



Review

INDIVIDUAL STRATEGIES FOR MITIGATING HEALTH RISK UNDER HIGH EPIDEMIOLOGICAL HAZARD (REVIEW OF FOREIGN STUDIES)

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The COVID-19 pandemic created elevated risks for life and health of overwhelming majority of people all over the world. The situation called for global restructuring of activities performed by social institutions as well as for adaptation of people's routine behaviors to this new reality. Common people faced a serious challenge of selecting an optimal self-preservation model that would allow achieving the maximum possible mitigation of health risks. This review covers empirical foreign studies with their focus on people's health-related behavior during the COVID-19 pandemic with its aim being to identify different types of individual strategies for health risk mitigation.

During the pandemic, protective behavior was influenced by social, cultural, sociodemographic, and individual and personality-related factors. Effects of micro-factors (age or education) could be different depending on a country. High healthcare literacy was a factor of selecting a protective behavior model regardless of any other characteristics.

We can spot out three basic strategies for mitigating health risks under high epidemiological hazard: 1) a maximum protection strategy involving adherence to most medical recommendations on prevention of the coronavirus infection; 2) a dominating protection strategy that involves adherence to some basic recommendations (face mask wearing, frequent hand washing, and self-isolation); 3) a mixed strategy that includes periodical adherence to some recommendations on prevention of the infection, on the one hand, and some risky behaviors, on the other hand.

Behavior strategies aimed at mental health protection are various and include, for example, those that are oriented at social networks as much as only possible (a strategy involving search for emotional support or an attempt to keep social contacts), as well as isolation strategies and deviant strategies.

Some studies covered in the review suggest ways to consider peculiarities of individual and family behavior during the pandemics when solving tasks related to risks of infections spread in future.

Keywords: pandemic, health risks, self-protective behavior, health-related behavior, coronavirus infection, risk mitigation strategies, maximum protection strategy, dominating protection strategy.

On May 05, 2023 T. Ghebreyesus, the Director-General of the World Health Organization (WHO), declared the COVID-19 pandemic to be officially over¹ thus summing up a more than 3-year period of this topic hitting headlines all over the world. The COVID-19 pandemic has become the most serious challenge for the whole humankind in the 21st century; it is an integral part of the historical context now, along with several other natural regulators of the global population such as pandemic outbreaks of plague, leprosy, cholera, and Spanish flue [1]. According to the

WHO global report, the COVID-19 pandemic caused 14.9 million additional deaths in 2020–2021 and resulted in 336.8 million of lost years of life worldwide².

Lifestyles had to be changed globally due to anti-epidemic measures introduced by most countries; as a result, a customary worldview turned out to be fragile and vulnerable in the face of invisible and obscure danger. This process stimulates thinking about humans' place, role, and capabilities within the system of their interaction with the world around.

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¹ WHO Director-General's opening remarks at the media briefing – 5 May 2023. *WHO*. Available at: <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing---5-may-2023> (September 01, 2023).

² World health statistics 2023: monitoring health for the SDGs, sustainable development goals: Global report. *WHO*, 2023. Available at: <https://www.who.int/publications/i/item/9789240074323> (September 01, 2023).

This pandemic has become a striking example of what negative consequences globalization might have thereby providing its opponents with new arguments and starting new discussions in scientific and common discourse [2]. The speed of the virus spread all over the world has clearly shown strength of social connections and density of economic, cultural, and political interdependencies in the global society. Hazards created by the virus persuaded the world it was necessary to combine efforts to fight against the common danger together, at least, for a while.

Social and political aspects of the pandemic have become apparent through selecting specific anti-epidemic procedures introduced in a whole state, starting from total isolation and severe sanctions for breaching it as it was in China and down to efforts to naturally achieve something like ‘collective immunity’ under minimal social restrictions and with relatively slow vaccination. Different models of fighting against the COVID-19 pandemic had different effects in population incidence and mortality [3].

The pandemic has again attracted the humankind attention to social inequality as a global issue by showing greater vulnerability to the infection among people from traditionally deprived social groups and countries, which are underdeveloped socially and economically [4].

