

Changing of Health Anxiety in Disadvantaged Population During the Pandemic

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Extended Abstract

We have lived our lives in the spirit of the COVID-19 pandemic in the latest period, which demanded serious sacrifices in Hungary as well. By the spread of the epidemic, more and more and younger people fought with the disease, several people worried about their relatives' and friends' health. The period of the pandemic and the central provisions aiming at stopping the spread of the epidemic affected people in several different ways, but it has no doubt that confinement, restrictions and the lack of interactions had mental effects on everyone. Over the fear from becoming infected, the reorganization of the healthcare system also influenced people's mental status, and increased their anxiety and health anxiety, since the care of pre-existing chronic diseases and the diagnostics and therapy of new acute diseases were performed based on a new unknown protocol. Our research examined the population's health anxiety in a highly disadvantaged region of Hungary along more dimensions in the second and third wave of the pandemic. Our research goal was to get to know the level of health anxiety according to different settlement types, genders, ages and occupations, and to compare its change with the measured data of the option and willingness for vaccination. Our special goal was the assessment of the healthcare workers' mental status and monitoring of its changes. For the on-line survey research, we used standard questionnaires also validated in Hungarian language: the Short Health Anxiety Inventory - Hungarian version (SHAI-H) (Köteles et al, 2011), the 5-item WHO Well-being Index (Susánszky et al, 2006) and the Adult Hope Scale - Hungarian version (AHS-H) (Martos et al, 2014). During data recording, we queried labour market status, relationship status and the size of the residential settlement besides the socio-demographic data (gender, age, education). There was one question about the respondent's evaluation regarding his/her own health status and another about religiousness. There were further questions about COVID-19 infection or its suspicion in terms of the person's own and immediate environment, the severity of the perceived symptoms and the form of the necessary health care. Data recording of this current cross-sectional research was performed in the end of November 2020 and in the beginning of December 2020 at first, and then in March 2021, the questionnaire was filled by 528 persons in the second wave and 515 persons in the third wave. Although the survey, the cohort study performed by on-line sampling is

not representative, due to the size of the sample, data provide an informative picture about the mental status of the population of the North-eastern region of Hungary and its changes during the second and third wave of the pandemic. Results: The average age of the 528 persons involved in the first phase of the research was 39.4 ± 13.1 years, the willingness to respond was similar in the second phase ($N=515$), and there was a small decrease in the average age ($x=34.7 \pm 13.05$ years). At the time of the first data recording, 16.7% of the respondents had undergone the COVID-19 infection, while this number was 24.1% in the second phase. At first, most of the people having been infected (50.4%) had mild symptoms, while 47.8% survived the disease with medium strength symptoms. When we asked about the wider environment, they reported essentially more infections: the infection could have been detected in all the respondents' households. 22.7% of those living in one household had at least one member and 77.3% had more than one infected family members. The severity of the course of the infection was different: 32% judged it very mild, 60.9% said it was medium, 3.1% of them needed hospitalization, and the course of the infection was fatal in the environment of 3.5% of the respondents. In the second phase of the research, most of the people having been infected (45.1%) had mild symptoms, while 52.6% suffered from medium strength symptoms. 37% of those living in one household had at least one member and 63% had more than one infected family members. The severity of the course of the infection was different: 26.5% judged it very mild, 58% said it was medium, 9% of them needed hospitalization, and the course of the infection was fatal in the environment of 4.5% of the respondents. Overall, the pandemic influences the population's mental status and health anxiety in an obviously negative way in the examined region, it shows correlation with subjective health status, and we do not know its long-term effects at this time.

Keywords: pandemic, health anxiety, subjective health status, mental well-being

I. Introduction

The aim of our research is the examination of the population's mental health in a highly disadvantaged region of Hungary in the different waves of the pandemic. We examined stress, mental well-being, hope and health anxiety perceived among the population in the second and third waves of the pandemic by a standard, validated questionnaire along several dimensions. (Rucska & Lakatos, 2021, Lakatos & Rucska, 2021). The goal of this current study is the exploration of the level of health anxiety according to different settlement types, genders, ages and occupations and its changes, compared with the measured data of the option and willingness for vaccination. Our special goal is the assessment of the healthcare workers' mental state and monitoring the changes. Although, our results from the time of the second and third waves of the pandemic are not representative, the examination provides an informative picture about the mental characteristics of people living in North-east Hungary, especially regarding health anxiety.

