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Knowledge and attitudes towards the COVID-19 pandemic: dependence on information sources among obstetrics and gynaecology department patients

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ABSTRACT

During the COVID-19 pandemic, one of the most significant challenges was the transfer of information about the disease and preventive measures. This study aimed to evaluate the common knowledge about COVID-19 among our patients and examine the factors influencing how information about the pandemic was received. The study involved 235 women admitted to the Department of Obstetrics and Gynaecology at Pomeranian Medical University in Szczecin, Poland, in May 2021. They completed a single-choice questionnaire covering the transmission, risks, and prevention of SARS-CoV-2 infection, disease management, vaccination, and preferred information sources. Most answers were correct, with no significant difference between television and Internet users. Health information campaign organizers should consider various factors affecting the transfer of health data.

Keywords: COVID-19; pandemic; SARS-CoV-2; infection.

INTRODUCTION

In early 2020, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), imported from China, spread worldwide, causing unprecedented morbidity and mortality across populations and triggering social, economic, and political crisis [1, 2, 3, 4, 5, 6, 7]. On March 11th, 2020, the World Health Organization (WHO) declared coronavirus disease 2019 (COVID-19) a global pandemic. On April 3, 2020, the United States (US) Center for Disease Control and Prevention (CDC) recommended mandatory social distancing and face mask-wearing in public [8].

Faced with the potential collapse of health service systems, European governments implemented various regulations and restrictions to reduce the prevalence of infection. The new social coexistence rules were disseminated through various information channels, including conservative media like radio, television (TV), and newspapers, as well as modern platforms like the Internet. The COVID-19 information campaign also utilized billboards, leaflets, and posters to maximize outreach [5, 8, 9, 10, 11, 12, 13, 14].

The topic was widely discussed in society as it affected everyone's lives. As a result, "coronavirus" was chosen as the 2020 Word of the Year in Poland by both a panel of professional linguists and public voters in the 10th edition of the Word of the Year contest organized by the University of Warsaw Institute of Polish Language and the Polish Language Foundation [15].

Unfortunately, an effective drug against COVID-19 has not yet been developed [2]. Almost half a year after the introduction of COVID-19 vaccination in Poland – since the first dose was administered on December 27, 2020 – we decided to investigate the knowledge and attitudes towards SARS-CoV-2 among our department's patients.

The purpose of this study was to evaluate the common knowledge about COVID-19 among our patients, which may indirectly illustrate the effectiveness of information transfer through various channels, and to review the factors affecting the reception of information about the pandemic and its practical application.

MATERIALS AND METHODS

The study involved 235 patients admitted to the Department of Obstetrics and Gynaecology at Pomeranian Medical University in Szczecin, Poland, in May 2021. They were given a single-choice questionnaire consisting of 10 questions. The 10th question focused on preferred sources of information, while the other questions assessed the patients' knowledge about the transmission, risks, and prevention of SARS-CoV-2 infection, as well as disease management and vaccination (full version of the questionnaire available).

RESULTS

Most of the answers to the questions asked were correct. The highest percentage of correct answers, 97.47%, was for the 8th question, which tested knowledge about quarantine. The lowest percentage of correct answers, 71.03%, was for the 9th question, which tested knowledge about the symptom of infection that requires immediate contact with a medical professional (Fig. 1, 2).