From the very first days of the pandemic, the COVID-19 virus turned out to have an astonishing ability to potentiate hazards posed by already existing health issues, which, in an ordinary situation, would only create some minor difficulties in patients’ lives. Such diagnoses as obesity or diabetes mellitus, when they were combined with the coronavirus infection, turned into a powerful health risk factor that could cause a patient’s death or result in a very severe disease, complicated treatment and unfavorable outcome [5, 6]. Since some effective mechanisms of public aid were absent, personal responsibility for one’s health became such an acute problem as never before. Understanding that the issue was complex in its essence facilitated occurrence of fundamentally

new health protective patterns as regards not only the COVID-19 itself but any concomitant diseases as well.

The aim of this study was to identify types of individual strategies aimed at mitigating health risks and adopted by population under high epidemiological hazard. We are making an effort to answer several questions relying on the results of foreign studies in the process. How did the COVID-19 pandemic change self-protective behavior worldwide? To what extent did medical recommendations on prevention of the disease become a part of a new lifestyle? What social and demographic variables had the greatest effects on readiness to follow risk-mitigating recommendations and vice versa? And, finally, what classical and modern theories of self-protective behavior turned out to be the most relevant for explaining these processes?

In our opinion, a very important circumstance should be highlighted since it makes this challenge more difficult than it appears at first. Despite severe global consequences, the pandemic has still turned out to be a quite rapid, many-aspect, and many-sided process. Results derived by studies that were accomplished during the first stages in the pandemic can be totally different from those obtained at some later stages when a level of a perceived risk has become significantly higher and studies have become more fundamental.

Social and demographic factors that determine protective behavior. The theory of planned behavior by I. Ajzen [7] was selected by foreign researchers as the basic conceptual scheme. By using it, they were able to explain individual choices as regards a strategy for health risk mitigation, transformation of a lifestyle, and adherence to healthcare recommendations during the pandemic. Perceived behavioral control, the key category within this concept, reflects the subjective complexity of adherence to various healthcare recommendations and ultimately determines a behavioral pattern. Subjective norms, behavior accepted in a social setting, and cultural peculiarities of a specific society are other variables that contribute to formation of such patterns. Individ-

ual adherence to prevention behavior and analysis of factors that promote its formation became the first and the most significant research challenge within healthcare sociology under the pandemic.

Since the COVID-19 infection was a respiratory one, this made it possible to create clear and universal recommendations on how to prevent it from spreading. They included face mask wearing, frequent hand sanitation, regular disinfection of surfaces, use of sanitizers, avoiding touching one's face, hiding one's face into the bend of elbow when coughing, keeping a proper social distance, and staying home when infected³. Although the recommendations were really clear and quite simple, adherence to them turned out to be rather problematic. For example, long-term keeping of a social distance or social isolation can be rather challenging since people tend to adapt to risks, fight against loneliness and try to return to their ordinary lifestyles thereby refusing to observe protective measures [8].

A research team from two research centers in Florida, USA, made an effort to investigate a connection between perceived behavioral control, attitudes, and subjective norms, and whether people used all the aforementioned prevention measures in their everyday life [9]. The authors made several very interesting conclusions that confirmed basic conceptual postulates of the theory of planned behavior. First of all, they again mentioned a more significant role that belonged to behavioral control in formation of most components of preventive behavior against individual attitudes and influences exerted by social settings. In practical terms, this means that some effective measures would include removing barriers that make adherence to recommendations more difficult or emphasizing easier ways of participating in specific preventive behavior. The most obvious examples are automatic hand sanitizers that can be found everywhere and face masks distributed free of charge.

Age has become a variable able to influence adherence to preventive behavior. Just as expected, people from older age groups were more responsible in comparison with younger ones as regards the majority of the recommended behavioral models. A study that was conducted in the USA on a national sample of adult population in the first half of 2020 showed that people aged 60 years and older followed the basic recommendations authentically more frequently (wearing a mask, washing of hands, and social distancing) than people of younger ages [10]. Data obtained by a sociological survey in spring 2020 in Germany showed that responsible healthcare behavior was more likely to be adopted by older respondents but still there was a certain decrease in readiness to keep social distance and adhere to personal hygiene [11]. A study conducted in late 2020 – early 2021 in Greece established that people from younger age groups (18–30 years) more often denied the validity of scientific data and mass media reports about COVID-19 and this resulted in less responsible behavior [12].

