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# CHANGES OF MENTAL STATUS CHARACTERISTICS AMONG HUNGARIAN ADULTS IN THE YEAR FOLLOWING COVID-19 PANDEMIC

# ZMIANY CECH STANU PSYCHICZNEGO WŚRÓD DOROSŁYCH WĘGRÓW W ROK PO PANDEMII COVID-19

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B. Data collection/entry
zebranie danych
C. Data analysis/statistics
dane – analiza i statystyki
D. Data interpretation
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E. Preparation of manuscript
przygotowanie artykułu
F. Literature analysis/search
wyszukiwanie i analiza literatury
G. Funds collection
zebranie funduszy

**Summary**

**Background.** The negative effects of the COVID-19 pandemic on mental health are still present today and are the subject of international research. The present cross-sectional quantitative study aimed to assess depression, anxiety and stress as well as mental health and well-being among Hungarian adults.
**Material and methods.** The online survey study consisted of two data collections: the first survey was conducted in the spring of 2022 with the participation of 482 adults, while the second survey was performed in the spring of 2023 with 1157 adults. The questionnaire contained questions on socio-demographic data, about subjective mental status and characteristics of mental health.
**Results.** During the one year passed since the last pandemic wave, mitigation of the symptoms of depression and stress and the worsening of anxiety symptoms was observed among the Hungarian adult population. A slight improvement of emotional and psychological well-being but a mild deterioration of social well-being was experienced in the same timeframe in the year following the pandemic.
**Conclusions.** Long-term monitoring of the population's mental status is justified, and the attention of professionals working in the field of mental health improvement is again directed to the necessity of prevention and intervention programs targeting vulnerable groups.

**Keywords:** DASS-21, emotional well-being, psychological well-being, COVID-19 pandemic, mental health

**Streszczenie**

**Wprowadzenie.** Negatywne z punktu widzenia zdrowia psychicznego skutki pandemii COVID-19 nadal są obecne i pozostają przedmiotem międzynarodowych badań. Niniejsze ilościowe badanie przekrojowe miało na celu ocenę depresji, lęku i stresu, a także zdrowia psychicznego i dobrostanu u dorosłych Węgrów.
**Materiał i metody.** Przeprowadzone przez Internet badanie ankietowe składało się z dwóch zbiorów danych: pierwsze badanie przeprowadzono wiosną 2022 r. z udziałem 482 osób dorosłych, a drugie badanie przeprowadzono wiosną 2023 r. z udziałem 1157 osób dorosłych. Kwestionariusz zawierał pytania dotyczące danych społeczno-demograficznych, subiektywnego stanu psychicznego i charakterystyki zdrowia psychicznego.
**Wyniki.** W ciągu roku od ostatniej fali pandemii zaobserwowano złagodzenie objawów depresji i stresu oraz pogorszenie objawów lękowych wśród dorosłej populacji Węgier. W tym samym okresie w roku następującym po pandemii odnotowano niewielką poprawę w zakresie dobrostanu emocjonalnego i psychicznego, ale również łagodne pogorszenie dobrostanu społecznego.
**Wnioski.** Długoterminowe monitorowanie stanu psychicznego populacji jest uzasadnione, a uwaga specjalistów zajmujących się dziedziną poprawy zdrowia psychicznego jest ponownie skierowana na konieczność wdrożenia programów profilaktycznych i interwencyjnych ukierunkowanych na szczególnie wrażliwe grupy.