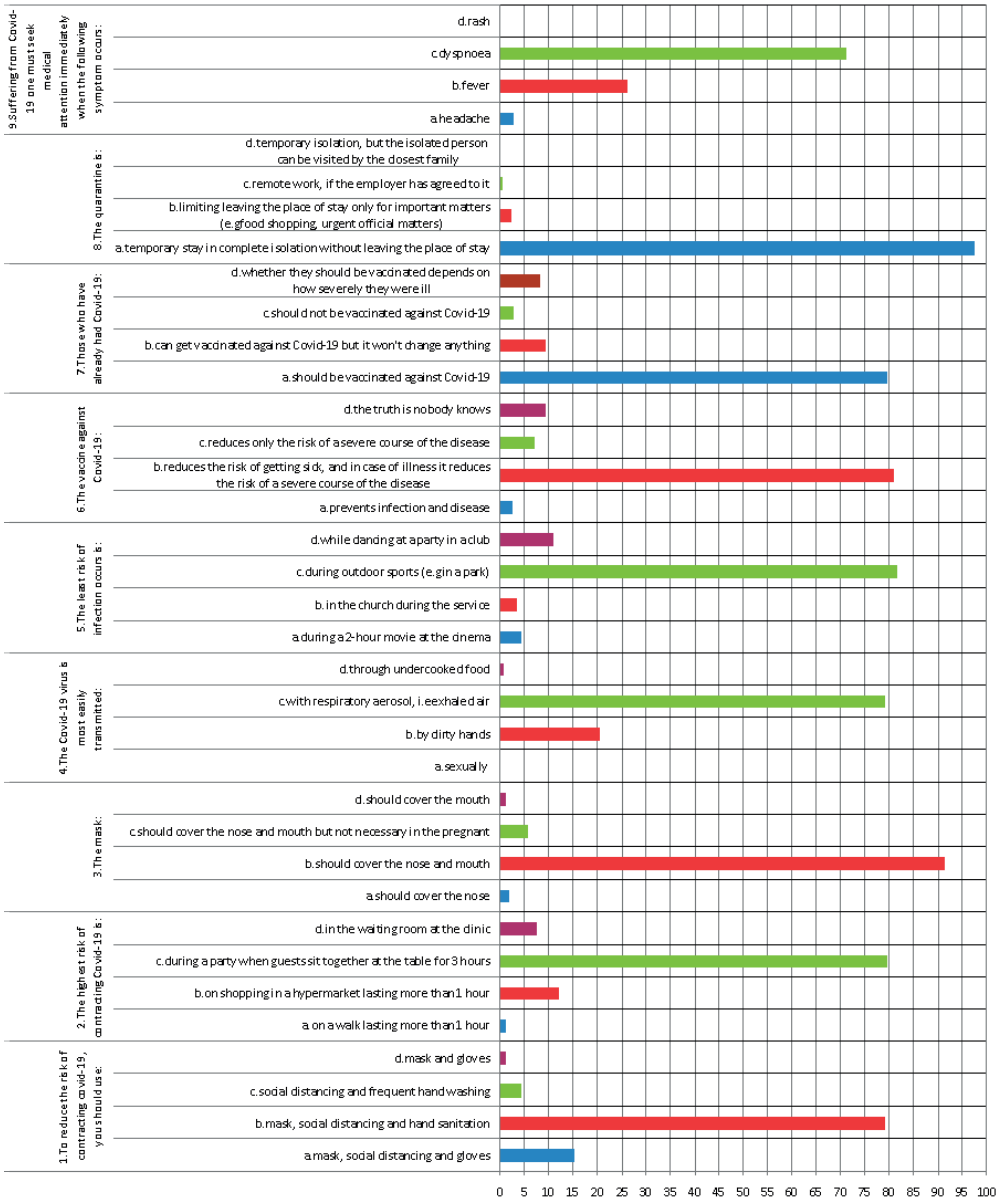

FIGURE 1. Distribution of answers to survey questions

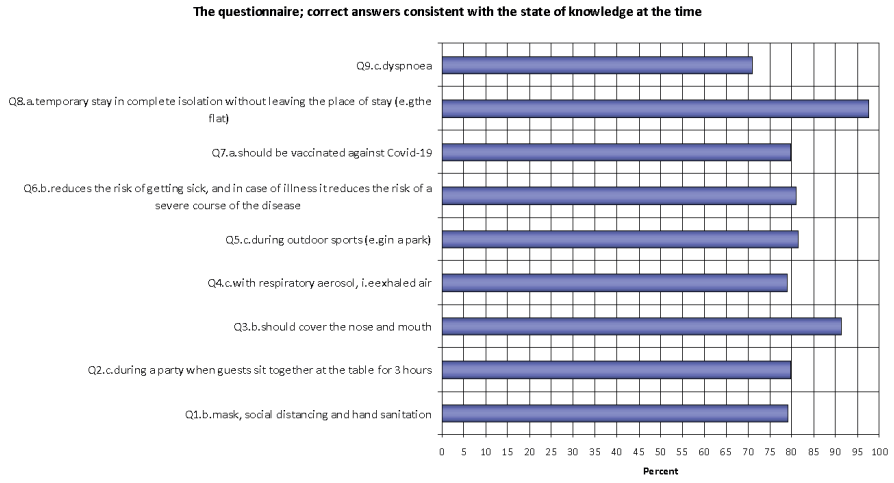

FIGURE 2. Correct answers consistent with the state of knowledge at the time

53.08% of the respondents declared that the main source of their knowledge about COVID-19 was the Internet. 27.7% obtained information mainly from TV, 2.05% from friends, and 17.12% used other sources, as shown in the chart below (Fig. 3).

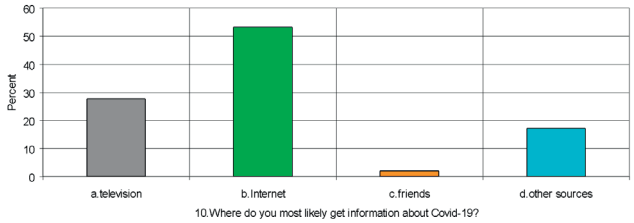

FIGURE 3. Declared sources of knowledge

Among the participants who gave the correct answers, those who obtained their knowledge from the Internet and TV significantly dominated over those who gained information from friends (p = 0.03786). The relationships between the frequency of correct answers and the sources of COVID-19 knowledge are presented in Figures 3 and 4.