Among other social and demographic factors of protective behavior, attention should also be paid to gender-related one: women and girls are traditionally more prone to protective health behavior during the pandemic [13]. Obviously, the persistent gender-related effect exists in any age group as regards preventive behaviors [14]. A possible interpretation could be different personality characteristics, namely, women tend to score higher than men on agreeableness and conscientiousness, and to be more willing to comply with a set of protective health behaviors [15]. Differences in the gender contract and peculiar social roles of men and women can be another possible explanation. For example, women in general tend to be neater and cleaner, take care of sick people more often and therefore adopt more serious attitudes towards safety precautions; women spend more time at home and, consequently, have fewer social contacts, adapt to self-isolation more rapidly and easier, etc. This means that

³ COVID-19 Treatment Guidelines Panel. Coronavirus Disease 2019 (COVID-19) Treatment Guidelines. *National Institutes of Health*. Available at: <https://www.covid19treatmentguidelines.nih.gov/> (September 05, 2023).

it may be necessary to conduct more targeted information campaigns for men and boys who are traditionally more prone to risky behaviors and tend to underestimate hazard.

Understanding one's individual susceptibility to COVID-19 turned out to be a significant factor determining formation of protective health behavior. A study conducted in late 2020 in Germany established several factors able to create elevated risks; an age older than 50 years (33 %) and an existing basic disease (32 %) were mentioned more frequently. Obviously, all the respondents had high levels of adherence to recommended safety precautions. It was especially true for avoiding direct social contacts; refusing parties, trips or handshakes; keeping social distance and wearing a face mask (each behavior scored higher than 88 %) [16]. Overall, high levels of compliance with infection control measures were identified in other studies conducted in Germany [17].

Choice of a behavioral strategy during the pandemic was also determined by fear of the disease and trust in information sources [18]. An international study conducted in West European countries and the USA during the first pandemic wave established that COVID-19 worry was authentically associated with selecting a protective behavior strategy. Self-efficacy had a much more substantial effect on individual behavior; it was described with self-estimation of competence and ability to act [19]. Overall, health literacy (awareness) was considered the key competence and the mandatory condition for understanding and estimating COVID-19-related instructions provided by healthcare organizations and workers; the ability to use them in everyday practices to control and prevent the infection; as well as protection of one's own physical and mental health and health of close relatives and friends. High health literacy was also a significant factor able to produce positive effects on vaccination [20].

Some foreign studies provide certain data on high health literacy with respect to preventing and treating COVID-19 both by a population in general and by some specific social and

occupational groups [21]. Results of a survey conducted in Germany in spring 2020 indicate that up to 80 % of the respondents believed they were very well or well informed about the pandemic [22]. It was very easy or easy for these citizens, from their subjective point of view, to behave in such a way so that they did not infect other people, to understand government instructions on how to protect themselves from the coronavirus, to estimate measures that protected from the infection and behavioral models that created the highest health risks for them, and to make decisions on how to protect themselves from the coronavirus infection relying on information provided in mass media [23]. On the one hand, these results were quite expected considering universal spread of health information in mass media, research articles, and everyday discourse. On the other hand, these results can be considered unreliably optimistic due to two circumstances typical for similar surveys. First, the pandemic had no equal as an event facilitating popularity of online surveys, which became the basic way to collect empirical data. Consequently, the analyzed sample did not include people without access to the Internet. And if we bear in mind that elderly people are obviously expected to prevail among them, we should accept the fact that a very important information block, which concerned the most vulnerable social and demographic group, was neglected by the analysis. Second, the reported data were self-estimations in their essence and did not show how knowledge was transformed into routine behavior.

Extreme presentation of the pandemic and protective health behavior in mass media (social media included) had certain drawbacks, first of all, information overload of audiences [24]. In addition to that, uncertainty grew among people whose health literacy was low. Deficit of health knowledge prevented them from adequate or critical perception of information and created controversial strategies of protective health behavior. Thus, a survey conducted among people in Germany established that most respondents who believed they were well aware of COVID-19-

related issues either did not have any concerns about risks of infection or had very few whereas low concerns were typically mentioned by only 19 % of those respondents who were rather poorly informed of the matter [23]. This regularity seems universal and is not either gender- or age-dependent. Health literacy that helps estimate and use information correctly can be eligible for eliminating this difference. It is worth noting that different sources of information can have different influence on adherence to them and diagnostics of communication channel effectiveness becomes a separate important task.