**Słowa kluczowe:** DASS-21, dobrostan emocjonalny, dobrostan psychiczny, pandemia COVID-19, zdrowie psychiczne

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**Introduction**

The COVID-19 pandemic posed such a medical, economic, physical and mental hygienic challenge to the humanity that it caused severe damage in terms of people's mental health and well-being [1-3]. The changed living conditions were associated with the worsening of the symptoms of depression, perceived stress and anxiety, and the exacerbation of using psychoactive drugs worldwide [4-6]. It has also become obvious by now that the passing of acute danger, the end of the pandemic, has not meant the return to the economic, social and mental situation prior the pandemic, as the damages in the physical, mental and social life are still present among the population. This is also confirmed by the statement of the World Health Organization (WHO) on the effects of COVID-19 on mental health, according to which the prevalence of anxiety and depression has increased by 25% worldwide since the outbreak of the pandemic [7]. The reduction in social relationships, the fear of becoming ill and the endangerment of jobs being the most prominent risk factors of the pandemic, caused an increase of the feeling of being unsafe, heightened intolerance to uncertainty, increased psychological inflexibility and the increase of stand-by mode [8-10]. These factors together have caused the exacerbation of the population's stress reactions, and the initial acute stress has been transformed to chronic stress. As long-lasting stress of even mild intensity has an essential role in the development of both somatic and mental disorders and has effects on subjective health status, it is justified to monitor the severe and long-lasting stress reactions caused by the pandemic among the population [4,11,12]. However, it is also worth keeping in mind during studying the mental effects of the pandemic that people experience and evaluate the same experience or life situation in very different ways, and the response triggered by a certain stressor basically differs between the certain individuals and can even be completely opposite [13,14]. So, the psychological reactions following traumatic events are not one-sided responses which occur as a template in all sufferers, but they are rather complex, multi-faceted phenomena, thus positive mental reactions may also occur besides the negative ones. According to experience, not only collapse, or survival with permanent damage, but recovery and flourishing are also possible after such a traumatic life event, provided certain conditions are fulfilled [15].

The dual continuum model of mental health [16] describes positive mental health in the aspects of both hedonic (emotional well-being) and eudaimonic (psychological and social) well-being, and it emphasizes that optimal functioning is possible only when together with the social well-being aspects. Emotional well-being is the sum total of the presence of positive emotions (such as good mood and happiness), the lack of negative ones (i.e., hopelessness), and the emotional-based evaluation of the quality of the person's own life (satisfaction with life). Psychological well-being can be described in six dimensions: self-acceptance, positive relationships with others, autonomy, the sense of efficiency in the environment, goals, and personal growth. In Keyes' conception, subjective well-being includes the "public functions" of the living environment as well. In this framework, social well-being means the evaluation of a given person's social conditions and how he/she functions at community levels. A socially integrated person is characterized by social integration, social acceptance, social contribution, social actualization and social coherence. People with the most excellent mental functioning experience a high level of emotional, psychological and social well-being, and are free from mental illness symptoms [17].

The assessment of the Hungarian population's mental health status was launched at the beginning of the COVID-19 pandemic, and surveys were performed multiple times. During the study series, we monitored and followed the changes of the levels of stress, health anxiety, aggression, hope and mental well-being in the second, third, fourth and fifth waves of the pandemic. Our results have been reported in different national and international studies in which the population's mental health is shown to be below the average [4,11,12].

The aim of the research was the assessment of the long-term effects of the pandemic on mental health and monitoring the possible changes among the Hungarian population. We intended to examine the correlations of depression, anxiety, stress and mental health with socio-demographic data. In this study, we assumed a negative

correlation between depression, stress and mental health (H1). Significant difference was assumed between the anxiety level of the genders: we assumed higher anxiety level in women than men (H2). We also assumed improvement in the dimensions of mental health in the period elapsing between the first and the second data collection (H3).

## Material and methods

### *Study design*

The online quantitative cross-sectional study was performed in Miskolc, Hungary in two periods. Some data were collected in the spring of 2022, directly after the last wave of the COVID-19 pandemic, while the second data collection was performed in the spring of 2023, one year after the end of the pandemic.

### *Data collection and sampling*

Data collection was performed by convenience sampling using the "snowball method" both times. The questionnaire was shared in professional groups and on social websites, and we asked people to share it as well as fill it in. The only inclusion criterion was for a respondent to be over the age of 18. At the first data collection, 482 persons (n=482; mean age: 33.05±15.1) completed the questionnaire, and 1157 persons (n=1157; mean age 36.10±14.6) completed it at the second data collection. The descriptive statistics of the studied people can be seen/read in Table 1.