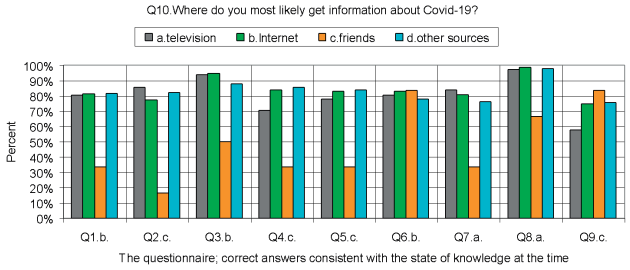

FIGURE 4. Correct answers according to the source of information

For the 8th question about quarantine, the group of respondents who learned from their friends gave statistically significantly (p = 0.00001) the most incorrect answers. This group performed significantly worse compared to all other groups, with a 96% lower chance of a correct response, OR 0.04 (0.01–0.24).

For the 9th question about the symptom indicating the need for immediate medical consultation, the fewest correct answers were received. However, the differences between the individual groups were not statistically significant.

All dependencies in the structure of answers for questions 1 through 9, based on the sources of information, are presented in Figures 5, 6, 7, 8.

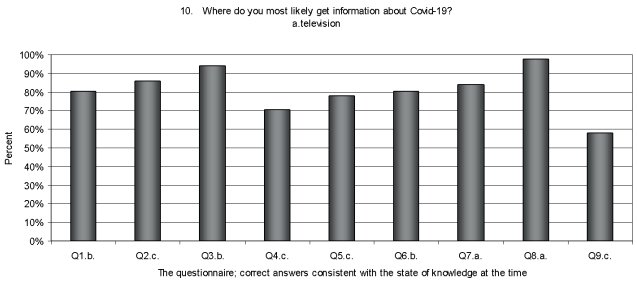

FIGURE 5. Correct answers among respondents who obtained information from television

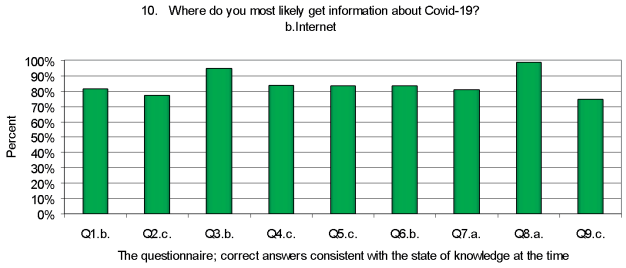

FIGURE 6. Correct answers among respondents who obtained information from the Internet

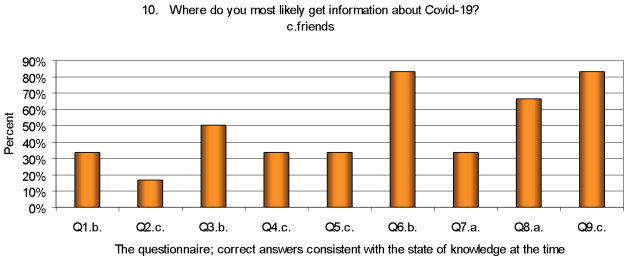

FIGURE 7. Correct answers among respondents who obtained their information mostly from friends

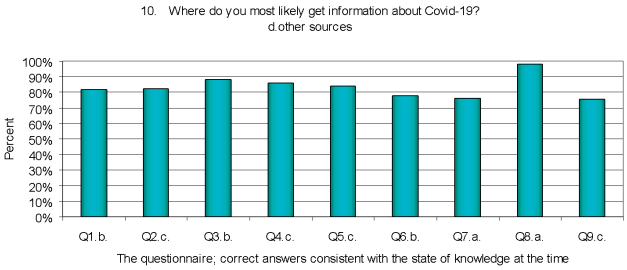

FIGURE 8. Correct answers among respondents who declared other sources of information

DISCUSSION

We decided to distinguish the concepts of knowledge, defined as having particular information, from attitude, which refers to practical compliance with implemented restrictions. We emphasized that the answers given in our questionnaire were only a form of patients' declarations, not necessarily reflective of their actual practices. The most characteristic illustration of this difference was the majority of patients in our admission room who declared being aware of the necessity of covering their mouth and nose with a facemask but wore their facemasks under their nose or chin due to discomfort.

Graeber et al. noticed gender differences in people's attitudes toward different pandemic measures: women were skeptical about vaccination, while men were less likely to practice preventive behaviors, despite reports showing more severe COVID-19 effects among male patients [16].

Most of our participants showed adequate knowledge about COVID-19, providing correct answers to the survey questions, which is similar to the results from El-Far Cardo et al. [13].

The least accurate answers came from a small subgroup who learned mostly from their friends rather than from the media.

Non-pharmaceutical interventions

Non-pharmaceutical interventions are effective in limiting the spread of infections transmitted through contact, droplets, and aerosols. Preventive strategies were essential before vaccination was introduced [7]. Modeling analysis by Jo et al. indicated that social distancing prolonged to 4 months, in case of low testing intensity for COVID-19 and vaccination uptake, can significantly reduce epidemic resurgence and intensive care unit (ICU) demand, working as a controlling factor for virus transmission [17].

