Review

COVID-19 and misinformation: Evaluating public awareness and the role of Aesthetic Medicine

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Abstract. *Purpose:* The COVID-19 pandemic underscored global vulnerabilities in handling such a widespread health crisis, significantly affecting the healthcare system. A relevant amount of misinformation from the general population was observed, which caused a loss of trust in the healthcare system. Misinformation could be reduced by medical consultation and aesthetic physicians could take part in this, playing an important role. *Methods:* This study assesses the general population's ability to differentiate between accurate and misleading COVID-19 information, which is a critical factor in managing public health responses and mitigating the spread of misinformation. A cross-sectional survey was conducted with 230 participants. *Results:* Results indicated a high level of understanding, with an average correct response rate of approximately 76%. No significant gender differences were found in survey scores. Interestingly, the younger age group (18-22 years) outperformed the 23-39 age group, despite the latter's higher education levels. Notably, 60% of respondents incorrectly believed that COVID-19-positive mothers should be separated from their children, contradicting health guidelines promoting mother-infant proximity for emotional and developmental benefits. Additionally, 40.5% misunderstood vaccination recommendations for immunodeficient individuals, and only 13% correctly understood proper hand sanitizer use, highlighting gaps in public health education. *Conclusions:* This study highlights some discrepancies regarding relevant information in the general population, emphasizing the essential role of medical counseling in combating misinformation. Aesthetic physicians should integrate comprehensive health education into patient interactions. The holistic approach, led by the aesthetic physician, could address misconceptions, and promote accurate health practices, such as proper hygiene, vaccination and health advice, thereby enhancing public health resilience against current and future pandemics. In an era where misinformation is rampant, effective counseling can significantly mitigate its impact, fostering a well-informed public capable of making sound health decisions.

Key words: counseling, Covid 19, health literacy, preventive medicine

Introduction

The onset of the "coronavirus" (COVID-19) pandemic in December 2019 has highlighted the world's vulnerability in dealing with an event of such magnitude[1]. It quickly spread through Italy, the first European region where the virus began circulating, and required the implementation of a lockdown on March 9, 2020[2].

The COVID-19 pandemic had a significant impact on both the people who contracted the disease and the whole healthcare system. It disrupted the training of healthcare professionals, leading to interruptions and a shift to virtual learning, which may have affected the level of preparation[3,4] of new healthcare workers. In addition, the pandemic caused changes in health management systems[2,5-7], such as the reallocation of resources and the rapid adoption of telehealth,

emphasizing the need for a more resilient and adaptable healthcare infrastructure[8].

Amidst uncertainty and change, conspiracy theories and alternative facts thrived on the Internet[9]. They exploited people's frustration and helplessness, as they struggled to comprehend the disaster and assign blame. This environment amplified misinformation, making it more difficult to address the broader impacts of the pandemic. Fake news is 'false stories that look like news, spread on the Internet or through other media, usually created to influence political opinions or as a joke'[10] and can have a significant impact on society as it is easier to generate manipulated and false content, which makes it harder to detect the truth[11]. The proliferation of fake news has public health consequences because it fuels panic and discredits the scientific community[12].

Regarding the covid-19 pandemic, it is important to mention that not all persons had the same risk of developing the disease and the same mortality or risk of suffering a major disease. This clinical data is very relevant because different people reacted with a state of anxiety or stress very much related to their own risk, moreover people with a low risk were more likely to underestimate the disease[12]. Counselling for patients plays an important role to share lifestyles, and in the case of fragile patients, each different medical specialist in charge of a patient, should have started specific counselling related to the risk of developing a serious disease. In fact, for fragile patients or patients with comorbidities, the role of vaccination, handwashing and the use of masks had a unique and central role[11,12].

The aesthetic medical physician, as well as all other specialists, plays an important role in supporting their patients in lifestyle changes, for which they could direct them to pursue counselling activity.

We are currently in the post-pandemic phase, meaning that there is a reduced circulation of the virus; nevertheless, there is still a high level of awareness regarding prevention in the community, especially for the elderly[5]. From a medical research perspective, our system is analyzing the key changes and issues resulting from COVID-19[8]. Additionally, we are considering the lessons that the system should have learned at this stage[5]. This is the reason why we have to analyse all points of view and possible lessons or procedures that could prepare us for any future pandemics. Our article focuses on evaluating the possible role of aesthetic medicine in spreading correct health procedures and counseling support to patients in the general population.

The study aim is to assess the general population's ability to differentiate fake and real news on COVID-19. We will discuss the possible implications of trust in misinformation, exploring how this trust may influence public perception and behavior during a health crisis.

Materials and Methods

This cross-sectional study was approved by the SIMED research council and followed the principles outlined in the Declaration of Helsinki.

A team of researchers selected 15 pieces of public health information relevant to COVID-19 from the official website of the Italian Ministry of Health. This information was then used to create a questionnaire of 15 true or false questions. The survey was developed using Google Forms, which allowed responses to each of the 15 questions and demographic information, including age group, education level, and gender. A sample of 230 individuals was randomly selected from social network profiles, and each participant was sent a link to complete the questionnaire. The survey remained open for one month to give participants sufficient time to respond. After this period, data collection was closed. To protect participants' privacy, all data was anonymized.