**Table 1.** Demographic data of the sample

| Demographic data | First survey (n=482) | Second survey (n=1157) |
|---|---|---|
| **Mean age (years)** | 33.05±15.1 | 36.10±14.6 |
| **By gender (%)** | | |
| **Male** | 34.4 | 30.3 |
| **Female** | 65.6 | 69.7 |
| **Residence (%)** | | |
| **Capital** | 11.6 | 10.7 |
| **City** | 38.8 | 31.7 |
| **Town** | 24.1 | 31.1 |
| **Village** | 22.2 | 25.2 |
| **No data** | 3.3 | 1.3 |
| **The highest educational level (%)** | | |
| **8 years of primary school or less** | 3.9 | 2.2 |
| **Vocational school** | 10.0 | 7.1 |
| **Graduation** | 46.5 | 40.5 |
| **Technical school** | 10.0 | 11.0 |
| **Higher education** | 26.3 | 38.1 |
| **No data** | 3.3 | 1.0 |
| **Rate of people living in the same household (%)** | | |
| **I live alone** | 17.0 | 16.2 |
| **I live with my partner/husband/wife** | 18.5 | 24.3 |
| **I live in a family (partner/husband/ wife+children)** | 39.6 | 41.6 |
| **I live in a large family (family+parents)** | 21.0 | 15.2 |
| **No data** | 3.9 | 2.7 |

### *Test methods*

The respondents were informed about the goal and method of the research at the beginning of the questionnaire, that participation was voluntary and that filling in the questionnaire could be stopped at any time if they chose to do so. No questions suitable for identification were included; respondents who filled in the questionnaire remained anonymous. The respondents signaled their agreement to participate in the study by selecting the appropriate answer at the beginning of the questionnaire.

Besides the demographic features, two validated questionnaires targeting the measurement of mental health characteristics were used in the questionnaire: the Depression, Anxiety and Stress Scale (DASS-21) [18] and the Mental Health Continuum – Short Form (MHC-SF) [18]. The assessment of socio-demographic features was furthered by questions about gender, age, residence, family status, social cohabitation and workplace status. One question measured the evaluation of the respondent's own health status: "What do you think about your health in general?" There were five answer options from "very bad" to "excellent". We used the same questionnaire at both data recordings.

### *Questionnaires used*

*Depression, Anxiety and Stress Scale (DASS-21)*

The Depression, Anxiety and Stress Scale created and standardized by Lovibond and Lovibond [18] is aimed at the assessment of affective symptoms, and it ensures the distinguishability of basic depressive and anxiety symptoms. The shortened version of the scale containing 21 items (DASS-21) measures the dimensions of depression, anxiety and stress by 7-7 items; respondents must decide the extent to which each statement was applicable to them in the week prior to the survey. The given items should be evaluated on a 4-point Likert scale (0 = Did not apply to me at all, 3 = Applied to me very much or most of the time). According to the manual, the resulting ratings then are classified as: normal, mild, moderate, severe, or extremely severe. Although the detailed psychometric analysis of the scale has not yet been performed on a Hungarian sample, it has been used in several national studies, and both the complete scale and its subscales have shown acceptable internal reliability [19]. The Cronbach's alpha value of the measuring tool is 0.86 on both study samples.

*Mental Health Continuum – Short Form (MHC-SF)*

The 14 items of the Mental Health Continuum – Short Form (MHC-SF) standardized by Keyes et al. [20] is aimed at the assessment of the level of individual well-being. The respondents must answer how they have felt in the last month, i.e., how often they have experienced the feeling or process described in each item. Answers can be selected on a 6-point Likert scale (0=never; 5=every day). Overall, the questionnaire assesses the respondent's own judgement about how often he/she has experienced the feeling or process in the last month. While the total score of the answers apply to the global well-being, the scores of the certain subscales refer to the given fields of subjective well-being: emotional, psychological and social well-being. The total score of the complete questionnaire can be between 0 and 70, the higher score always indicates a higher level of well-being. The Hungarian adaptation of the scale was made by Melinda Reinhardt [21]. The Cronbach's alpha value of the measuring tool on the current study samples is 0.84 and 0.83.