II. Literature Review

In the last one and the half year, several studies and statements have dealt with the effects of COVID-19 on physical health (Cao & Li, 2020, Lvov et al., 2020) and mental well-being (Brooks et al., 2020, Csikós et al., 2020, Pfefferbaum & North, 2020, Serafini et al., 2020). The study results have continuously proved that the pandemic shows correlation with the worsening of the symptoms of depression, anxiety, health anxiety and perceived stress (Li et al., 2021, Tyrer, 2020, Xiong et al., 2020). The fear from getting ill and the stigma associated with it, social distance, isolation, existential uncertainty, the lack of information or its contradictions are associated with such negative mental symptoms as frustration and boredom, post-traumatic stress reactions, panic symptoms, anger and irritability, low self-esteem, and the feeling of loneliness and helplessness (Brooks et al., 2020). The listed negative internal conditions significantly decrease the level of mental well-being (Serafini et al., 2020).

Health anxiety is one of the most common anxiety types. In fact, anxiety related to health is the most natural reaction, everyone experiences it at least once in a lifetime. It is natural to worry about our health, and if we perceive endangering factors, we may become anxious because of the imagined negative outcome. On an optimal level, health anxiety can be considered as an adaptive process, since it helps self-care, makes people motivated to do health-protecting steps (i.e., using screening examinations), or stop or avoid health-damaging behaviour (i.e., smoking, alcohol consumption). Health anxiety can become problematic if its level affects several areas of the individual's life, it influences negatively or seriously inhibits the person in his/her everyday activities. Based on these, health anxiety should be viewed as a continuum, from the anxiety-free state to the extreme, hypochondriac anxiety. (Kosic et al., 2020, Salkovskis, 1996)

The cognitive model of health anxiety (Salkovskis, 1996) makes difference between the factors playing role in the perception of danger and the processes playing role in the persistence of anxiety. The method of thinking, misinterpretation of the signs, previous experiences and individual, dysfunctional attitudes related to the disease (i.e., every unknown physical phenomenon means an illness), and critical causing events (a friend's death or stress) belong to the first group. Factors playing role in the maintenance of anxiety occur in the fields of thinking, emotions and behaviour. Selective attention directed to the body's functions (constant self-examination), negative mental distortions, worrying about the symptoms lead to nervousness, restlessness, distress and anxiety. These generate such stress reactions that result in newer physical symptoms, then the person can misinterpret this again and the vicious circle of health anxiety starts again. All these lead to the vision of a catastrophe, increasing anxiety and behavioural changes (avoiding the thought health-damaging factors etc.). However, behavioural change can decrease anxiety on a short-term, it strengthens false beliefs related to the disease on a longer term, so finally, it serves their persistence. (Abramowitz et al., 2007, Wheaton et al., 2010)

Examining health anxiety on the whole population, the results suggest that its strength can be found in the continuum mentioned above: from the worry related to trivial health to the clinical level, including hypochondriasis and pathological health anxiety. On the order of the examinations, no differences could be detected in the different groups of age, gender or socio-economic status. (Kosic et al., 2020) At the same time, it is remarkable that clinical level health anxiety can often become chronic (Olde Hartman et al., 2009), it increases the person's distress level, inhibiting performing routine activities, and it decreases subjective health state. (Hedman-Lagerlöf et al., 2017) All of this is already clearly accompanied by a deterioration of the quality of life and psychological well-being. (Köteles et al., 2011; Perge & Veresné, 2021)

The COVID-19 pandemic lasting for nearly one and a half year has caused the general increase of the level of health anxiety. Studies in this topic warn for the characteristics of health anxiety related to COVID-19 and its negative consequences expected in the near future. (Asmundson & Taylor, 2020, Saurer et al., 2020, Tyrer, 2020) Since both too high and too low health anxiety may affect harmfully the individuals' and communities' adaptive reaction for the pandemic in this situation, it has become important to explore and, by the changes of the pandemic situation, to monitor its level and understand the influencing factors. (Asmundson & Taylor, 2020)

The examination of health care workers' mental health has been the subject of several statements since the spread of the pandemic. (Papp et al., 2020, Shanafelt et al., 2020) During the exploration of the level of health anxiety, research has found a higher anxiety level among health care workers compared to the average population. (Mokhtari et al., 2020, Mohd et al., 2021)

III. Methods

1. Participants

The first data recording of this current cross-sectional on-line research was performed in the end of November and in the beginning of December in 2020, the second was performed in March 2021. Only people over the age of 18 could be included in the on-line survey research. Educational level, relationship status or the settlement type were not criteria in the research. Before filling the questionnaire, the participants received written information about the aim of the research.

