

INFODEMIC DURING THE SARS-COV-2 CORONAVIRUS PANDEMIC IN POLAND

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Summary. The outbreak of the SARS-CoV-2 coronavirus pandemic was accompanied by the spread of much false information, rumors, and conspiracy theories, referred to as the infodemic. The aim of this study was to determine what misinformation about COVID-19 Poles gave credence to during the third wave of the pandemic. The questionnaire comprised a demographic part and seven items concerning misinformation about the pandemic. The results show that the majority of respondents believed that data on coronavirus infections were deliberately manipulated (71.4%) and that some COVID-19 vaccines were unsafe (62.4%). Compared to women, men more strongly agreed with the false information that coronavirus did not exist and that it was not much different from the common flu. Subjects with secondary or lower education agreed more with all false statements about the pandemic more often than those with higher education. The findings of the study can be used to prevent the negative consequences of the infodemic.

Key words: infodemic, coronavirus, COVID-19, misinformation

Introduction

On 11 March 2020, due to the high incidence of disease caused by the SARS-CoV-2 coronavirus, the World Health Organization (WHO) declared an international pandemic (Ghebreyesus, 2020). COVID-19 has affected the functioning of millions of people around the world. The systematic increase in the number of infections and deaths made it necessary to introduce a sanitary regime and restrictive measures regarding interpersonal contacts. Public gatherings were forbidden. People were called on to keep social distance.

During the successive waves of COVID-19, the number of coronavirus-infected people rapidly grew. The first wave started in the spring of 2020, the second one in

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the fall of that year, and the third one in the spring of 2021. At the end of March and at the beginning of April, there was a great increase in the number of cases in Poland. For this reason, a lockdown was introduced from 20 March to 9 April 2021, with a list of new restrictions.

In addition to the widespread threat to physical (Huang et al., 2021; Xiong et al., 2021) and mental health (Bao et al., 2020; Xiang et al., 2020; Lee, Jobe, Mathis, 2021) and apart from socioeconomic changes, the pandemic caused chaos in the information space (Krawczyk, Mikulski, 2020). Plenty of untrue information, rumors, and conspiracy theories about COVID-19 appeared in the media. The World Health Organization has warned of the negative effects of the spread of false or misleading information, referring to this worrying trend as an infodemic (WHO, 2021). The concept of disinformation, understood as misleading information intended to deceive the recipient, is distinguished from “misinformation” and “malinformation” (Wardle, Derakhshan, 2017; Santos-D’Amorim, Fernandes de Oliveira Miranda, 2021). “Misinformation” is understood as false information that can be interpreted in many ways and is not intended to cause harm, while “malinformation” is defined as true confidential information intentionally used to obtain a specific benefit. It can cause harm to a person, institution, or state.

An analysis of the Polish-language information space on the Internet, carried out in mid-2020, indicated that the most discussed issues were the origin of coronavirus and the way it spread, and that the existence of a global pandemic was questioned (Krawczyk, Mikulski, 2020). The report revealed that information about the laboratory origins of the virus and about an elite conspiracy to reduce the world’s population appeared quite often. China has been blamed for the creation of the SARS-CoV-2 coronavirus as a tool to influence the Western world. Manipulated statements of scientists and politicians and misinterpreted statistics were used to create information chaos. It was noted that a significant number of users, especially Facebook users, posted anti-vaccine content and questioned the mouth and nose cover requirement. The introduction of precautionary measures was seen as a tool to enslave and degrade society (Krawczyk, Mikulski, 2020).

Research conducted at the end of 2020 showed that 34% of Poles were convinced that coronavirus was not of natural origin and that it was created in a Chinese laboratory. Moreover, almost 1 in 10 people believed that COVID-19 was caused by 5G waves (Wróblewski, Meler, Afeltowicz, 2020). It is also worth noting that the rumors spread contained a variety of information, suggesting, for example, that the sources of the coronavirus infection were domestic animals, cookies, rice, and the Chinese Red Bull energy drink. Eating garlic, in contrast, was supposed to help treat COVID-19, and drinking bleach could allegedly kill the virus. In addition, there have been opinions suggesting that alcohol consumption, cocaine use, and smoking marijuana prevent infection. Drinking water every 15 minutes, keeping the throat moist, avoiding spicy foods, and taking vitamins C and D (Demczuk, 2020) were expected to have beneficial effects. Research conducted in the UK,

Ireland, the USA, Spain, and Mexico showed that most respondents did not believe misinformation on COVID-19, but some misinformation was considered credible (Roozenbeek et al., 2020).