MacIntyre et al. presented the most common measures declared by their respondents early in the pandemic, such as: avoiding crowded places, public transport and shops, practicing hand hygiene, wearing facemasks, physical distancing, restricting visitors, reducing visits to medical facilities, and avoiding contact with sick people. These limitations seemed to be common-sense actions, understandable to the public [18].

Martini and Lippi remind us that hand hygiene, the legacy of historical figures like Ignaz Semmelweis and Florence Nightingale, still requires intensive promotion as a fundamental principle of preventing the spread of infectious diseases [19].

A systematic review and meta-analysis by Talic et al. showed a reduction in the incidence of COVID-19 through hand washing, facemask wearing, and physical distancing [7].

Most of our survey participants gave correct answers to questions 1–5 about non-pharmaceutical interventions, the risk of disease contraction, and routes of infection spread.

Hand hygiene

Liquid, foam, or gel hand sanitizer contains antimicrobial agents critical in reducing skin contamination with potentially pathogenic microorganisms. Supported by the WHO, hand sanitizers have become a global standard for hand hygiene. Alcohol-based hand sanitizers are the most commonly used, as they are effective against most bacteria, fungi, and viruses. Their efficacy depends on the type of alcohol, its concentration, contact time, and whether the rubbed hands are wet. Alcohols like ethanol, isopropanol, n-propanol, or their combinations in concentrations between 60–80% reduce transient microbes on the skin due to non-specific protein denaturation but do not have persistent activity, leading to microbial regrowth after use. Alcohol-based hand sanitizers supplemented with additional antimicrobial agents increase microorganism inactivation. Non-alcohol hand sanitizers show poor antimicrobial coverage [20].

Contrary to the widespread belief about the harmfulness of alcohol used on hands, many studies have confirmed that detergent-based soaps and antiseptics dry the skin much more and are significantly less effective in skin decontamination. Tan and Oh claim that even the increased prevalence of irritant contact dermatitis or allergic contact dermatitis should not exempt anyone from hand hygiene procedures, which include hand washing with soap for at least 20 s or, in the absence of soap and water, using an alcohol-based hand rub [21]. Hirose et al. evaluated the importance of hand hygiene, finding that SARS-CoV-2 can survive on the skin surface for over 9 h, with complete inactivation after just 15 s of ethanol treatment [22].

Women are more prone to adhere to preventive procedures than men, perhaps because gender norms in society expect men to be tough, not weak, and to engage in more risky behaviors [8, 12]. Interviewing young adults, Barcenilla-Guitard and Espart showed that concern for their own and others' safety was the main declared reason for performing hand hygiene. The best practitioners were women between 22–25 years old who had studied health sciences. The authors postulate maintaining hand hygiene training at higher levels of education, considering its adaptation to particular fields of education, age ranges, and gender groups [23]. Ayran et al. determined a significant correlation between Turkish students' hand hygiene practices and gender, grade level, and previous training in hand washing and mask-wearing [24]. Analyzing 2,509 adults from the US, Italy, Spain, the Kingdom of Saudi Arabia, and India, Anderson-Carpenter and Tacy showed that older age, identifying as a woman, and higher education level were positively associated with hand washing. They suggest that the gender effect may be connected with the traditional family caregiver role among women and propose that female participants, experiencing higher levels of anxiety during the pandemic, may engage in mitigation strategies as a coping mechanism for COVID-related psychological distress [25].

Facemask usage

Coronavirus disease 2019 is spread mostly through respiratory aerosol and droplets released by an infected person while coughing, sneezing, singing, shouting or talking. Aerosol consists of liquid particles dispersed in the air, containing microorganisms like viruses. Respiratory droplets measuring 5–10 μm are the primary route of COVID-19 transmission. Bio-aerosols, containing droplets smaller than 5 μm, can travel many meters, causing airborne transmission. Saliva droplets, generated while coughing or sneezing, usually stay within a 1-meter distance from the source. This route is interrupted by maintaining physical distance, which is too far for viral particles to travel, and/or by covering the nose and mouth with a facemask [1, 2, 5, 11, 12].

In 2021, Tabatabaeizadeh analyzed the literature on the association between face mask use and COVID-19 infection, proving that mask-wearing decreases the risk of contracting COVID-19. This leads to the general conclusion that using a facemask is connected with the reduction of COVID-19 [1]. Coronavirus disease 2019 infection is often asymptomatic, yet an infected person is still a reservoir of the virus, which supports universal masking [18].

Surgical and N95 respirator masks are designed to protect the wearer from airborne particles and droplets, while cloth masks are intended to protect people within close proximity to the user [8]. Over 90% of our respondents theoretically gave the correct answer to question 3 about proper facemask usage, but, as mentioned before, most of them needed a reminder on how to actually wear a mask in practice.

The recommendation for mask-wearing created controversy in society, with some finding facemasks uncomfortable, cumbersome, a nuisance, or inconvenient, and hypothesizing that prolonged use of masks can be dangerous for health [8]. Opposite dilemmas appeared within the WHO, suggesting that wearing a facemask can give people a false sense of security, leading to neglect of other pandemic measures like hand washing and distancing [18]. In their study, Kılıç et al. found very few respondents to be openly opposed to facemask-wearing [26].