The questionnaire was filled by 528 persons at the time of the first data recording. The second data recording was performed at the time of the Hungarian occurrence of the third wave of the pandemic in March 2021, and 515 persons filled the questionnaire in this period.

2. Measures

During data recording, we queried labour market status, relationship status and the size of the residential settlement besides the socio-demographic data (gender, age,

education). There was one question about the respondent's evaluation regarding his/her own health status and another about religiousness. There were further questions about COVID-19 infection or its suspicion in terms of the person's own and immediate environment, the severity of the perceived symptoms and the form of the necessary health care. As we were curious about how the nature of the pandemic (faster spread and more serious course of the disease than the previous one) and the availability of the vaccine or its absence influence mental phenomena, we complemented our questionnaire by two questions about being vaccinated and the willingness for vaccination, and additionally, two questions about the demand for mental support.

We used the Short Health Anxiety Inventory (SHAI) for the examination of health anxiety for both data recording, while the Religious Self-categorisation Scale (Tomka, 1998) was used for measuring religiousness.

The SHAI (Salkovskis et al., 2002) is an 18-item scale which measures health anxiety independently from physical health state. The items ask about worries related to health status, attention directed to physical happenings and the consequences of a potential illness. (Köteles et al., 2011) The health anxiety questionnaire is a reliable measuring tool (Crombach's $\alpha=0.83$). The scale variables contain disease belief, tendency for a disease, fear, nervousness about a disease, physical consciousness, fears related to death and attitudes related to the others' and the own health. The questionnaire has two sub-scales: one is the perceived possibility of getting, becoming ill, the other is the perceived consequence of the disease (Perczel-Forintos, 2018).

One question measured the respondent's own religious practice: "Do you practice any religions, and if yes, how?" Answer could be given on a 6-level scale: "I am not religious", "I do not practice my religion", "I practice my religion on my own way", "Rarely, but I practice my religion in my church", "I regularly practice my religion in my church", "I do not want to answer". (Tomka, 1998)

We used IBM SPSS Statistics 20.0 program for data processing and analysis, and over descriptive statistical methods, we used correlation analysis, T-probe and chi-squared test.

3. Results

Demographics

The mean age of the 528 persons participating *in the first phase of the research* (in the second wave of the pandemic) was 39.4 ± 13.1 years. 44.7% of the respondents live in cities, 28.8% in towns and 26.1% live in villages. Most of them has higher education level (59.3%), 28.2% has high school final graduation, 7.3% has technical qualification, 20.7% are workmen and 2.5% has basic education. Most of the respondents has a regular job (62.1%), the rate of students (15.3%) and women raising infants (11.5%) is high. Pensioners (7.5%) and unemployed people (2.5%) also took part in the research. 45% of the unemployed people have lost their jobs

more than a year ago, 27.3% in the last year and 27.3% has become unemployed in the last 3 months. The majority has intellectual jobs (31.9%), 23.5% has other kind of intellectual job, and 23.7% works in health care. Most of them work in a subordinate position (69%), but 12.3% is self-employed, 10.9% is a middle manager, 3.9% is the rate of group leaders and 3.9% works as a senior manager.

16.7% of the asked people have undergone the COVID-19 infection, 37.9% of them are unsure about undergoing it. Most of the people having been infected (50.4%) had mild symptoms, while 47.8% suffered from medium strength symptoms. When we asked about the wider environment, they reported essentially more infections: the infection could have been detected in all the respondents' households. 22.7% of those living in one household had at least one member and 77.3% had more than one infected family members. The severity of the course of the infection was different: 32% judged it very mild, 60.9% said it was medium, 3.1% of them needed hospitalization, and the course of the infection was fatal in the environment of 3.5% of the respondents. When examining a much wider environment, we met greater dispersion: 17.5% said that there were not infected people among his/her wider family or friends, one infected person could be detected in case of 22.4%, and more relatives or friends were COVID-19 infected in the case of 60.1% of the respondents. In this group, mild symptoms were reported only in 21.3%, medium strength symptoms could be detected in 53.5%, 9.8% received hospital treatment, 2.1% received intensive care and 13.1% of the cases were fatal.