COVID-19 misinformation appeared less frequently in traditional media than it did on online platforms. The use of social media was associated with greater absorption of incorrect information about COVID-19 (Bridgman et al., 2020; Allington et al., 2021). The views of celebrities, amounting to conspiracy theories about coronavirus, were mainly reproduced on online platforms. Research results indicate that misinformation from politicians, celebrities, and other famous public figures accounted for 20% of all reported untrue statements about COVID-19. It enjoyed great interest, inspiring a large number of comments on English-language social media (Simon, Howard, Nielsen, 2020). The remaining 80% of misinformation came from other social media users, but it did not stir up much interest. The results of the above studies show that 39% of false or misleading information was related to the actions of public authorities, including governmental and international bodies such as the WHO or the United Nations. With the advent of successive waves of the pandemic, false information was modified, and new kinds of such information emerged.

Research conducted in Poland (Krawczyk, Mikulski, 2020) suggested that YouTube and Facebook had the strongest connection with conspiracy theories. In addition, websites that most often spread false information were identified. These were junk news websites. They attracted audiences with sensational articles promoting conspiracy theories. The sources of misinformation were also comments and posts published in private groups or on users' walls and video content, mainly from YouTube.

An analysis of 232 examples of misinformation carried out in Brazil showed a similar trend. Most of the misleading messages were posted on Facebook (76%) and WhatsApp (10%) (Biancovilli, Makszin, Jurberg, 2021). As regards the types of misinformation, the most frequent ones were fabricated content (53% of the total), false content (34%), or misleading content (13%). Most false information was published in text form (47%). It found that 92.9% of disinformation identified as "fabricated content" were "health tips." An analysis of 1,137 responses from WhatsApp users in India (Amol, Bapaye, 2021) shows that people over 65 were most susceptible to misinformation. Moreover, the respondents in the 19–25 age group showed significantly lower susceptibility to misinformation than people aged over 25. It was also found that false information with a link attached or with a source provided was considered six times more likely to be true than false information without an attached link or source. The presence of source evidence of erroneous information increased its credibility. Other research (Shahi, Dirkson, Majchrzak, 2021) on the spread of COVID-19 misinformation on Twitter suggests that false statements generate more attention and are replicated faster than partially false information.

Due to the spread of false information, many countries, international organizations, enterprises, and digital platforms (such as Facebook, Google, and Twitter)

have taken measures to limit the range of the infodemic. It should be pointed out, however, that the attempts made were usually trial solutions of an ad hoc nature. They did not constitute a stable and homogeneous system that could effectively limit the reach of harmful content (Wigienka, 2021).

The negative effect of the infodemic may be a decrease in trust in the health service, public institutions, and representatives of state authority, leading to harmful health behaviors. Research confirms (Pickles et al., 2021) that greater acceptance of false information about the pandemic is associated with a decline in trust in government reports on COVID-19 and in scientific institutions. The results of research conducted in Poland at the beginning of the pandemic indicated that 63.7% of respondents believed that the authorities did not provide the public with complete data on the scale of the disease (Maj, Skarżyńska, 2020).

It should be noted that an infodemic may aggravate or extend a pandemic, raising doubts in society as to how to effectively protect one's own health and that of one's family. Research has shown (Roozenbeek et al., 2020) that increased vulnerability to misinformation negatively impacts compliance with COVID-19-related orders and restrictions. It lowers the motivation to get vaccinated against the virus and reduces willingness to recommend the vaccine to one's friends and family.

The aim of the present study was to determine what misinformation about COVID-19 Poles believed during the third wave of the pandemic. Fundamental to the research undertaken was the assumption that there were relationships between the most widely disseminated false information in the media and selected socio-demographic variables, namely: gender, age, education, and employment status. I formulated three research hypotheses:

Hypothesis 1: Men report higher agreement with false opinions about the pandemic than women.

Hypothesis 2: Younger respondents (aged 18–30 years) agree with false opinions about the pandemic to a greater degree than respondents over 30 years of age.