A statistical analysis was conducted using the R programming language[13]. Categorical values were summarized as frequencies and percentages, while continuous variables were presented as mean and standard deviation. Categorical variables were compared using the chi-squared test. T-test or ANOVA was used to compare continuous variables between groups.

This study adhered to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement to ensure a full and transparent reporting of the results obtained[14].

Results

Out of the 230 individuals interviewed, 185 (80.4%) responded. The gender distribution included

65.9% females and 34.1% males. Age-wise, 65.9% were between 23-39 years, 16.2% were 40-59 years, 13.5% were 18-22 years, and 4.3% were 60-74 years. In terms of education, 34.6% held a high school diploma, 30.3% had a bachelor's degree, and 26.5% had a master's degree. The mean score on the survey was 11.4 out of 15, with a standard deviation of 1.8. Table 1 shows the frequencies of correct answers.

The independent samples t-test was conducted to compare scores between female and male respondents. The results indicated that there was no statistically significant difference between the mean scores of females and males ($t(106) = 0.875$, $p = 0.383$).

The one-way ANOVA test conducted on the scores yielded a statistically significant result ($F(3, 181) = 4.15$, $p = 0.007$), indicating that there are significant differences in scores between the different age groups. To further investigate these differences, a Tukey post-hoc test was conducted. The post hoc analysis indicates significant differences in mean scores between the 18-22 and 23-39 age groups ($p = 0.017$), with the latter scoring lower than the former.

Table 2 shows the level of education by age group.

Table 1. Frequencies of correct answers

Statement	Correct Answers N (%)
Vaccines used for the fourth dose do not work with new variants (False)	148 (80.0)
COVID-19 vaccines are unable to interact with or modify DNA in any way (True)	167 (90.3)
Expired vaccines are inoculated (False)	185 (100.0)
SARS-CoV-2 is a strain of influenza virus that has mutated (False)	139 (75.1)
Masks do not protect against new virus variants (False)	181 (97.8)
Antibiotics do not affect viruses and therefore no effect on the new coronavirus either (True)	147 (79.5)
COVID-19-positive mothers and children should not be separated but should be enabled to stay together (True)	74 (40.0)
SARS-CoV-2 infection in children can be associated with serious consequences (True)	142 (76.8)
Anti-SARS-CoV-2 vaccination is not recommended for people with immunodeficiency (False)	110 (59.5)
It is possible to schedule the administration of influenza and anti-SARS-Cov-2 vaccines in the same vaccination session (True)	159 (85.9)
When washing hands, if soap is used, it is important to rub the hands for at least 40 to 60 seconds (True)	179 (96.8)
The hydroalcoholic solution only needs to be rubbed in for 5-10 seconds (False)	24 (13.0)
Coronaviruses are viruses that circulate among animals and some of them also infect humans (True)	137 (74.1)
SARS-CoV2 is mainly transmitted via droplets and aerosols (True)	153 (82.7)
An infected person cannot transmit the virus before symptoms occur (False)	165 (89.2)

Discussion

This study aims to assess the general population's ability to discriminate between fake and real news on COVID-19.

A significant proportion of the respondents had at least a high school diploma, while a considerable proportion had pursued higher education, including bachelor's and master's degrees. This suggests that the respondent population is relatively educated, which may influence their understanding of complex topics such as COVID-19.

Analyzing the results, we notice that most of the statements have a high percentage of correct answers, indicating a generally good understanding of COVID-19-related information. The mean score of 11.4 out of 15 in the survey indicates a generally high level of knowledge among respondents, with an average percentage of correct answers of about 76%. Both female and male participants demonstrated a similar level of understanding or performance in the survey, as evidenced by their comparable mean scores.

Despite the higher level of education, the 23-39 age group scored significantly lower than the 18-22 age group ($p = 0.017$), as indicated by post hoc analysis. This specific category would benefit from a training program taught by aesthetic physicians. Furthermore,

Table 2. The Chi-Square test yielded a significant result ($\chi^2 = 39.1$, df = 18, p = 0.003), indicating a significant relationship between the respondents' educational level and age

	5th grade	8th grade	Advanced Professional Degree	Bachelor Degree	High School Diploma	Master Degree	PhD
18-22	0	0	0	12	13	0	0
23-39	0	1	8	37	32	43	1
40-59	1	0	2	5	17	4	1
60-74	0	0	2	2	2	2	0

gender does not seem to influence the population which is why physicians could provide advice to patients of all genders (t (106) = 0.875, p = 0.383).

The analysis of the population with less knowledge could be useful to promote targeted counseling processes.