Individual and personal factors of protective health behavior. People are different as regards concern, readiness, and expectations in an emergency; they have different levels of conscientiousness and responsibility. Knowing how a personality reveals itself during a complicated epidemic situation can help predicting behavior under future outbreaks of communicable diseases and provide relevant recommendations for executive authorities on how to develop effective advice considering individual peculiarities.

The five-factor model of personality (FFM) is the most popular theoretical framework for factoring of the entire variety of personal traits, mostly due to its relative simplicity. The model was developed by conducting some series of studies as far back as 1960ties [25]. The model inserts the personality into the system of five basic coordinates; two of them, namely ‘Self-control – Impulsivity’ and ‘Emotionality – Calmness’ are of direct interest within our subject. Conscientiousness is a trait on the first axis and neuroticism is one on the second. It is these traits that are considered basic personality determinants responsible for formation of attitudes towards a disease and protective health behavior [26].

It seems quite logical to assume that people with high conscientiousness take more safety precautions to avoid getting infected with the coronavirus. This conclusion is consistent with data reported in several studies with their focus on health behavior [27], including those focused on COVID-19

prevention. Since conscientiousness is characterized by orderliness, responsibility, impulse control, and self-discipline, people who score high with respect to this trait are more likely to comply with recommendations on safety precautions. People with high scores on extraversion are not prone to estimate duration of the pandemic pessimistically, have sufficient reserves of internal energy, and assess their life and health more positively. It is noteworthy that higher extraversion was also established to be associated with higher concern and it seems to contradict to the aforementioned facts. However, any concerns about the pandemic should not be considered equal to pessimism; to some extent, they can be a justified rational reaction to an objective hazard. The latter circumstance can also occur due to a high correlation between conscientiousness and extraversion, which becomes apparent, among other things, through taking care of family and friends.

Neuroticism reflects proneness to irritation, anger, sadness, concern, anxiety, and hostility. No wonder, that people with high neuroticism reported strong concerns and were pessimistic in their estimates of the COVID-19 pandemic duration [28]. People high in neuroticism have more chronic negative emotions, react to psychological traumatic experiences especially acutely and largely rely on emotion regulation strategies [29]. Despite their overall hypochondriac orientation, people high in neuroticism adhere to fewer safety precautions. However, this is due to elevated proneness to depression that is typical for them, since some studies on COVID-19 report that higher neuroticism was associated with a tendency to keep social distancing and hygienic behavior, for example, hand washing and avoiding touching the face.

A conclusion on the role that belongs to the ethnic factor in formation of behavioral strategies under the pandemic became an important fact typical for the American research. African Americans and Hispanics tended to have greater concerns and relevant readiness to take more precautions [30].

Whites, on the contrary, turned out to be more careless as regards four aspects of the pandemic: concerns, precautions, COVID-19 duration estimates, and preparatory behavior; the latter meant stocking foods or medications to reduce the need to go out during the isolation period. This also correlates with lower social and economic adaptation and wellbeing of the aforementioned ethnical groups, which makes them more responsible under a global crisis [31].

The sociological approach stimulates authors to look for regularities of influence individual psychological traits may have on behavioral patterns in any other hazardous situations. Neurotic reactions are counter-productive just as conscientiousness, fair practices and optimism are useful, and this is obvious and universal in any critical situation. However, similar studies with their focus on factors that shape protective behavioral patterns under the pandemic (or any other global crisis) highlight the idea that individual and psychological peculiarities will unavoidably have lesser role in distribution of data in future. In other words, personality traits cease to be those variables that determine behavioral peculiarities of specific social and other groups in the face of grave dangers threatening a population as a whole.