Hypothesis 3: Respondents with secondary or lower education report a greater degree of agreement with false opinions about the pandemic compared to those with higher education.

The results of other studies conducted during the COVID-19 pandemic confirm the existence of relationships between the variables included in the hypotheses. They show that a greater degree of agreement with false opinions about the pandemic is found in men rather than in women (Allington et al., 2021; Cassese, Farhart, Miller, 2021), in younger rather than older individuals (Duplaga, 2020; Allington et al., 2021), and in respondents with secondary or lower education rather than in those with higher education (Pickles et al., 2021).

Most studies into false or misleading information about COVID-19 were conducted in the early stages of the pandemic (Bridgman et al., 2020; Krawczyk, Mikulski, 2020; Roozenbeek et al., 2020; Simon, Howard, Nielsen, 2020; Wróblewski, Meler, Afeltowicz, 2020). The results so far allow for a preliminary overview con-

cerning the spread of false information in society. It should be taken into account, however, that the prevalence of specific misinformation topics varies and may go beyond the levels identified in previous research.

The obtained data may help to understand the scale of the acceptance of false information about the pandemic in Polish society. On this basis, it will be possible to take adequate measures to counteract the negative effects of the infodemic on public health.

Methods

The study was conducted on a nationwide sample of 574 subjects (see Table 1). The sample consisted of 382 women (66.6%) and 192 men (33.4%). There were 337 participants aged 30 years or younger (58.7%), 160 participants aged 31–45 (27.9%), 68 participants aged 46–65 (11.8%), and 9 subjects aged over 65 (1.6%); 46.5% of the respondents had secondary or lower education, while 53.5% had higher education. The overwhelming majority of people with secondary or lower education were in the under-30 age group (45.1%), while the majority of respondents with higher education were in the 31–45 age group (68.1%). More than half of the respondents (57.0%) were working people, and the second largest group were students (34.3%). While 20.2% of the respondents were in quarantine and 11.5% were in isolation, the majority (68.3%) were neither quarantined nor isolated.

Table 1. Characteristics of the sample ($N = 574$)

	Demographic variables	<i>N</i>	%
Gender	woman	382	66.6
	man	192	33.4
Age	18–30 years	337	58.7
	31–45 years	160	27.9
	46–65 years	68	11.8
	over 65 years	9	1.6
Education	incomplete or none	5	0.9
	elementary	15	2.6
	lower secondary	9	1.6
	basic vocational	26	4.5
	upper secondary	212	36.9
	higher	307	53.5

cont. table 1

	Demographic variables	N	%
Employment status	school or university student	197	34.3
	unemployed	38	6.6
	old-age or disability pensioner	12	2.1
	working	327	57.0
Quarantine or isolation	I have not been in quarantine/isolation	392	68.3
	I have been in isolation	66	11.5
	I have been in quarantine	116	20.2

Note. N = numer of participants.

Due to the significant differences in size between some groups of respondents, for the purposes of the study I made the necessary modifications. Because few subjects were over 45 years of age, I analyzed respondents aged 31–45, 46–65, and over 65 as one group. As a result, two age groups were compared: respondents aged 18–30 vs. respondents aged over 30. Again, due to the highly significant disproportion between the groups in terms of size and the relatively small percentage of respondents with education other than secondary or higher, I decided to classify individuals without education and those with elementary, lower secondary, and upper secondary education into one group (secondary or lower education). Respondents from this group were compared to those with higher education.

The last of the analyzed variables was employment status, considered in terms of four categories. Due to the very small number of unemployed individuals (38 participants) and old age or disability pensioners (12 participants), I divided the sample into three groups: students (197 participants), workers (327 participants), and non-workers (50 participants).

The study was conducted during the third wave of the SARS-CoV-2 coronavirus pandemic, between 24 March and 8 April 2021. Because of the restrictions on social contact, participants were recruited using snowball sampling. The study was carried out via the Internet. The link to the questionnaire was disseminated through social media—mainly Facebook—and via email, with a request to complete an anonymous form and encourage others to complete the survey as well. Respondents were informed about the purpose and procedure of the study. They gave informed consent to take part in the research.