At the second data recording (in the third wave), the number of the respondents was 515, their mean age was 34.7 ± 13.05 years (extent: 18-75 years).

49.6% of the respondents live in cities, 24.6% in towns and 25.8% live in villages. Most of them has higher education level (53%), 37.7% has high school final graduation, 6.3% has technical qualification, 2% are workmen and 0.8% has basic education. 60.9% of the respondents have regular job, 22.5% are students, 6.4% are child-raising women. 20.2% of the sample works in an intellectual job, 17.8% has other kind of intellectual job, 28.8% is healthcare worker. Most of them work in a subordinate position (75.8%), an additional 9.3% is self-employed, 6.2% is a middle manager, 5.2% works as team leader and 1.9% works as senior manager. Pensioners (3.5%) and unemployed people (3.3%) also took part in the research. 38.9% of the unemployed people have lost their jobs more than a year ago, 44.4% in the last year and further 16.7% has become unemployed in the last 3 months.

At the time of answering, 23.5% of the asked people have undergone the COVID-19 infection, 30.3% of them were unsure about undergoing it. Most of the people having been infected (45.1%) had mild symptoms, while 52.6% suffered from medium strength symptoms, 0.4% required hospitalization and 0.2% needed intensive care.

When we asked about the wider environment, they reported essentially more infections: the infection could have been detected in all the respondents' households. 37.1% of those living in one household had at least one member and 62.9% had more

than one infected family members. The severity of the course of the infection was different: 12.4% judged it very mild, 54.5% said it was medium, 14% of them needed hospitalization, and the course of the infection was fatal in the environment of 16.6% of the respondents. Examining the wider environment: 14.1% said that there were not infected people among his/her wider family or friends, one infected person could be detected in case of the environment of 14.5%, and more relatives or friends were COVID-19 infected in the case of 71.3% of the respondents. In this group, mild symptoms were reported only in 12.4%, medium strength symptoms could be detected in 54.5%, 14% received hospital treatment, 2.5% received intensive care and 16.6% of the cases were fatal.

At the time of answering, 45.8% of the sample had received a vaccine, 54.2% had not. 61.7% of the respondents had signed up 30.1% had not signed up, and 8.2% had not signed up, but they were planning to do so.

Finally, only 5.5% of the respondents have asked for mental support from a professional in the recent period, most of them, 94.5% have not asked this kind of help. At the same time, 38.2% answered that if they had the chance, they would ask for mental help, while 61.8% of them would not live with this opportunity.

Health anxiety

In case of health anxiety, only a minimal difference could be detected between the two data recording process (Table 1). At the third wave, we experienced the decrease of the anxiety level with a minimally higher dispersion compared to the second wave, while the pandemic was more intensive in the third wave, and the restrictions were stronger than in the previous wave.

	Second wave (Mean)	Third wave (Mean)
Health anxiety	33.84	33.43
SD	7.32	7.62

Table 1: Health anxiety

There was not significant difference in case of the genders ($p>0.15$) (Table 2), but men's anxiety level was higher than in women in data measured in the second wave. This rate turns at the third wave, since at this time, the health anxiety values of women in the sample are higher than men's values.

gender	Second wave		Third wave	
		Health anxiety (Mean)		Health anxiety (Mean)
male	Mean	34.9583		32.7361
female	Mean	33.6163		33.5463

Table 2: Anxiety level by genders

If we examine the change in terms of the residence (Table 3), it can be observed that, however, the difference is not significant ($p > 0.217$), but a tendency-like decrease can be experienced mainly in cities. The level of health anxiety is stronger in villages in the second wave, and the smallest decrease can also be seen there.

Residence	1. Health anxiety (Mean)	health anxiety (Mean)
city	33.9550	32.8500
town	33.7857	33.3254
village	34.2803	33.9848

Table 3: Anxiety level in terms of residence

In case of data measured in the third wave, health anxiety level was significantly higher in families ($p < 0.017$) where there had been COVID-19 - infected person. This phenomenon could not be experienced in data of the second wave.