*Data privacy and ethical considerations*

All the respondents were volunteers, and the questionnaires were anonymized. The research was licensed by the Regional/Institutional Committee of Science and Research Ethics (IG-50-258/2019).

*Statistical reporting*

All statistical analyses were performed by using SPSS 22.0 software and the *p*-value was set at 0.05. In a measurement database, over descriptive statistics, we used chi square test and Pearson correlation test for the examination of the correlations. We used the Mann-Whitney test for the examination between the databases (between the databases of two different waves). Kolmogorov-Smirnov and Shapiro-Wilk tests were used for the normality examination.

## Results

*Depression, anxiety, and stress*

Regarding the DASS-21 total value of the depression, anxiety and stress scale, the respondents' DASS-21 percentile mean was in the normal range at the time of both data recording ($x_1$=21.9; x=20.5) (Table 2). In case of both data collections, the DASS-21 percentile Kolmogorov-Smirnov and Shapiro-Wilk tests results showed significant values ($p$<0.05). The Mann-Whitney U test did not show significant difference (U=5.5; $p$=0.2), so, there was no significant difference between the results of the two data recording.

**Table 2.** Mean of the Depression, Anxiety and Stress scales and the subscales

| DASS-21 | Mean score I. Data Collection n=482 | Mean score II. Data Collection n=1157 | Mean score difference |
|---|---|---|---|
| **Total scale** | 21.9 | 20.5 | -1.4 |
| **Depression** | 7.18±5.65 | 5.90±5.1 | -1.28 |
| **Anxiety** | 5.78±5.33 | 6.10±4.6 | +0.32 |
| **Stress** | 8.97±5.24 | 8.18±5.0 | -0.79 |

However, based on data of the two surveys, the levels of depression and stress showed decreases and the level of anxiety showed a slight increase (Table 3).

**Table 3.** Rates of the DASS-21 subscales above the normal value

| DASS-21 | I. Data Collection n=482 | | | II. Data Collection n=1157 | | |
|---|---|---|---|---|---|---|
| **Subscales** | **Depression** | **Anxiety** | **Stress** | **Depression** | **Anxiety** | **Stress** |
| **Prevalence above the normal value (%)** | +31.5% | +32.3% | +17.6% | +22.5% | +33.4% | +13.3% |

The distribution of the sample according to the severity of depression symptoms at the time of the first survey: symptoms suggestive of mild depression occurred in 12.5%, moderate in 9.2%, and severe in 1%. At the time of the second survey, we measured mild depression in case of 13.7% of the respondents, moderate in 16.9% and severe depression in an additional 0.9%.

Examining it in terms of educational level, depression showed significant correlation ($p$<0.05; $p$<0.001) in both surveys: lower educational level was associated with higher depression values. The lowest depression mean was experienced among the population with higher education.

According to the Mann-Whitney U test, there was no significant decrease in the level of depression (U=61; $p$=0.5), nor was a significant increase in the level of anxiety (U=60.5; $p$=0.2) (Table 4).

**Table 4.** Correlations of the two data collections of Depression, Anxiety, and Stress scales

| DASS-21 | Mann-Whitney U test* | Significance level* |
|---|---|---|
| **Total scale** | 5.5 | 0.2 |
| **Depression** | 61 | 0.5 |
| **Anxiety** | 60.5 | 0.2 |
| **Stress** | 21.5 | 0.5 |

Notes: *The results should be interpreted in a 95% confidence interval.

Based on the answers of both data collections, no significant deviations can be detected. The strongest deviation can be experienced in case of the level of stress (U=21.5). Examined by chi square test, gender did not show significant correlation with the level of depression at either of the surveys ($p_1$>0.65; $p_2$>0.099). During the second data recording, social relationships and depression showed a correlation ($p$<0.001): a markedly higher depression level was measured in people living alone than those living in extended families (Table 5). The correlation was not significant in case of the first survey ($p$>0.05).