The original survey used in the study was constructed in the Google Forms® application. It consists of questions about demographic data such as gender, age, education, and employment status. It also included seven items concerning misinfor-

mation about the COVID-19 pandemic. They were formulated based on an analysis of the false information about COVID-19 most frequently found on social media. Respondents were asked to what extent they agreed with the opinions (1) that face masks did not protect against coronavirus, (2) that some COVID-19 vaccines were dangerous, (3) that wearing face masks led to the development of pulmonary mycosis, (4) that coronavirus did not exist, (5) that the SARS-CoV-2 coronavirus was not much different from the common flu, (6) that coronavirus was a means of reducing the population of the earth, and (7) that data on coronavirus infections were being deliberately manipulated. For each item, there were four response options: *strongly disagree*, *moderately disagree*, *moderately agree*, and *strongly agree*.

To verify the factor structure of the measure used to assess misinformation about COVID-19, I conducted a confirmatory factor analysis using IBM SPSS AMOS 28 (Arbuckle, 2005). I tested a one-factor model, whose indicators were seven items designed to measure misinformation. The model proved to be an acceptable fit to the data set ($\chi^2_{(13)} = 45.870$, $p < .001$, CFI = .978, AIC = 75.870, RMSEA = .066, SRMR = .0294). I also verified the internal consistency of the measure by computing Cronbach's alpha. The reliability coefficient was high ($\alpha = .86$).

The distribution of the variables differed significantly from normal distribution, which is why I applied non-parametric tests in the analyses. I used the Mann–Whitney U test and the Kruskal–Wallis H test to verify each hypothesis and to make comparisons between the groups of respondents.

The results presented in this report constitute one part of the research project. Analyses of the remaining parts, concerning the psychosocial effects of the pandemic, will be presented in subsequent reports.

Results

Percentage distribution of results

To determine which false information about the COVID-19 pandemic the respondents believed, I checked what percentage of participants agreed and disagreed, strongly or moderately, with the opinion expressed in each item. The analysis of the data presented in Table 2 shows that 71.4% of the respondents shared the opinion that data on coronavirus infections were deliberately manipulated and that some COVID-19 vaccines were dangerous (62.4%); 53.5% of respondents agreed that face masks were ineffective against coronavirus and that wearing them led to the development of pulmonary mycosis. Almost half of the respondents (47.7%) believed that coronavirus was a means of reducing the earth's population. Fewer subjects (36.1%) subscribed to the opinion that coronavirus was not much different from the common flu, and the fewest (14.7%) agreed that coronavirus did not exist.

Table 2. Misinformation about the COVID-19 pandemic

	Strongly disagree		Moderately disagree		Moderately agree		Strongly agree	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Face masks do not protect against coronavirus	100	17.4	167	29.1	152	26.5	155	27.0
Some COVID-19 vaccines are dangerous	73	12.7	143	24.9	199	34.7	159	27.7
Wearing face masks leads to the development of pulmonary mycosis	83	14.5	184	32.1	166	28.9	141	24.6
Coronavirus does not exist	318	55.4	172	30.0	59	10.3	25	4.4
The SARS-CoV-2 coronavirus is not much different from the common flu	179	31.2	188	32.8	155	27.0	52	9.1
Coronavirus is a means of reducing the population of the earth	130	22.6	170	29.6	185	32.2	89	15.5
Data on coronavirus infections are being deliberately manipulated	52	9.1	112	19.5	178	31.0	232	40.4

Note. *N* = number of participants.

Prevalence of misinformation and demographic variables

I used the Mann–Whitney *U* test to determine the differences in susceptibility to misinformation about the COVID-19 pandemic depending on variables such as gender, age, education, place of residence, and employment status. The first hypothesis postulated that men reported higher agreement with false opinions about the pandemic than women (Hypothesis 1). The results of the research showed that there were statistically significant relations between sharing false opinions about coronavirus and gender ($p < .05$). Men had a higher mean rank, being more inclined than women to agree with the opinions that coronavirus did not exist ($M_{\text{rank}} = 307.87$ vs. $M_{\text{rank}} = 277.26$, $U = 32761.5$, $p = .0001$) and that it did not differ much from the common flu ($M_{\text{rank}} = 311.59$ vs. $M_{\text{rank}} = 275.39$, $U = 32047.5$, $p = .01$). Gender did not differentiate the respondents' degree of agreement with the remaining items (see Table 3).