If the sub-dimensions of health anxiety are examined, the following changes can be observed (Table 4):

	Second wave (Mean)	Third wave (Mean)
Perceived possibility of becoming ill	26.1970	25.8754
Perceived consequence of becoming ill	7.6434	7.5573

Table 4: Sub-scales of health anxiety

The perceived possibility of becoming ill shows a significantly smaller decrease than in the case of perceived consequence. In both waves, the values of health anxiety are higher in people in subjectively satisfactory and bad health state.

The perceived possibility of becoming ill in case of own COVID infection occurred significantly in the second wave ($p < 0.007$). The severity of COVID infections in the family also strongly occurs in the examined sub-dimensions, because the perceived consequence of the disease shows significant difference with the severity of the COVID infection in the family ($p < 0.008$), so, more serious infections in the family increase the value of the sub-scale.

However, in the third wave, the subjective health status is determining at the values of both the perceived possibility of becoming ill ($r = -0.436$) and its consequence ($r = -0.256$) ($p < 0.000002$). So, the worse health status the person perceives, the higher the sub-scale values. The issue of religiousness is also determining, because religiousness is a determining factor ($p = 0.005$) in case of the perceived consequences of the disease.

In terms of the residence, it can be observed that it is a tendency in both pandemic waves ($p>0.18$) that the values of the sub-scales are the highest in the villages (Table 5).

	Second wave		Third wave	
	Perceived possibility of becoming ill	Perceived consequence of becoming ill	Perceived possibility of becoming ill	Perceived consequence of becoming ill
city	26.2900	7.4000	25.4350	7.4050
town	26.2566	7.6711	25.8095	7.5159
village	26.6014	7.7609	26.4318	7.5530

Table 5: Values of the health anxiety sub-scale in terms of the residence

The values of the sub-scales decreased in the third wave, but it could be observed that it was the highest in people living in villages and the decrease was the smallest here.

In terms of genders, no significant deviations can be found ($p>0.28$), but the sub-scale values of the perceived possibility of becoming ill were stronger in women in both waves (Table 6).

	Second wave		Third wave	
	Perceived possibility of becoming ill	Perceived consequence of becoming ill	Perceived possibility of becoming ill	Perceived consequence of becoming ill
male	26.0357	7.7500	25.1528	7.5833
female	26.2161	7.6314	25.9932	7.5530

Table 6: Health anxiety sub-scale values in terms of genders

In the perceived consequence sub-scale, men's values were higher in the second wave, which correlation can be detected in the third wave as well, but less strongly.

Vaccine

At data recording of the third wave, 61.7% of the sample respondents had already registered for vaccination and 45.8% had already received vaccine. 35.8% of the registered people trust in getting the vaccine in a month, according to 22.7%, it will happen in 2-3 months, and 41.5% has no idea about the date. Although, there is not significant difference at the ages ($p>0.67$), but it occurs on a tendency level that the willingness for vaccination is stronger in younger, highly qualified people ($p<0.042$). When examining the willingness for vaccination, no correlations with health anxiety could be found ($r=0.024$).

Healthcare professionals

In the examined sample, the values of healthcare professionals show minimal deviation compared to the population (Table 7).

	Second wave			Third wave		
	Perceived possibility of becoming ill	Perceived consequence of the disease	Health anxiety	Perceived possibility of becoming ill	Perceived consequence of the disease	Health anxiety
Mean	26.8136	8.1780	34.9915	25.6200	7.7533	33.3733

Table 7: Health anxiety values of healthcare professionals

In the second wave, both the healthcare professionals' health anxiety values and the sub-scale values are higher compared to the population, which values show strong decrease in the third wave.

In the third wave, the healthcare professionals' health anxiety values are minimally lower than the population's values. In case of the sub-scales, the values of the sub-scale called "Perceived consequences of the disease" are high than the population's mean.

In the third wave, the values of the sub-scale of perceived possibility of the disease significantly differ in case of the educational level of healthcare professionals ($p < 0.036$). The higher the professional's educational level, the higher the sub-scale values. Health anxiety was highly influenced by the occurrence of the vaccine. In case of the Perceived consequences of the disease sub-scale, a medium strength correlation ($r = 0.377$) can be experienced in case of registration for vaccination. The willingness for vaccination of healthcare professionals with higher qualification occurs more strongly ($p < 0.043$). 37% of the healthcare professionals would like to get mental support in the third wave of the pandemic.