**Table 5.** Mean of depression scale in the dimension of social cohabitation

| With whom do you live in the same household? | Depression mean score I. Data Collection n=482 | Depression mean score II. Data Collection n=1157 |
|---|---|---|
| **I live alone** | 8.01±6.1 | 7.09±5.7 |
| **I live with my partner/husband/wife** | 6.42±5.5 | 6.03±5.0 |
| **I live in a family (partner/husband/wife + children)** | 6.44±5.4 | 5.31±4.9 |
| **I live in a large family (family + parents)** | 8.24±5.5 | 5.99±5.1 |

The mean value of the anxiety subdimension is in the normal range at both data collections (Table 2). The distribution of the sample according to the severity of anxiety at the first survey: mild anxiety condition was shown in 8.6%, moderate in 15%, severe in 7.1%, and very severe in 1.7%. At the second survey, 11.2% showed mild, 16.4% moderate, 5% severe and 0.7% showed very severe anxiety condition. Age ($p$<0.05; $p$<0.001) and gender ($p$<0.001) showed significant correlation with anxiety at both data collections: younger women were affected at a higher rate.

Significant correlation could be found between the subjective health status ($p$<0.001), educational level and anxiety ($p$<0.001): the anxiety level of people showing worse health status and those with lower educational level was higher compared to the mean of the whole sample.

Residence did not show significant correlation with the level of anxiety at either of the surveys ($p$>0.05).

The mean value of the stress subscale is also in the normal range (Table 2). At the first survey, 13.1% of the sample showed mild and 4.5% showed moderate stress level, while 10.2% of the sample showed mild and 3.1% showed moderate stress level at the time of the second survey. At both surveys, age ($p$<0.001) and gender ($p$<0.001) showed significant correlation with the level of stress: women showed higher stress level than men, and younger women were more stressed than those in the older age groups.

Examined by the chi square test, residence did not show significant correlation with the level of stress at either of the surveys ($p_1$>0.210; $p_2$>0.216). In case of the first data collection, stress level was higher among people living in cities (40%), while at the second data collection, anxiety was reported by respondents living in towns as well as by respondents living in cities (31.7%).

Skilled workers (x=7.2) and people living in a partnership (x=8.1) are the least stressed. At the second data collection, both educational level ($p$<0.05) and the presence of family relationships ($p$<0.05) showed significant

correlation with the stress level. In this sample, people with higher educational level (x=7.6) and people with family (x=7.7) were the least stressed.

*Mental health*

The mental health scale used in this study was aimed at the exploration of the components of subjective well-being. The scale measures the positive components of mental health along three dimensions: the fields of emotional, social, and psychological well-being (Table 6). Emotional well-being consists of satisfaction with life, positive emotions, happiness, and the lack of negative feelings. Social well-being comprise social acceptance, social fulfilment, social contributions, social coherence and integration, while psychological well-being comprises self-acceptance, the feeling of personal growth, life goals, the sense of efficiency, autonomy and positive relationship with other people. The total score reached in the complete questionnaire ranges between 0 and 70 points. The higher score indicates a better mental well-being value.

**Table 6.** Mean of dimensions of mental health in the total sample and in terms of genders

| Mental well-being | | Mean of total score | | Emotional well-being | | Psychological well-being | | Social well-being | |
|---|---|---|---|---|---|---|---|---|---|
| | | I. Data n=482 | II. Data n=1157 | I. Data n=482 | II. Data n=1157 | I. Data n=482 | II. Data n=1157 | I. Data n=482 | II. Data n=1157 |
| Total sample | Mean | 32.69 | 33.96 | 7.66 | 8.13 | 15.24 | 16.13 | 9.79 | 9.70 |
| | SD | 11.81 | 11.09 | 3.16 | 3.03 | 5.68 | 5.35 | 4.71 | 4.50 |
| Male | Mean | 31.34 | 33.42 | 7.56 | 8.17 | 14.56 | 15.89 | 9.23 | 9.37 |
| | SD | 12.60 | 11.54 | 3.30 | 3.07 | 6.09 | 5.53 | 4.93 | 4.68 |
| Female | Mean | 32.83 | 34.19 | 7.72 | 8.12 | 15.43 | 16.23 | 9.96 | 9.84 |
| | SD | 11.21 | 10.89 | 3.09 | 3.01 | 5.33 | 5.27 | 4.61 | 4.42 |