Role of the family in selecting a risk mitigation strategy. Family support had the key role in choices of protective strategies made by an individual during the COVID-19 pandemic. Studies that were conducted in various periods of the pandemic in North America, Western Europe, and Asia established that support provided by family, relatives, and friends authentically increased likelihood that an individual would choose protective health behavior [32–34]. An interstate study accomplished in summer 2020 on a representative sample made of 6990 people showed that support provided by ‘significant others’ was a more substantial determinant of choosing health-protective behavior than sex, socioeconomic status, health state, and concerns about the pandemic [35]. A survey conducted among Israeli adolescents during the

first (April 2020) and the second (September 2020) lockdown established that risk-inducing behavior (alcohol abuse, tobacco and marijuana smoking) was more typical for children from families with weak family support [36].

It was rather difficult for families to implement social support functions effectively due to unavoidable intra-family transformations associated with the pandemic. Due to anti-epidemic measures, primarily self-isolation and quarantine, families were forced to change their ordinary life, redistribute roles and revise interactions inside the system and contacts with the outer world. The fact that any family was to some extent influenced by the pandemic is obvious at least due to the complexity of family systems, variety of family sub-institutions, intra-family roles and interactions and each family being a unique small social group. The basic questions here are how exactly they were influenced; what sub-institutions and sub-systems were affected the most and the least; and what factors caused the observable effects.

Positive experience of intra-family functioning prior to the pandemic is the key factor that determines positive adaptation of a given family to COVID-19. Such families tend to score high in mental health and internal integration, which provides adequate ability to adapt under uncertainty and chaos. It is these concepts taken from the family stress theory that are usually applied by foreign researchers to describe reactions of family systems to isolation and emotional state of their members [37]. Forced confinement to a closed space, disrupted connections with the outer world, unemployment, and a decrease in living standards could not fail to induce changes in the balance of authority relations, statuses, and roles, education processes, and quality of parent-child and sister-brother relationships. This called for re-adjusting all the components in the family systems, which, in its turn, led to responses by sub-systems and individuals, from reserved acceptance to blunt protest [38, 39].

Within the health protection context, it should be noted that these circumstances cause elevated parental stress, depression and con-

cern. This may create risks of mental disorders and use of psychoactive drugs not only by parents but by adolescents and young students as well. Adolescents also had elevated risks of mental disorders due to weaker support provided by their counterparts and loneliness during the pandemic [40]. Telemedicine and other distant consulting were deemed promising under these new conditions; however, prospects of their use also turned out to be rather ambiguous. At present, new data are reported in some studies that such interventions that rely on technologies and do not provide direct contacts are not effective in working with socially challenged population groups. Therefore, it is necessary to adapt telemedicine services for families in difficult situations to avoid aggravating the existing disparity in access to healthcare. This includes providing access to relevant technologies.

Dynamics of family violence is another significant indicator that describes family health within the pandemic context [41]. It can be considered a destructive but rather expected reaction to family disorganization when any potential conventional means of harmonization have been depleted but the problem has not been solved yet. Universal nature of family violence, that is, absence of any binding to specific risk groups, and its occurrence in any social layer makes it a very sensitive indicator of family stress levels. Comparative analysis of its dynamics during the pandemic and prior to it makes it possible to illustrate influence exerted by anti-epidemic measures on family stress levels [42].

The gender-specific approach, which is typical for western scientific research, considers women and children primary victims of family violence; therefore, other family members rather rarely appear in this context. Statistical analysis of complaints about family violence revealed that the number of complaints about domestic abuse of a spouse grew during the quarantine but the number of complaints about violence towards chil-

dren went down. The latter is most likely due to a reduction in contacts between children and employees of organizations responsible for detecting infringements of civil rights and activating various mechanisms of social protection.

Two recommendations were the most widely spread in the analyzed studies. First, it was necessary to provide digital access to services; and second, to develop skills of education and healthcare experts as regards using online platforms to identify signs of family violence. It was also recommended to provide better training and funding for workers of psychiatric and social services to effectively prevent family violence, especially during the pandemic. However, let us again highlight the necessity to employ a differentiated approach to using digital technologies and providing equal access to online services for various social groups.

Mental health protection strategies. The necessity to change customary lifestyles, destruction of traditional work or study regimes, forced self-isolation, and confinement to a closed space with the same people for several weeks or even months became a grave challenge for human psyche. This called for selecting effective strategies aimed at mental health protection. According to the WHO reports, prevalence of anxiety disorders and depression grew by 25 % worldwide during the first year of the COVID-19 pandemic⁴.