Some social and psychological aspects of mask-wearing can influence non-compliance with pandemic regulations, including diminished feelings of autonomy and free choice, and the need for relatedness, meaning feeling socially connected to others and acting like one's own group, from the close neighborhood to political parties, to fit in. Such mechanisms of social adaptation can work in different ways if one believes their group is a relevant source of information on what to do in particular situations, and they copy the group's behavior as the most adequate [8].

Kılıç et al. indicate psychological reasons for avoiding proper mask-wearing, including undiagnosed claustrophobia, causing patients' breathing discomfort complaints despite maintained oxygenation, which is a typical symptom of fear [26]. In fact, mask-wearing does not interfere with oxygen and carbon dioxide exchange [12]. Rebmann et al. found that wearing a medical-grade mask does not impact blood oxygen and carbon dioxide concentration during moderate physical activity [27]. Roberge et al. showed that wearing an N95 respirator mask does not affect respiration during low-intensity physical activity and a 3% rise in inhalation and exhalation resistance due to moisture retained in the mask is not likely to be perceived by its user [28]. Still, high-intensity physical effort while wearing a mask can affect pulmonary function and ventilation. Short-term use of a facemask in pregnant women does not create any physiological aberrations [8].

Headaches are more probable in cases of wearing an N95 mask for more than 4 h, which among medical professionals is often accompanied by other circumstances like physical and emotional stress, poor hydration, irregular eating and sleep deprivation, all contributing to headache onset. Other consequences of facemask-wearing are acne, nasal bridge scarring, facial itching, rash, skin irritation, and facial thermal discomfort [8].

Józefacka et al. suggest people's perception of risk can depend on the location, since they found differences in facemask-wearing willingness among respondents depending on the place, i.e., shopping galleries, cultural institutions, work and transport. They indicate that not only the personally assessed risk of infection is important, but also variables like age, the need for social approval, psychological profile (i.e., empathy, self-confidence, mental closure), and consistency with having been vaccinated [12]. Ayran et al. found a significant relationship between students' facemask-wearing and the female gender [24].

Si et al. noticed that after vaccination their participants, due to decreased risk awareness, were willing to reduce handwashing and physical distancing. This did not happen with facemask-wearing, which is internalized in Chinese social patterns, according to the authors' opinion, because of cultural customs, air pollution, or previous health education impact [2].

Social distancing

The COVID-19 pandemic resulted in new challenges for most societies, as social distancing rules were introduced in many countries. Such measures should be implemented when transmission rates increase to prevent overburdening the healthcare system [11]. Standard physical distance policies can be effective in reducing infection prevalence, but a distance of 2 m may be even more beneficial [2].

Analyzing the individual level of viral transmission and virtual distancing measures of participants using self-reports, Fazio et al. support the claim that proper social distancing is preventive against contracting COVID-19 [29].

Pandi-Perumal et al. emphasize the inevitable contradiction between the need to maintain physical distance to reduce the spread of infection and the need to nurture social connections to reduce the adverse mental health consequences of the pandemic. They quote negative sequels secondary to social isolation, such as: anger, anxiety, depression, fear, insomnia, perceived job insecurity, financial stress, loneliness, domestic violence, posttraumatic stress symptom, or suicidal urges [11]. Czeisler et al. found that their US and Australian respondents considered that COVID-19 limitations caused significant disruption of social life, work or studies, productivity, physical activity, sexual activity, and sleep patterns, transferring interactions to the virtual zone [30].

Postulating that the cure cannot be worse than the disease, Ubom et al. referred to the inability to keep prolonged lockdowns in countries like Nigeria due to a very high percentage of unemployment and low personal income per capita among average citizens. They describe the implementation of COVID-19 restrictions as leading to a deep social crisis due to wage and employment reductions, increases in food prices, and rises in criminal activities [3].

El-Far Cardo et al. report on protests by groups as large as 38,000 participants in Berlin against COVID-19 measures [13]. The reasons for people not maintaining social distancing include insufficient encouragement for the regulations, public leaders failing to model this behavior effectively, but also "human nature," which is inherently social, and the need for social support in times of anxiety and fear like a global pandemic [11].

MacIntyre et al. showed the effectiveness of adequate education, as almost all participants in their study in the US, Australia, and the United Kingdom (UK) were aware that despite wearing a mask, they also needed to wash their hands and practice social distancing [18].

Fazio et al. proved how subjective and unreliable self-reporting is, recommending virtual measures as much more accurate tools [29]. Abd-Alrazaq et al. analyzed the use of artificial intelligence for pandemic control and healthcare support, such as tracking the incidence of infections in real-time, increasing social distancing mobile apps, and the field of "infodemiology," which focuses on scanning the Internet for user-contributed

health-related content to improve public health by raising awareness about water, sanitation, and hygiene [31, 32].