IV. Discussion

Health anxiety is a quite common anxiety type, which is a natural reaction, if we perceive factors endangering our health. Everyone can experience this anxiety type during his/her lifetime, since it is natural to worry about our health. This phenomenon has got more attention nowadays in the uncertain, pandemic-affected socio-economic environment.

Based on the research, the anxiety level is not in connection with gender, age or socio-economic status, but the social and individual uncertainty caused by the pandemic has not emerged so strongly in these studies yet. During our research, we experienced that the level of anxiety in the pandemic period is clearly influenced by the

information available for the population. So, the communication infrastructural channels, which function as an information resource in a certain region, have an essential role. That is why the decrease of the health anxiety level can be felt in the third wave, when the pandemic situation is less unknown for the population, and they have much more information about the virus itself, the protection possibilities, and, not negligibly, hopeful health safety related to the vaccine in this period.

It also emerges from our examination that health anxiety is a process which goes under a continuous transformation in the pandemic situation. Globally, the anxiety level, even if not significantly, but decreases by the prolongation of the pandemic. We measured higher values in people living in villages, where the presence of individual communication information channels occurs presumably more strongly, and perceptions directed to health may be distorted more often.

Infection occurring in the family also influenced positively, so increased health anxiety level.

The anxiety level of healthcare workers shows an increased value compared to the population's value. This increase can be explained clearly by the closeness of the disease and the direct experiences of the effect and outcome of the disease. These values of our research correlate with other studies.

V. Conclusion

The long-lasting COVID-19 pandemic has caused the general increase of the level of health anxiety globally, even if data measured in two waves of the pandemic in our research show subjective decrease. Studies performed in this topic warn for the characteristics of health anxiety related to COVID-19 and its negative consequences expected in the near future. Too high health anxiety level may influence harmfully the individuals' and communities' adaptive reaction for the pandemic, that is why the exploration and monitoring of its level and understanding the influencing factors have become important.

Health anxiety or worry for our health and watching anxiously unusual physical symptoms is adaptive, it is a psychological process and not a disease. Health anxiety has no cure, since it is a natural process, it is completely normal, and everyone experiences it sometimes in a life. Individuals may suffer from its harmful effects in different amount. Some of the problems come from that people been infected earlier start to observe these symptoms increasingly, they catastrophize their physical symptoms which can lead to panic attacks and further mental symptoms. Anxious people monitor the body's signals more intensively, and they tend to enlarge them that may cause intense anxiety. The stress-vulnerability model is valid in all long-lasting stress situations, so in the COVID-19 pandemic as well: if stress increases, symptoms of mental disorders against which the individual was more vulnerable occur or worsen. In this situation, economic difficulties caused by the pandemic, losing a job or the fear from that, durable isolation and loneliness are enough for this,

since these are severe stress factors in their own as well. This can increase the fear from the disease, hospitalization and finally, from death.

The coexistence of the listed factors can cause health anxiety even in people who are basically not tend for it and strengthen the symptoms in people who are tend for it. Therefore, the number of people who need mental help has increased due to the pandemic.

So, learning stress management, conscious content consumption, and more reliable information is essential for everyone to prevent more severe anxiety. Therefore, it worth to raise the attention for the importance of psychoeducation.

This study is part of a complex study that also examines changes in perceived stress, well-being, aggression, and hope during the pandemic period in the affected region. The region has also lagged behind in COVID-19 vaccination, making a further wave of the epidemic likely to induce further research.

References

- [1] Abramowitz, J. S., Deacon, B. J., & Valentiner, D. P. (2007). The Short Health Anxiety Inventory: Psychometric Properties and Construct Validity in a Non-clinical Sample. *Cognitive Therapy and Research*, 31(6), 871–883. <https://doi.org/10.1007/s10608-006-9058-1>
- [2] Asmundson, G. J., & Taylor, S. (2020). How health anxiety influences responses to viral outbreaks like COVID-19: What all decision-makers, health authorities, and health care professionals need to know. *Journal of Anxiety Disorders*, 71, 102211. <https://doi.org/10.1016/j.janxdis.2020.102211>
- [3] Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet*, 395(10227), 912–920. [https://doi.org/10.1016/s0140-6736\(20\)30460-8](https://doi.org/10.1016/s0140-6736(20)30460-8)
- [4] Cao, W., & Li, T. (2020). COVID-19: towards understanding of pathogenesis. *Cell Research*, 30(5), 367–369. <https://doi.org/10.1038/s41422-020-0327-4>
- [5] Csikós, G., Törő, K., Rózsa, S., Hadházi, É., Kövesdi, A., & Földi, R. (2020). Psychological Factors in Hungarian Families under the Coronavirus Pandemic - The Effects of Resilience and Stress on the Wellbeing of Adolescents, Their Interconnections Within The Family, Icms XIII 23rd International Conference on Multidisciplinary Studies: "Resilience For Survival" Cambridge, 30–31 July 2020
- [6] Garbóczy, S., Szemán-Nagy, A., Ahmad, M. S., Harsányi, S., Ocsenás, D., Rekenyi, V., Al-Tammemi, A. B., & Kolozsvári, L. R. (2021). Health anxiety, perceived stress, and coping styles in the shadow of the COVID-19. *BMC Psychology*, 9(1). 53 <https://doi.org/10.1186/s40359-021-00560-3>