The mean of mental health of the examined sample is below the threshold value (35) of the scale (x=32.69±11.8; x=33.96±11.1). The Mann-Whitney U test did not show significant decrease (U=20.5; $p$=0.5), but the U value suggests more marked difference. Examining the subscales, the lowest values were found in the social well-being of the sample (x=9.79±4.71; x=9.7±4.5), which is far below the threshold value.

At the first survey, emotional and psychological well-being were around the threshold value, while at the second data collection, both values were only slightly above the threshold value.

Using the chi square test, educational level showed correlation with mental well-being at both data collections ($p$<0.05) as a higher educational level was associated with a higher level of mental health, so, higher educational level served as a protective factor in the examined sample.

Although no significant differences were found in case of gender ($p$>0.05), women generally showed better mental status than men: while the emotional well-being dimension was almost the same in terms of gender, better values were found in women with respect to psychological and emotional well-being (Table 6).

The Mann-Whitney U test did not show significant deviations in case of either components, but the strongest change was shown for psychological well-being (U=52), and the least change occurred for emotional well-being (U=330.5) (Table 7).

**Table 7.** Correlations of the two data collections of the mental health dimension scale

| Mental well-being | Total scale value | Emotional well-being | Psychological well-being | Social well-being |
|---|---|---|---|---|
| **Mann-Whitney U test*** | 20.5 | 330.5 | 52 | 70.5 |
| **Significance value*** | 0.5 | 0.7 | 0.07 | 0.9 |

Notes: *The results should be interpreted in a 95% confidence interval.

As the results of the Kolmogorov-Smirnov and Shapiro-Wilk tests showed a significant value ($p$<0.05), we used Spearman's correlation at the correlation studies. We found at both surveys that the aggregated mental health dimensions show negative correlation with the aggregated value of the depression, anxiety and stress scale (r=-0.36; r=-0.43, $p$<0.01). At the level of subscales, a correlation manifested between depression and emotional and psychological well-being. At the first data collection, depression and emotional well-being showed moderately strong inverse correlation (r=-0.42, $p$<0.001), while depression and psychological well-being showed weak inverse correlation (r=-0.37, $p$<0.001). At the second data collection, the same correlation manifested more strongly in the inverse combination of depression and emotional well-being (r=-0.52, $p$<0.001), and depression and psychological well-being (r=-0.48). No such correlations were found between the other subscales ($p$>0.05).

During the first data collection, the strongest correlation could be experienced in terms of depression: it showed inverse correlation with both emotional (r=-0.42) and psychological well-being (r=-0.37). At the second data collection, the same correlation could be found at a slightly stronger level: the inverse association of emotional well-being with depression (r=-0.52), and psychological well-being with depression (r=-0.48).

Finally, we found at both surveys that family and a style of life characterized by a multigenerational family household occur as a protective factor for mental health status ($p$<0.05; $p$<0.001) (Table 8).

**Table 8.** Mean of dimensions of mental health in the total sample and in terms of gender

| People living in the same household | MHC-SF mean score I. Data Collection | MHC-SF mean score II. Data Collection |
|---|---|---|
| **Living alone** | 30.33±13.6 | 31.29±11.8 |
| **Living with his/her partner/husband/wife** | 33.34±12.0 | 33.26±10.6 |
| **Living in a family (partner/husband/ wife + children)** | 33.03±11.0 | 35.16±10.5 |
| **Living in a large family (family + parents)** | 33.30±10.9 | 34.04±11.1 |

*Health status*

The subjective health status of the respondents participating in the data collection shows positive change between the two data collections, because the rate of those who think their condition bad decreased, even if slightly, and the rate of people feeling satisfactory and good health status increased. The rate of people in very good health condition shows a decrease (Figure 1).