Pandi-Perumal et al. differentiated between the US CDC definition of social distancing, which is staying at least 6 feet (about 1.8 m) from other people who are not from your household in both indoor and outdoor spaces, and the WHO preference for the term "physical distancing", which allows for staying socially connected while physically distant through video, calls, or texts. The authors recommend their own concept of "distant socializing" for maintaining physical distance while keeping social connections [11].

Quarantine

The term "quarantine" comes from the Latin word meaning "forty days," which was the typical period of isolation for those suspected of carrying a contagious disease [33]. It was first used commonly in 1127 to curb leprosy in Italy. Typically, it describes the control of people's movement during an epidemic [6]. Today, quarantine involves avoiding contact with others and staying home for the time appointed by authorities for those who are infected [11]. The term "quarantine" differs from "isolation" and "social distancing" [6, 34].

Our respondents had a good understanding of the essence and application of quarantine, as evidenced by the highest number of correct answers to question 8 in the questionnaire.

Quarantine has been a viable epidemic solution in countries such as: India, Canada, Singapore, Taiwan, the US, and China [6]. Guillon and Kergall showed that quarantine adherence is associated with the perceived threat of COVID-19, perceived benefits of quarantine, trust in the government, and individual modifying factors [35]. The authors recapitulate the findings of Webster et al. that quarantine compliance is also correlated with knowledge about the disease and social standards related to this measure [36]. In their survey research, Song et al. found that the justification of quarantine as necessary correlated significantly with the female gender and the age group of 36–55 years [6]. Iranian survey respondents had a positive attitude toward quarantine during an epidemic. Organizational aspects, compliance, and authorities' responsibility were mostly clear, while questions on particular quarantine regulations and ethics were somewhat controversial, likely because they concerned individuals' personal matters [34].

Quarantine can affect people by causing them to lose contact with loved ones, sacrifice freedom, breed fear, and experience boredom. A prolonged quarantine period can be associated with frustration, deteriorating mental health, fear, anxiety, stigma, stress, uncertainty, and depression [6]. Younger age, female gender, and staying in quarantine or spending most of the time at home are risk factors for anxiety and depression [30].

Vaccination

On December 31, 2020, a year after the first reported cases, the WHO announced the authorization of the first emergency use COVID-19 vaccine by Pfizer BioNTech. The aim was to achieve herd immunity by promoting individual immunity. At the same time, the WHO chief scientist urged vaccinated people not to abandon health protection measures, such as facemask-wearing, handwashing, and maintaining physical distance, due to vaccine hesitancy in the population, the potential for virus mutations, and the uncertain duration of post-vaccine protection [2, 10].

Sufficient vaccination against COVID-19, resulting in herd immunity, would allow for the lifting of pandemic restrictions, thereby reducing their social, psychological, and economic costs [2, 16]. The proportion of the vaccinated population necessary to achieve herd immunity can vary depending on types of vaccines, prioritized groups, population response, and viral mutations [7]. Vaccination and facemask wearing have proven effective and less expensive than other measures associated with higher economic and social costs [12].

Most of our participants gave correct answers to questions 6 and 7 about vaccination against COVID-19. Graeber et al. found a correlation between a pro-vaccination attitude and individual health status and subjective risk assessment related to possible COVID-19 disease [16]. Anti-vaccination dispositions and a positive attitude toward complementary and alternative medicine (CAM) were both connected with low trust in medical authorities and a belief in the harmfulness of vaccines, in contrast to "natural" healthcare methods [10].

When asked about possible vaccination policy in Germany in 2021, Graeber et al. found that 70% of adults declared voluntary vaccination against COVID-19, but only 50% supported mandatory vaccination. Paradoxically, about 27% of those who would not vaccinate voluntarily supported mandatory vaccination of the population. Twenty-two percent were against both voluntary and mandatory vaccinations, and 8% were not willing to get vaccinated at all but considered mandatory vaccination to be optimal. Those who found obligatory vaccination unnecessary believed that most of the population would get vaccinated voluntarily, generating sufficient herd immunity, and thought that the COVID-19 threat was overestimated [16].

Conspiracy beliefs are involved in most forms of science denial and seem to be a strong predictor of vaccine rejection, connected with low trust in science and authorities as well as a willingness to use alternative medicine [10]. Analyzing Chinese respondents, Si et al. found that the strongest factors motivating vaccination were: male gender, age, informal social norms like peer influence, education level, occupational risk, individual risk perception, social responsibility, and formal social norms such as government supervision [2].

In the research by Graeber et al., female participants, younger individuals, those with less education, and those with lower incomes were more skeptical about vaccination [16], while Latkin et al. found females declaring a stronger intention to be vaccinated than males [37]. Ubom et al. highlight the challenges of vaccination in developing countries, which, having spent significant funds on vaccines, must forgo treatment of other conditions, causing an increase in mortality and morbidity from diseases other than COVID-19. The authors suggest that such countries should emphasize citizen education on non-pharmacologic preventive measures, such as social distancing, facemask use, and hand washing [3].

