± 1	1	10.7	3.5
I cannot sleep because I'm worrying about getting coronavirus-19 (Q9)	1.3 ± 1	1	10.7	3.5
My heart races or palpitates when I think about getting coronavirus-19 (Q10)	1.6 ± 1.4	1	2.5	2
Total score.	14.9 ± 7.2	13	1.8	1.4

Table 3. Comparative analysis between employees and retirees.

Factor	Employees (no. 24)	Retirees (no. 48)	P
Age (years)	43 ± 11.93	70.25 ± 6.85	0.001
I am most afraid of coronavirus-19 (Q4)	3 ± 1.25	2.87 ± 1.71	0.108
It makes me uncomfortable to think about coronavirus-19 (Q5)	2.75 ± 1.82	2.87 ± 1.71	0.687
I am afraid of losing my life because of coronavirus-19 (Q6)	2 ± 1.77	3.5 ± 1.43	0.214
When watching news and stories about coronavirus-19 on social media, I become nervous or anxious (Q7)	2 ± 1.77	3.5 ± 1.43	0.214
My hands become clammy when I think about coronavirus-19 (Q8)	2.25 ± 1.33	2.5 ± 1.67	0.227
I cannot sleep because I'm worrying about getting coronavirus-19 (Q9)	1	1.5 ± 1.34	-
My heart races or palpitates when I think about getting coronavirus-19 (Q10)	1	1.5 ± 1.34	-
Total score.	13 ± 5.21	16.87 ± 8.52	0.013
Want to be treated at home if I get sick	6 (25%)	30 (62.5%)	0.006
Comorbidities	6 (25%)	48 (100%)	<0.0001

For the questions related to emotional perception and organic physical reactions to disease, it was observed that there were no statistically significant differences between the two groups, with generally lower scores registered for employed individuals. However, the total score obtained was statistically significantly higher for retired individuals (16.87 ± 8.52 versus 13 ± 5.21, P = 0.013).

Coronaphobia may also be due to the higher frequency of comorbidities

present in retirees compared to active people (100% versus 25%, P < 0.0001). Regarding the behavior in case of illness, it was noted the preference of retirees to have home care, unlike employed individuals (62.5% vs 25%, P = 0.006).

A comparative analysis based on gender revealed a significantly higher total score in women (95% CI 6.55 - 11.44, P < 0.001), which suggested an increase fear of COVID-19. The higher level of fear was based on symptomatic expression of fear component in women (95% CI 1.34 - 3.77, P < 0.001) compared to men. Moreover, with regard to attitudes toward health care in case of COVID-19 illness, women were more undecided than men (33.3% versus 11.1%, P = 0.0208), who were more determined to be hospitalized. Also, more women chose to wear a mask as the main COVID-19 preventive measure (66.7% versus 33.3%, P = 0.0038).

The statistical relationships among study items were tested by Spearman's correlation analysis, and the results are shown in Table 4. Data showed significant relationships between physical reactions about getting coronavirus-19.

The current research is, in our knowledge, the third study conducted in Romania which followed the population's fear of COVID-19 using Fear of COVID-19 Scale. A published study, although not representative for the entire Romanian population, indicated that the people faced this fear regardless of age. Also, the mean level of fear of COVID-19 was quite low because most respondents had higher education. Women expressed a greater fear than men [9]. Another study showed that after an average isolation time of almost 37 days, the perceived levels of loneliness, death obsession, and preoccupation with God significantly increased in the Romanian sample [12]. Also, when loneliness levels are high, age becomes a significant predictor of fear of COVID-19 because the elderly are more afraid than younger people when they feel lonely. Both studies validated the use of Fear of COVID-19 Scale as a measurement tool for assessing fear of COVID-19 among the general population.

4. Discussion

Looking back at how the pandemic evolved and progressed over the last year, it

Table 4. Spearman's correlation coefficients among study items.

Factor	Q10	Q4	Q5	Q6	Q7	Q8	Q9	Total
Q10		0.299*	0.357*	0.293*	0.253*	0.576*	0.576*	0.334*
Q4	0.299*		0.712*	0.383*	0.479*	0.381*	0.381*	0.769*
Q5	0.357*	0.712*		0.421*	0.525*	0.388*	0.388*	0.804*
Q6	0.293*	0.383*	0.421*		0.495*	0.351*	0.351*	0.761*
Q7	0.253*	0.479*	0.525*	0.495*		0.439*	0.439*	0.793*
Q8	0.576*	0.381*	0.388*	0.351*	0.439*		1.000*	0.435*
Q9	0.576*	0.381*	0.388*	0.351*	0.439*	1.000*		0.435*
Total	0.334*	0.769*	0.804*	0.761*	0.793*	0.435*	0.435*	

Significance level: *P < 0.05.

can be said that even the best healthcare systems can be overwhelmed by the large number of infections. Due to deeply social influences in modern society, it seems that the best strategy for managing the number of cases is to control the sources of infection.