- [7] Hedman-Lagerlöf, E., & Axelsson, E. (2019). Assessment of health anxiety. In Hedman-Lagerlöf, E. (Ed.). *Health anxiety: Diagnosis, mechanisms, and effective treatment*. Elsevier
- [8] Kopic, A., Lindholm, P., Järholm, K., Hedman-Lagerlöf, E., & Axelsson, E. (2020). Three decades of increase in health anxiety: Systematic review and meta-analysis of birth cohort changes in university student samples from 1985 to 2017. *Journal of Anxiety Disorders*, 71, 102208. <https://doi.org/10.1016/j.janxdis.2020.102208>
- [9] Köteles, F., Simor, P., & Bárdos, G. (2011). A Rövidített Egészségssorongás-kérdőív (SHAI) magyar verziójának kérdőíves validálása és pszichometriai értékelése = Validation and psychometric evaluation of the Hungarian version of the Short Health Anxiety Inventory (SHAI). *Mentálhigiéné és Pszichoszomatika*, 12(3), 191-213.
- [10] Lakatos, Cs. & Rucska, A. 2021. Észlelt stressz a COVID-19 világjárvány második és harmadik hullámában Észak-Magyarországon. „IX. IRI Társadalomtudományi Konferencia” Marcelová, Szlovákia, 2021.06.10-12. (International Research Institute s.r.o.), 31.
- [11] Li, H., Hafeez, H., & Zaheer, M. A. (2021). COVID-19 and Pretentious Psychological Well-Being of Students: A Threat to Educational Sustainability. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.628003>
- [12] Lvov, D. K., Alkhovsky, S. V., Kolobukhina, L. V., & Burtseva, E. I. (2020). Etiology of epidemic outbreaks COVID-19 in Wuhan, Hubei province, Chinese People Republic associated with 2019-nCoV (*Nidovirales, Coronaviridae, Coronavirinae, Betacoronavirus, Subgenus Sarbecovirus*): lessons of SARS-CoV outbreak. *Problems of Virology, Russian Journal*, 65(1), 6–15. <https://doi.org/10.36233/0507-4088-2020-65-1-6-15>
- [13] Mohd Salleh Sahimi, H., Azman, N., Nik Jaafar, N. R., Mohd Daud, T. I., Baharudin, A., Ismail, A. K., Abdul Malek, A. Z., Hassan, M. R., & Mohammed Nawi, A. (2021). Health Anxiety and Its Correlations with Self-Perceived Risk and Attitude on COVID-19 among Malaysian Healthcare Workers during the Pandemic. *International Journal of Environmental Research and Public Health*, 18(9), 4879. <https://doi.org/10.3390/ijerph18094879>
- [14] Mokhtari, R., Moayedi, S., & Golitaleb, M. (2020). COVID-19 pandemic and health anxiety among nurses of intensive care units. *International Journal of Mental Health Nursing*, 29(6), 1275–1277. <https://doi.org/10.1111/inm.12800>
- [15] Olde Hartman, T. C., Borghuis, M. S., Lucassen, P. L., van de Laar, F. A., Speckens, A. E., & van Weel, C. (2009). Medically unexplained symptoms, somatisation disorder and hypochondriasis: Course and prognosis. A systematic review. *Journal of Psychosomatic Research*, 66(5), 363–377. <https://doi.org/10.1016/j.jpsychores.2008.09.018>
- [16] Pappa, S., Ntella, V., Giannakas, T., Giannakoulis, V. G., Papoutsis, E., & Katsaounou, P. (2020). Prevalence of Depression, Anxiety, and Insomnia