Si et al. claim that future vaccination campaigns should consider gender differences to increase their effectiveness [2]. Factors discouraging vaccination, such as the time required for the vaccination procedure, bureaucratic administration, or co-payment, should be considered and possibly reduced [16].

Compliance

Non-pharmaceutical interventions and immunization program success depend on the public's acceptance and compliance [10]. Józefacka et al. assessed that motivation based on the "general good" is not enough in Poland and emphasized the need for adequate management of information through effective communication [12]. There are many factors influencing people's compliance with pandemic measures. The COVID-19 pandemic became a rapidly evolving event characterized by scientific uncertainty, accompanied by fast knowledge gain and a massive flow of information, swiftly changing content, mixed messages, and inconsistent recommendations, resulting in difficulties in communication and trust [4, 10]. The COVID-19 pandemic has shaken people's sense of competence, which is the feeling of being effective, capable, and in control of circumstances [8].

Scopelliti et al. stated that fear and trust in authorities are 2 key emotions determining the public's reactions to received information [5]. According to Slovic's findings, there is a significant difference between the judgment of a hazard among experts, who rely on hard data, and laypeople, who consider dread risk and unknown risk [38]. Another problem can be mental closure, an attitude that seeks unambiguity of data and opinions and requires simplified decision-making due to low tolerance for cognitive uncertainty. Mentally closed individuals are at risk of uncritically following a leader who tells them what to do [12].

Soveri et al. found trust in politics and science to be the leading determinant for compliance with pandemic restrictions [10], while El-Far Cardo et al. stated that the strongest predictor for adherence to pandemic protective behavior was people's risk perception [13]. Fazio et al. found that better social distancing, proven through virtual behavior measures, was connected to greater trust in scientists, more accurate knowledge, lower conspiratorial thinking, and higher COVID-19 risk perception [29]. El-Far Cardo et al. found COVID-19 risk perception to depend on the respondent's age, while Dryhurst indicated female gender as a strong determinant [13].

As the participants of our study were recruited among Obstetrics and Gynaecology Department patients, the group contained female respondents, mostly of reproductive age, so we cannot compare our results directly with those quoted above.

The need for social acceptance leads to socially promoted behavior. Adherence to social measures in danger comes via concern for other people, a sense of identity, and a tendency to cooperate [12]. There were correlations between political orientation and moral foundations in relation to COVID-19 social distancing and vaccine hesitancy in the US and Canada [39]. The dependence between political views and the consideration of COVID-19 as a health threat, as well as the intention to vaccinate, was also described by El-Far Cardo et al. [13].

Due to deep political and ideological divisions in Poland today, we decided not to ask our participants about these issues.

Deep distrust in politics and scientific institutions, as well as conspiracy thinking, are related to objections to health protection rules. Conspiracy beliefs are a conviction that secretive groups of people with malicious intentions operate behind particular events [10, 13]. Apart from low levels of public confidence, other factors decreasing willingness to follow recommendations were "pandemic fatigue" and the increasing popularity of denial attitudes [12].

A study from 25 European countries showed that those with poor institutional trust had higher mortality rates, meaning that in such circumstances experts and authorities have a special, global responsibility to be trustworthy in society [40]. In Polish society, concern about the COVID-19 pandemic decreased at the end of 2020 despite increasing morbidity and mortality. The authors interpreted this as an "immunity phase" due to the situation remaining unchanged despite efforts to resolve the crisis, but also as unrealistic optimism and confidence that "the disaster cannot happen to us" [12]. Among their respondents, Czeisler et al. found that as high as 91.4% believed they would never be infected [30].

Media

As mentioned earlier, over 50% of our respondents learned about COVID-19 mostly from the Internet. Almost 28% obtained information mainly from TV, about 2% from friends, and 17% declared using other sources. Since the public's response to a threat is determined by their understanding and appraisal of risk and by understanding risk mitigation measures, the model of media consumption and information-seeking can remarkably influence people's behavior towards the pandemic [13].

Research shows that among media consumers, those using TV had fewer doubts and dilemmas about COVID-19 management compared to users of social media. It is possible that unilateral, authorized information transfer is more unambiguous than that in social media, which allows for discussion among participants with different levels of competence but high emotional involvement. Scopelliti et al. found that exposure to social media in the context of COVID-19 was correlated with a higher risk of depression, fear, anxiety, and general psychological distress. They also show that many novel, inconsistent, or ambiguous news items given to the public can lead to so-called overload, meaning an inability to process or comply with obtained information [5]. Soveri et al. found that in Finnish society only about half of respondents trusted the media and authorities for accurate information on COVID-19, while 65% trusted doctors and 71% relied on scientists. They believe the level of trust is an important factor in people's adherence to official anti-pandemic guidelines, putting an obligation on authorities to diligently build trust in the public through transparent communication [10].