Decisions on traffic restrictions, socialization and entertainment were probably based on such reasoning. However, we found, based on the data provided by the administered questionnaires, that the population was rather reserved in perceiving the size of the risk of infection. Although 100% of respondents stated that they have adopted more protective measures (wearing a mask, avoiding enclosed spaces, and staying indoors), 33.3% stated that they have not changed their habits regarding washing or disinfecting their hands. These aspects suggest behavior based on social compliance rather than belief in present risks. Similar data about low levels of compliance regarding hygienic measures were published by Nivette *et al.* [13].

Another interesting aspect revealed by the answers to the questionnaires refers to the attitude followed in case of a hypothetical coronavirus infection. Even if the recommendations from the time of administration of the questionnaires supported hospital admission for all patients found positive for SARS-CoV-2 infection, we found that only 53.3% of the subjects preferred this option.

The option to stay at home in case of illness was preferred by retirees, even though comorbidities were more common in this population category. This reluctance to admission to the hospital in the case of SARS-CoV-2 infection may be explained by the fear of death during hospitalization and its consequences related to the lack of funeral rituals. The data obtained are consistent with the literature that describe the reluctance of elderly patients to multiple hospitalizations [14].

Public awareness and acceptance of preventative measure may increase if health officials communicate that approximately 15% of infected individuals require hospitalization and 5% require critical care [15]. A broader vision, focusing on five key directions—development, economics, evidence-based medicine, human rights and security—requires a superior approach when uncertainty prevails [16].

People without comorbidities had a lower overall emotional score (11 versus 16.9), which suggests that subjects with pre-existing conditions were more concerned about the risk of illness. This situation was expected due to the higher risks for an unfavorable outcome reported for people with cardiovascular disease and diabetes [17].

Another significant aspect is the different emotional perception between the sexes, women being significantly more emotionally affected compared to men (average total score: 20.3 vs 11.3, $P < 0.001$). This aspect is also reinforced by the fact that men did not change their habits to a much greater extent compared to people of the opposite sex (44.4% vs 16.7%, $P < 0.05$). Similar results were reported by Di Renzo *et al.* [18].

However, the preference for home care or hospitalization tends to be uniform for both sexes (55.6% of men prefer to stay at home vs. 50% of women). The more pronounced emotional reaction in women has been observed in other studies being explained by the authors through a greater vulnerability and sensitivity to stress [10].

Knowledge of social concepts and behaviors allows authorities to act in such a way as to achieve high levels of compliance with rules imposed to reduce the risk of transmission and infection, while at the same time reducing public anxiety. Misinformation spread faster than the pandemic itself, leading to the internalization of false concepts, from the harmful effects of wearing masks to fear of hospitalization [19].

In addition, the fear of being stigmatized by images of patients transported under special conditions may be the basis for the preference to stay at home in case of a hypothetic SARS-CoV-2 infection. Even the label "suspicious COVID-19" has a major emotional impact on society [20].

Previous studies performed on Romanian respondents revealed similar results. Enea *et al*. showed that quarantine due to COVID-19 pandemic had a stronger impact on women, single people, and those with death obsession [12]. In another study, Stanculescu highlighted similar expressions of women's emotions [9]. Overall, these studies have results consistent with our data, which shows, an obvious exacerbation of feelings of insecurity, loss of control, and health insecurity. The death obsession as a predictor of fear of COVID-19 is suggested in our study by the apparent refusal of hospitalization encountered mainly in retirees, given the restrictions on the funeral ceremony in case of death in a hospital setting. In addition to previous studies, the current study investigated other components of the population's attitude regarding the risk of infection, such as preventive measures and the preferred type of care in case of illness. The data obtained indicates the discrepancy between certain measures imposed by the authorities and the desires of the population, a discrepancy that can lead to social ruptures and behavioral deviations, as suggested in Enea's study [12].

Although this study provided strong evidence for an assessment of fear of COVID-19 based on the FCV-19S questionnaire, it has several limitations. The study group was not large enough, and the study was conducted in an urban area; for this reason, the results may not apply to the general Romanian population. The proximity of the hospital and urbanization could influence the perception of the population regarding the risk of infection. However, the results obtained are consistent with those published in other studies, both in the Romanian population and in various other populations, which suggests that the possible influences were minor. Another limitation could be generated by the lack of information related to the level of education and the rate of fear, because in other studies these were correlated. However, based on statistical data on the percentage of people with tertiary education in Romania, which is the lowest in the EU (26%), it can be assumed that in the studied group most subjects have a

moderate educational level.

Additional objective measures of fear could be evaluated in large-scale epidemiological studies. Such studies should follow the specific consequences of fear of COVID-19 (anxiety, depression, boredom, loneliness, anxiety, sleep problems and anger) in relation with biomarkers, but they require financial support from authorities or other funding sources.

Health authorities that cooperate and communicate transparently could improve the social acceptance of new regulations and must actively intervene to reduce social stigma [21].

5. Conclusion

Knowledge of social phenomena caused by major epidemiological crises such as SARS-CoV-2 infection should be the basis of education, disease prevention, and control programs to avoid the occurrence of psychosocial crises in the population.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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