The pandemic can be described in dynamics by changes in its stages: the beginning, crisis, lockdown, re-orientation and the new reality. Each stage has its typical dominating psychological experiences. Thus, German researchers reported the highest generalized anxiety at the lockdown stage since 10 % of the respondents mentioned the symptom being rather severe and this was by far higher than prior to the pandemic. Depression occurred at all stages in the pandemic until the new reality was formed; its levels grew from 5.6 to 22 % [43].

⁴ COVID-19 pandemic triggers 25 % increase in prevalence of anxiety and depression worldwide. *WHO*. Available at: <https://www.who.int/news/item/02-03-2022-covid-19-pandemic-triggers-25-increase-in-prevalence-of-anxiety-and-depression-worldwide> (September 05, 2023).

According to the US Centers for Disease Control and Prevention, as of June 2020, almost one third of adults in the country suffered from anxiety or depression [44]. These levels were almost twofold among older male adolescents, that is, the social group with prevalence of mental disorders already growing significantly in it over the last decade. More than 60 % of people aged between 18 and 24 years were susceptible to depression or anxiety and one fourth of them reported they had been thinking about suicide during the previous month. These estimates give evidence of a considerable growth in depression since its prevalence was about 11 % among adults and about 25 % among American college students prior to the pandemic in 2019.

This rise in prevalence of depression occurred immediately after such safety precautions as social distancing and self-isolation had been introduced. They led to a drastic change in physical activity, sleep, and leisure, especially at the beginning of the pandemic in March and April 2020 against uncertain prospects of the disease spread and unknown duration of forced self-isolation. It was noted that risks of depression were considerably higher for students who had to study during the pandemic adhering to anti-epidemic measures than for their counterparts from previous cohorts [45]. This gives evidence that the pandemic was able to intensify the relationship between maintaining customary lifestyles and mental health. It is noteworthy that an experiment was conducted when a group of students returned to their former levels of physical activity for one and a half month; as a result, their mental health did not improve [46]. This fact may indicate that physical activity does not have any intrinsic value but is rather a form of social interaction that was almost completely shut down by anti-epidemic restrictions. Switching to distance learning also

made its contribution to risks for physical and mental health since it aggravated a decrease in physical activity and intensified communicative deprivation even when the actual and virtual reality came closer to each other. The only positive result that can be mentioned here is that these data outline some promising trends in future research with its focus on mental health recovery.

Another obvious assumption is that an association between physical activity and subjective wellbeing is primarily determined by the initial level of mental health and not by a lifestyle. That is, changes in physical activity, duration of sleep or behavioral models of spending free time as such can be early symptoms of depression. Moreover, both physical activity and mental disorders can be determined by basic reactions to the pandemic. In other words, people who are able to keep their customary lifestyle during the pandemic have been more resistant to stress and less prone to anxiety prior to it.

International organizations developed recommendations on how to protect mental health for specific social groups. The United Nations Office for the Coordination of Humanitarian Affairs developed a Guide on Psychological Support for Older Adults during the COVID-19 pandemic⁵; UNICEF, recommendations for adolescents on how to protect mental health in this new reality⁶. Recommendations covered, for example, proper sleep-wakefulness patterns, relaxation, meditation, adherence to information hygiene, and socializing and communication with family and friends. A study conducted in May 2020 in the USA established that the top three strategies to cope with COVID-19 with respect to mental health included acceptance, self-distraction, and use of emotional support [47]. Behavioral detachment, use of psychoactive drugs, and denial were less popular.

⁵ Living with the Times, A Mental Health and Psychosocial Support Toolkit for Older Adults During the COVID-19 Pandemic. *Inter-Agency Standing Committee: OCHA Service*. Available at: <https://interagencystandingcommittee.org/iasc-reference-group-mental-health-and-psychosocial-support-emergency-settings/living-times-mental-health-and-psychosocial-support-toolkit-older-adults-during-covid-19-pandemic> (September 07, 2023).