Czeisler et al. calculated that over 40% of their US and Australian respondents were spending an average of 23.2 h a week consuming information about COVID-19 [30]. Quoting Holmes et al., Scopelliti emphasized the influence of the media

on people's mental health and social attitudes, and called for intensive research on the optimization of media consumption and health messaging methods to make them reliable and useful for the community [5, 41]. Exposure to media like TV, promotion of positive attitudes toward social prevention, indications for individual prevention, calming information, and moderate levels of fear correlated positively with preventive behaviors among the audience [5]. Pandi-Perumal et al. stated that clear and effective communication by the media, including cutting misinformation, is helpful in reducing fear and anxiety [11]. On the other hand, unclear information on the pandemic given by the media caused uncertainty and ambiguity in society facing the risk of virus contraction [12]. Mistrust of official sources of information, like scientific institutions, can result in the spread of different forms of misinformation, including denial, downplaying, conspiracy theories, or claims of therapy ineffectiveness, which should be perceived as a serious public health threat [13].

Jahanbakhsh et al. noticed a 40% increase in social media use after the COVID-19 outbreak. The most common purpose declared by consumers was learning about COVID-19 prevention and treatment. Paradoxically, the greatest psychological impact of such actions turned out to be anxiety induction. The authors think that the significant rise in anxiety among social media consumers was induced by misinformation. They advise the authorities to establish formal webpages to manage and stop the spread of false information [9]. The distribution of information via social media is accompanied by misinformation; for example, the beginning of vaccination in Germany was followed by a wave of disinformation [13]. Relying on social media for COVID-19 information carries the risk of believing misinformation, which is a determinant of reducing health--protective behavior and willingness to vaccinate [14]. Health--related messages combined with political content are at higher risk of including misinformation [8]. El-Far Cardo et al. found that most participants in their study reported public media as their main source of COVID-19 information, followed by those who declared websites from health authorities. The latter group reported higher risk perception, in contrast to consumers of social media channels like Telegram or Facebook, who were also more skeptical about vaccination [13]. Ruiz and Bell confirm that vaccination intention in the US was correlated with not relying on social media for virus news [42].

Bora et al. evaluated 78 YouTube handwashing videos that collected over 37 million views. The authors found only 58.9% of them understandable, useful, and containing good-quality information. This category of videos was mostly uploaded by health agencies or academic institutes. Unfortunately, the non-understandable, untrustworthy, and poor-quality videos had more viewers [43].

CONCLUSIONS

We assessed the knowledge of COVID-19 among the participants of our research as good and comparable with that presented in other studies. The difference between TV and Internet consumers was not significant. Knowing the influence of various factors, such as: age, gender, political views, and economic status on people's attitudes towards COVID-19, we believe the organizers of health information campaigns, including experts, authorities, and media operators, should take these factors into account to improve their effectiveness and reduce undesired effects like misinformation, mistrust, and anxiety affecting the recipients.

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THE QUESTIONNAIRE

Correct answers, consistent with the state of knowledge at the time, are marked in bold.

This is a completely anonymous COVID-19 survey with 10 questions. Please select the best answer for each question. Please mark only 1 answer per question.

1. To reduce the risk of contracting COVID-19, you should use:
   a. mask, social distancing, and gloves
   b. mask, social distancing, and hand sanitation
   c. social distancing and frequent hand washing
   d. mask and gloves

2. The highest risk of contracting COVID-19 is:
   a. on a walk lasting more than 1 h
   b. on shopping in a hypermarket lasting more than 1 h
   c. during a party when guests sit together at the table for 3 h
   d. in the waiting room at the clinic

3. The mask:
   a. should cover the nose
   b. should cover the nose and mouth
   c. should cover the nose and mouth but not necessary in the pregnant
   d. should cover the mouth

4. The COVID-19 virus is most easily transmitted:
   a. sexually
   b. by dirty hands
   c. with respiratory aerosol, i.e. exhaled air
   d. through undercooked food

5. The least risk of infection occurs:
   a. during a 2-hour movie at the cinema
   b. in the church during the service
   c. during outdoor sports (e.g. in a park)
   d. while dancing at a party in a club

6. The vaccine against COVID-19:
   a. prevents infection and disease
   b. reduces the risk of getting sick, and in case of illness, it reduces the risk of a severe course of the disease
   c. reduces only the risk of a severe course of the disease
   d. the truth is nobody knows

7. Those who have already had COVID-19:
   a. should be vaccinated against COVID-19

b. can get vaccinated against COVID-19 but it won't change anything
c. should not be vaccinated against COVID-19
d. whether they should be vaccinated depends on how severely they were ill

8. The quarantine is:
a. temporary stay in complete isolation without leaving the place of stay (e.g. the flat)
b. limiting leaving the place of stay only for important matters (e.g. food shopping, urgent official matters)
c. remote work, if the employer has agreed to it
d. temporary isolation, but the isolated person can be visited by the closest family

9. Suffering from COVID-19 one must seek medical attention immediately when the following symptom occurs:
a. headache
b. fever
c. dyspnoea
d. rash

10. Where do you most likely get information about COVID-19?
a. television
b. Internet
c. friends
d. other sources