Table 3. COVID-19 misinformation and gender

	Women		Men		<i>U</i>	<i>z</i>	<i>p</i>
	<i>Mdn</i>	<i>M_{rank}</i>	<i>Mdn</i>	<i>M_{rank}</i>			
Face masks do not protect against coronavirus	3.00	278.50	3.00	305.40	33235.5	-1.89	.058
Some COVID-19 vaccines are dangerous	3.00	287.05	3.00	288.39	36501.0	-0.095	.924
Wearing face masks leads to the development of pulmonary mycosis	3.00	284.55	3.00	293.37	35545.	-0.625	.532
Coronavirus does not exist	1.00	277.26	1.50	307.87	32761.5	-2.33	.020
The SARS-CoV-2 coronavirus is not much different from the common flu	2.00	275.39	2.00	311.59	32047.5	-2.58	.010
Coronavirus is a means of reducing the population of the earth	2.00	290.93	2.00	280.68	35362.5	-0.73	.468
Data on coronavirus infections are being deliberately manipulated	3.00	282.62	3.00	297.21	34807.0	-1.05	.293

Note. *U* = Mann–Whitney test; *Mdn* = median; *p* = significance level; *M_{rank}* = mean rank; *z* = the value of the *z* statistic.

The second hypothesis postulated that respondents aged 18–30 years agreed with false opinions about the pandemic to a greater degree than respondents over 30 years of age (Hypothesis 2). The Mann–Whitney *U* test of independence showed significant differences between the age groups in terms of the prevalence of specific types of false information about the COVID-19 pandemic (see Table 4). Participants aged under 30 had a higher mean rank than the older group, as they more often subscribed to the opinions that masks did not protect against coronavirus ($M_{\text{rank}} = 301.35$ vs. $M_{\text{rank}} = 267.81$, $U = 33,235.5$, $p = .013$) and that wearing them led to pulmonary mycosis ($M_{\text{rank}} = 303.42$ vs. $M_{\text{rank}} = 264.86$, $U = 35545$, $p = .004$). They also more often agreed with the false opinions that coronavirus was not much different from the common flu ($M_{\text{rank}} = 304.80$ vs. $M_{\text{rank}} = 262.90$, $U = 32047.5$, $p = .002$), that some COVID-19 vaccines were dangerous ($M_{\text{rank}} = 314.53$ vs. $M_{\text{rank}} = 249.07$, $U = 36501.0$, $p = .000$), and that data on coronavirus infections were being deliberately manipulated ($M_{\text{rank}} = 308.69$ vs. $M_{\text{rank}} = 257.37$, $U = 34807.0$, $p = .000$). Age did

not differentiate participants' agreement with the remaining items, stating that coronavirus did not exist and that it was a means of reducing the population of the earth.

Table 4. COVID-19 misinformation and age

	Under 30 years old		Over 30 years old		<i>U</i>	<i>z</i>	<i>p</i>
	<i>Mdn</i>	<i>M_{rank}</i>	<i>Mdn</i>	<i>M_{rank}</i>			
	Face masks do not protect against coronavirus	3.00	301.35	2.00			
Some COVID-19 vaccines are dangerous	3.00	314.53	3.00	249.07	36501.0	-4.85	.000
Wearing face masks leads to the development of pulmonary mycosis	3.00	303.42	2.00	264.86	35545.0	-2.85	.004
Coronavirus does not exist	1.00	290.85	1.00	282.74	32761.5	-0.644	.519
The SARS-CoV-2 coronavirus is not much different from the common flu	2.00	304.80	2.00	262.90	32047.5	-3.12	.002
Coronavirus is a means of reducing the population of the earth	3.00	298.15	2.00	272.35	35362.5	-1.91	.056
Data on coronavirus infections are being deliberately manipulated	3.00	308.69	3.00	257.37	34807.0	-3.86	.000

Note. *U* = Mann-Whitney test; *Mdn* = median; *p* = significance level; *M_{rank}* = mean rank; *z* = the value of the *z* statistic.