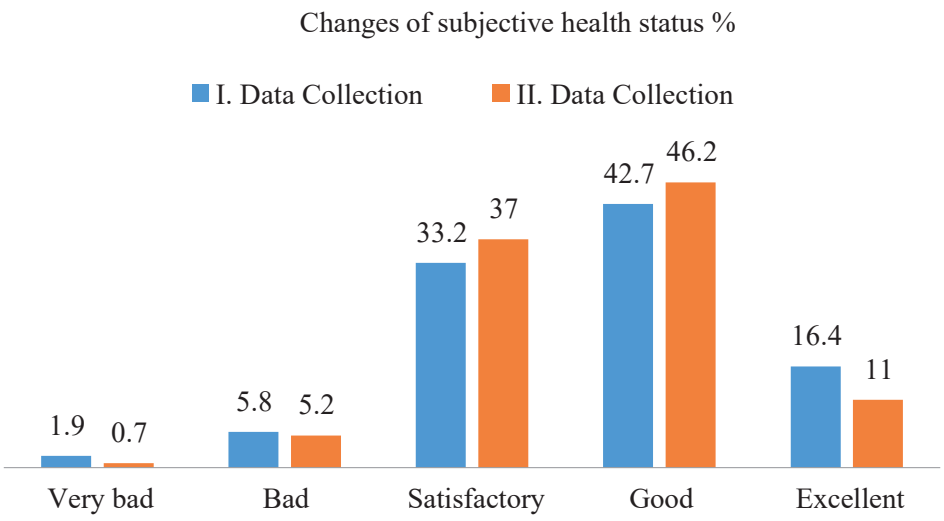


**Figure 1.** Changes of subjective health status at the two data collections

In the two independent samples (K-S test $p<0.000$), regarding the subjective judgement of health status, the Mann-Whitney U test did not show significant differences (U=320.5; $p=0.5$), so, there was no significant difference between the two samples. The chi square test showed significant relationship between age and subjective health status during both the first ($p<0.001$) and second survey ($p<0.001$). The elder age group (over the age of 40 on average) judges its health status markedly worse than the younger age group.

## Discussion

This current study presents the data of a study series launched at the beginning of the COVID-19 pandemic with the aim of assessing the Hungarian population's mental health status and following the possible changes. During the COVID-19 pandemic, compared to the period prior the pandemic, the increase of the level of depression, anxiety and post-traumatic stress could be experienced in several countries, and so in Hungary as well [1-3,22]. As depression and anxiety mean increased risk from early death and they present a significant health burden on both individual and social levels, our study was partly aimed at the assessment of these symptoms. At the same time, besides the mental illness symptoms, we also considered it important to map the symptoms of mental health as another, similarly important field of the health of soul [20].

In our surveys performed among the Hungarian population, the aggregated data indicated the presence of symptoms suggestive of mild depression and moderate anxiety. At the same time, comparing the data of the examined sample with the data of the survey performed on a Hungarian sample before the pandemic [21], the increase of the level of depression, anxiety and stress corresponds with the previous national and international study data [1-3,22]. One of the most significant differences between the results of the two surveys we performed could be seen in the change of the levels of depressive, anxiety, and stress symptoms. While the level of depression and stress showed a slight decrease, the level of anxiety (i.e., vegetative arousal, situational anxiety) showed moderate increase. The latter indicates a psychological condition consisting of a feeling of fear bound to restlessness, worry and a sense of helplessness. The subscales of the questionnaire used in the study are not suitable for establishing a diagnosis in and of themselves, rather they indicate tendencies only. We suppose the long-lasting social and economic effects of the pandemic and the other geopolitical effects (i.e., the prolonged war in the neighboring country) in the background of the mental illness symptoms. From the aspect of the usefulness of the revealed results, the question emerges whether what kind of endangering and protecting factors should be considered in connection with the certain symptoms significantly influencing