- Among Healthcare Workers During the COVID-19 Pandemic: A Systematic Review and Meta-Analysis. *SSRN Electronic Journal*. Published. <https://doi.org/10.2139/ssrn.3594632>
- [17] Perczel-Forintos D., Ajtay Gy., Barna Cs., Kiss Zs., & Komlósi S. Kérdőívek, becslőskálák a klinikai pszichológiában, Semmelweis Kiadó, Budapest, 2018
- [18] Perge A.; & Veresné Somosi M. (2021) The Issue of Disadvantaged Situation and Pandemic, In: Ekaterine, Gulua; Anantdeep, Singh; Valentina, Chkoniya; Panagiotis, Petrakis; Lara, Burazer (szerk.) 23rd International Congress on Social Sciences, Brussels, Belgium : European Center for Science Education and Research (EUSER) 445 p. pp. 37-45. , 9 p.
- [19] Pfefferbaum, B., & North, C. S. (2020). Mental Health and the Covid-19 Pandemic. *New England Journal of Medicine*, 383(6), 510–512. <https://doi.org/10.1056/nejmp2008017>
- [20] Rucska, A., & Lakatos, Cs. (2021). Stress Reaction in the Population of Northeastern Hungary During the Coronavirus Pandemic In: 23rd International Conference on Education : "Education in the Post-Pandemic Era: From Challenges to Opportunities" 1–13.
- [21] Salkovskis, P. M. (1996). The cognitive approach to anxiety: threat beliefs, safety seeking behaviour, and the special case of health anxiety and obsessions. In *Frontiers of Cognitive Therapy* (ed. P. M. Salkovskis, P. M.), Guilford: New York. 48–74.
- [22] Salkovskis, P., Rimes, K., Warwick, H., & Clark, D. (2002). The Health Anxiety Inventory: development and validation of scales for the measurement of health anxiety and hypochondriasis. *Psychological Medicine*, 32(05). <https://doi.org/10.1017/s0033291702005822>
- [23] Sauer, K. S., Jungmann, S. M., & Witthöft, M. (2020). Emotional and Behavioral Consequences of the COVID-19 Pandemic: The Role of Health Anxiety, Intolerance of Uncertainty, and Distress (In)Tolerance. *International Journal of Environmental Research and Public Health*, 17(19), 7241. <https://doi.org/10.3390/ijerph17197241>
- [24] Serafini, G., Parmigiani, B., Amerio, A., Aguglia, A., Sher, L., & Amore, M. (2020). The psychological impact of COVID-19 on the mental health in the general population. *QJM: An International Journal of Medicine*, 113(8), 531–537. <https://doi.org/10.1093/qjmed/hcaa201>
- [25] Shanafelt, T., Ripp, J., & Trockel, M. (2020). Understanding and Addressing Sources of Anxiety Among Health Care Professionals During the COVID-19 Pandemic. *JAMA*, 323(21), 2133. <https://doi.org/10.1001/jama.2020.5893>
- [26] Tomka, M. A vallásosság mérése. In: Máté-Tóth, A., Jahn, M. (ed.), *Studia religiosa: tanulmányok András Imre 70. születésnapjára*. Szeged, 1998: 18–31.
- [27] Tyrer, P. (2020). COVID -19 health anxiety. *World Psychiatry*, 19(3), 307–308. <https://doi.org/10.1002/wps.20798>

- [28] Wheaton, M. G., Berman, N. C., Franklin, J. C., & Abramowitz, J. S. (2010). Health Anxiety: Latent Structure and Associations with Anxiety-related Psychological Processes in a Student Sample. *Journal of Psychopathology and Behavioral Assessment*, 32(4), 565–574. <https://doi.org/10.1007/s10862-010-9179-4>
- [29] Xiong, J., Lipsitz, O., Nasri, F., Lui, L. M., Gill, H., Phan, L., Chen-Li, D., Iacobucci, M., Ho, R., Majeed, A., & McIntyre, R. S. (2020). Impact of COVID-19 pandemic on mental health in the general population: A systematic review. *Journal of Affective Disorders*, 277, 55–64. <https://doi.org/10.1016/j.jad.2020.08.001>