⁶ How to protect your mental health during the coronavirus (COVID-19) pandemic: 6 strategies for teenagers faced with the new (temporary) situation. *UNICEF, Serbia*. Available at: <https://www.unicef.org/serbia/en/how-protect-your-mental-health-during-coronavirus-covid-19-pandemic> (September 07, 2023).

A survey conducted in Australia found that positive thinking, active stress coping and social support were significant factors for mental health protection [48]. A study conducted between March and August 2020 established four basic coping strategies (problem-focused, emotion-focused, avoidant, and socially-supportive) adopted by the respondents. Of them, the socially-supportive coping was associated with a faster decrease in anxiety and depressive symptoms [49].

To summarize various behavioral patterns typically chosen by people during the COVID-19 pandemic, we can spot out several risk mitigation strategies. The first one is the maximum protection strategy involving adherence to most medical recommendations on prevention of the coronavirus infection (wearing a face mask and gloves, social distancing, strict self-isolation during a lockdown, vaccination, etc.). The strategy can have some variations that are largely determined by culture. For example, a comparative study of behavior adopted in Germany and Japan during the first pandemic year revealed that people in both countries were highly committed to health-protective behavior. In Germany, however, a significantly higher proportion washed their hands frequently and avoided crowds, physical contact, public transport, peak-hour shopping, and contact with the elderly. In Japan, a significantly higher proportion was willing to be vaccinated [50]. The second one is the dominating protection strategy that involves adherence to some basic recommendations (face mask wearing, frequent hand washing, and self-isolation): a survey conducted in China in early 2020 established that it was this strategy that most people adhered to during the first phase in the pandemic [51]. A cross-national study accomplished in Western and Southern Europe revealed that frequent hand washing and face mask wearing integrated into people's routine behavior the most rapidly [52]. A variation of this strategy was adherence to basic prevention together with refusal from vaccination. At the same time, vaccination against the coronavirus infection reduced a level of person's adherence to health-

protective practices [53]. The third one is the mixed strategy that includes periodical adherence to some recommendations on prevention of the infection, on the one hand, and some risky behaviors, on the other hand. Thus, an online US national study conducted in August – October 2020 established that 12 % of the respondents 'always' or 'often' disinfected their hands and wore face masks but also 'always' or 'often' failed to keep self-isolation, went shopping, or visited their friends or relatives [54]. Finally, we should mention COVID-19 denialism as a specific behavioral strategy as regards COVID-19-related risks. The strategy is based on denying the very existence of the coronavirus infection and / or scales of its hazards and prevalence [55]. Choice of this strategy is associated with individual health literacy (awareness) and trust in various sources of information.

Conclusion. Our analysis of studies conducted in various countries during the COVID-19 pandemic revealed several variable individual strategies aimed at health risk mitigation, from responsible health-protective behavior to risk-inducing one associated with COVID-19 denial and low trust in information about mandatory prevention measures. Factors that determine choice of an individual behavioral strategy can be divided into a) social and demographic ones (sex, age, ethnicity, place of residence, self-assessment of infection risks, and health status); b) social and psychological (anxiety, neuroticism, and conscientiousness); c) micro-social (social support and information involvement). Family and its successful adaptation to new functioning conditions also play a significant role in determining strategic choice of health-protective behavior.

On the one hand, a situation that involves high epidemiological hazards creates risks of communicable diseases; on the other hand, it creates high levels of anxiety in people since it is always an uncertainty factor. Implemented anti-epidemic measures can be an additional source of stress due to involved changes in everyday life. Orientation at social support and emotional help provided by significant others,

first of all, family, is the most effective strategy aimed at mitigating risks for mental health under such situations.

Multiple studies that investigate behavioral peculiarities of various social groups during the COVID-19 pandemic provide great opportunities for mitigating risks of communicable diseases in future. It seems advisable to do several things. First, we should create an integral system for sanitary education of population, raise health literacy, and provide operative health risk communications. Second, there should be targeted efforts aimed at forming adherence to self-protective behavior in risk groups who do not have sufficient resources to

resist a disease. Third, we should develop certain mechanisms of strengthening family connections and prevent family ill-being as an additional risk health risk factor under a stressful epidemiological situation.

Limitations of the study. The review covers only full-text publications in English and German languages that report empirical research results.

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