the quality of life. Educational level and the number of family members living together showed correlation with the severity of depressive symptoms: a lower educational level and living alone are associated with the risk of the more severe manifestation of the symptoms. Regarding the anxiety symptoms, the younger age group and women within it were affected the most. From the aspect of the manifestation of stress symptoms, younger people, women, people with less education and those living alone are the most vulnerable groups. The explanation of the results may be that as the consequence of the restrictions introduced due to the pandemic, the economic uncertainty had more negative effects on younger people whose financial situation was more uncertain than that of older people. This is more emphasized in case of people with a lower education level, who are more exposed to negative economic changes. Compared to men, the more marked presence of anxiety symptoms in women is known from the surveys performed before the pandemic, and the current results confirm the existence of this correlation. Therefore, the results raise the question that the pandemic may have caused further condition deterioration in people having underlying psychiatric problems, and the economic and financial difficulties and the restricting measures could have even more negative effects on the mental health of certain social groups than in case of others [22].

Regarding the level of mental health, compared to the previous measurements, a markedly worse image was revealed in our study: we found values below the Hungarian population's mean in case of both surveys [21]. The lowest values were found in the population's social well-being which was far below the threshold value, but emotional and psychological well-being were only slightly above the threshold value as well. From the aspect of mental health symptoms, in accordance with previous research, a higher educational level, family, and lifestyle in multi-generational family households were shown to be the strongest protective factors as well. Although in case of the second survey we found a slight improvement in mental well-being, this occurred only with respect to emotional and psychological well-being, and it remained far below the optimal level. Social well-being means the evaluation of a person's social conditions and how the person functions on social levels. Its components are social acceptance, social contribution, social coherence, and social integration [18,19,22], and a limited operation experienced in these fields is associated with a kind of social and individual uncertainty where the person's social connections are hurt. In our study, the slight deterioration of the level of social well-being is surprising on the one hand, given that a year has passed since the last pandemic wave, epidemiological concerns no longer limit social relationships. On the other hand, a correlation is supposed between the strengthening of anxiety symptoms and the deterioration of social well-being, since anxiety symptoms may be associated with isolation and the limitation of social relationships, therefore a mutual correlation can be assumed to exist between them. Finally, corresponding to the results of prior comparative studies [21], based on our results it could be stated that mental health symptoms were in inverse correlation with the level of depression, anxiety and stress. In our study, this correlation manifested most emphatically in the inverse concurrence of emotional and psychological well-being and depression.

Among the Hungarian population, helping the affected groups to improve their mental health would be important in the future because of the slow and partial improvement of the mental health indicators after the COVID-19 pandemic. One condition of this is the psycho-social support of individuals and families, and the ensuring of a wider availability of psychological help.

*Limitations*

On the one hand, the limitation of our study is that we cannot infer causality from our data because of the cross-sectional design. On the other hand, the non-representative sample limits our ability to apply our results to the entire Hungarian adult population.

**Conclusions**

1. Based on data found in the international literature, it can be stated that the prevalence of depression, anxiety and stress reactions has increased worldwide since the outbreak of the COVID-19 pandemic, and the indicators of mental health have significantly deteriorated.
2. It reveals from the study performed among the Hungarian population that the effects of the COVID-19 pandemic on mental health have not ceased by the end of the pandemic.
3. During the one year passed since the last pandemic wave, the mitigation of the symptoms of depression and stress and the elevation of anxiety symptoms could be observed among the Hungarian adult population.
4. The level of mental well-being is still below the Hungarian average measured before the pandemic. The slight improvement of emotional and psychological well-being, but slight deterioration of social well-being at the same time, was experienced in the year following the pandemic.
5. The results draw the attention of the professionals and decision-makers working in the field of mental health improvement again to the necessity of prevention and intervention programs targeting the vulnerable groups.

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