The noteworthy aspect of this finding is that despite the recommended practice, which advocates keeping COVID-19-positive mothers and children together, a significant percentage (60%) of respondents believe it is correct to separate them. This discrepancy between public perception and recommended guidelines underscores the need for clearer communication and education regarding appropriate protocols for managing COVID-19 cases within families. Separation can impact the mother-infant relationship and the well-being and development of both parties. Maintaining close contact between mothers and infants is crucial for emotional bonding, breastfeeding, and the provision of comfort and reassurance, which are essential for the infant's development and the mother's mental health[15]. This discrepancy therefore highlights the urgent need for comprehensive education on the potential detrimental effects of separation on both the mother-infant relationship and their overall well-being.

40.5% of respondents did not recognize the statement that an anti-SARS-CoV-2 vaccination is recommended for people with immunodeficiency. This indicates a significant misunderstanding among a substantial proportion of respondents regarding COVID-19 vaccination recommendations for individuals with immunodeficiency.

Individuals with immunodeficiency are conversely at higher risk of experiencing severe illness if they contract COVID-19. Vaccination plays a crucial role in protecting this vulnerable population from the virus and reducing the likelihood of serious complications or adverse outcomes. Failure to recognizing the importance of vaccination for individuals with immunodeficiency may leave this vulnerable population unprotected against COVID-19[16,17]. Vaccination continues to be a topical issue, and public awareness of this clinical practice remains an essential tool to achieve good coverage and reduce the spread of infection; therefore, during patient counseling by Aesthetic Physicians, the sharing of proper vaccination practices could also be included. The well-being of the patient, which is the main aspiration in the medical field, would be aided through the communication of this information by insuring their health.

The finding that only 13% of respondents know how to use hydroalcoholic solutions is worrisome considering their widespread use. Merely rubbing a hydroalcoholic solution for 5-10 seconds does not provide sufficient time for the solution to eliminate pathogens from the hands[18,19].

A relevant issue is hand washing procedures, which are still the most important prevention maneuver for community infectious diseases. Specifically, once co-moribidity patients who are followed by the aesthetic physician have been identified, they should carry out specific training[20]. This is an important issue which should not be overlooked, seeing as going through with the training programs mentioned in this study could have an important positive impact on the community[21].

Misconceptions about the proper use of hand sanitizers could have serious public health implications, as inadequate hand hygiene can contribute to

the spread of multiple infectious diseases. At the end of the procedures conducted by the aesthetic physician, there is always a consultation phase on proper hygiene procedures, and even at this stage, counseling can be supplemented by sharing general personal hygiene information with the patient aimed at reducing the spread of pathogens.

This study provides valuable insights into the public's ability to discern between accurate and misleading information about COVID-19. The educational level of the surveyed population appeared relatively high, likely influencing their comprehension of complex pandemic-related topics. Overall, respondents demonstrated a good understanding of the information related to COVID-19. Interestingly, despite the higher level of education, the 23-39 age group scored significantly lower than the younger 18-22 age group. However, no significant differences were observed between the 23-39 age group and other age groups. A concerning finding is the misconception among a substantial proportion of respondents regarding the recommended practice of keeping COVID-19 positive mothers and children together, with 60% believing that separating them would be the correct option. In addition, the misunderstanding regarding COVID-19 vaccination recommendations for individuals with immunodeficiency, observed in 40.5% of respondents, underscores the importance of ensuring that vulnerable populations are adequately protected through vaccination efforts. Moreover, the low percentage of respondents who understands the proper use of hydroalcoholic hand hygiene solutions raises concerns about potential public health implications.

Medical counseling plays a central role in reducing fake news about diseases. Today, the problem of misinformation has become more and more significant, and physicians, who have an ongoing relationship with patients, should also share elements of health culture relevant to their patients, such as handwashing or the importance of vaccinations[11,22].

Medical counseling is playing an increasingly important role, particularly when conducted by physicians like aesthetic practitioners who adopt a holistic approach to patient care. In recent years, it has become a crucial element in reducing the impact of infectious and stress-related diseases through effective counseling[23-26].

Proper hand hygiene is critical in preventing the transmission of infectious diseases, and misconceptions in this area could contribute to the spread of not only COVID-19 but also other transmissible disease.

Further studies such as this one are necessary in order to understand the general knowledge of the population and to define clear and necessary information that the aesthetic physician can share with patients during pre- and post- procedure counseling. The aim is to increase the patients' knowledge in order to reduce the risk generated by misinformation and ensure the spread of good prevention practices in terms of hygiene and vaccination coverage.

Conclusion

This study suggests the critical role of aesthetic medicine in combating misinformation about COVID-19. Despite a generally high level of knowledge among respondents, significant misconceptions persist. Higher education alone may not suffice to effectively counteract misinformation.

The study emphasizes the need for improved public health education and the clear communication of guidelines. Counseling from the aesthetic physician, who often engages holistically with patients, can play a pivotal role in addressing these knowledge gaps. By integrating accurate health information into routine interactions with the patient, healthcare providers can foster a better understanding and adherence to public health recommendations.

In conclusion, improving health literacy through targeted education and effective counseling is essential to mitigate the impact of misinformation. This approach will not only improve individual health outcomes but also strengthen public health resilience in the face of current and future health crises.

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