The third hypothesis predicted that respondents with secondary or lower education would report a greater degree of agreement with false opinions about the pandemic than individuals with higher education (Hypothesis 3). Significant differences in the prevalence of all items of misinformation about the pandemic ($p < .05$) were found between groups with different levels of education (see Table 5). Participants with secondary or lower education had a higher mean rank than those with higher education, as they reported stronger agreement with the opinions that coronavirus did not exist ($M_{\text{rank}} = 322.22$, $U = 31715.0$, $p = .000$), that it did not

differ much from the common flu ($M_{\text{rank}} = 325.57, U = 30819.5, p = .000$), and that it was a measure of reducing the earth's population ($M_{\text{rank}} = 322.95, U = 31518.5, p = .000$). Subjects with secondary or lower education were more convinced that some COVID-19 vaccines were dangerous ($M_{\text{rank}} = 314.16, U = 33866.0, p = .000$), that data on coronavirus infections were being deliberately manipulated ($M_{\text{rank}} = 302.28, U = 37038.5, p = .035$), that wearing face masks did not protect against coronavirus ($M_{\text{rank}} = 307.79, U = 35567.5, p = .005$), and that it led to the development of pulmonary mycosis ($M_{\text{rank}} = 323.87, U = 31,275.0, p = .000$).

Table 5. COVID-19 misinformation and education

	Secondary or lower		Higher		<i>U</i>	<i>z</i>	<i>p</i>
	<i>Mdn</i>	M_{rank}	<i>Mdn</i>	M_{rank}			
Face masks do not protect against coronavirus	3.00	307.79	2.00	269.86	35567.5	-2.832	.005
Some COVID-19 vaccines are dangerous	3.00	314.16	3.00	264.31	33866.0	-3.746	.000
Wearing face masks leads to the development of pulmonary mycosis	3.00	323.87	2.00	255.87	31275.0	-5.094	.000
Coronavirus does not exist	2.00	322.22	1.00	257.31	31715.0	-5.223	.000
The SARS-CoV-2 coronavirus is not much different from the common flu	2.00	325.57	2.00	254.39	30819.5	-5.365	.000
Coronavirus is a means of reducing the population of the earth	3.00	322.95	2.00	256.67	31518.5	-4.966	.000
Data on coronavirus infections are being deliberately manipulated	3.00	302.28	3.00	274.65	37038.5	-2.103	.035

Note. *U* = Mann-Whitney test; *Mdn* = median; *p* = significance level; M_{rank} = mean rank; *z* = the value of the *z* statistic.

The analysis of the results using the Kruskal-Wallis *H* test did not show any significant differences in the prevalence of individual types of misinformation about the COVID-19 pandemic depending on employment status.

Discussion of the results

The aim of the study was to determine what misinformation about the SARS-CoV-2 coronavirus pandemic the respondents believed. Statistically significant relations were found between gender, education, and age and the acceptance of false information. It was thus confirmed that the three research hypotheses were correct. The only relationship that was not found is the one between respondents' acceptance of false information and their employment status.

The analysis shows that most respondents shared the false opinion that data on coronavirus infections were deliberately manipulated and that some COVID-19 vaccines were dangerous. About half of the respondents believed that face masks did not protect against coronavirus, that wearing them led to the development of pulmonary mycosis, and that coronavirus was a means of reducing the earth's population. The results of earlier research conducted in Poland confirm the social acceptance of some false information about COVID-19 (Duplaga, 2020). The 25 percentage of supporters of particular conspiracy theories in the sample ranged from 43% to 56%. Based on the research conducted by Roozenbeek et al. (2020), Wróblewski et al. (2020), and Geldsetzer (2020), it should be noted that the majority of respondents do not believe false information on COVID-19, but some of that information is considered reliable. Although subjects generally had adequate knowledge about the transmission of the coronavirus disease and its typical symptoms, they held several misconceptions about COVID-19 prevention. In addition, they believed the false information circulating on social media (Geldsetzer, 2020).

The results of the research reported in this paper show that there is a relationship between the acceptance of false opinions about the pandemic and gender, which supports the first hypothesis. Compared to women, more often agreed that coronavirus did not exist and that it was not much different from the common flu. The collected data are consistent with other research reports to date (Allington et al., 2021; Cassese, Farhart, Miller, 2021; Pickles et al., 2021), which demonstrate that women are much less likely than men to support conspiracy theories regarding COVID-19. On the other hand, women comply with the rules of the sanitary regime more often than men, wearing face masks on a daily basis (Gallup Poll, 2020). This tendency is explained by Roozenbeek et al. (2020), whose research showed that a preference for health-conscious behavior related to COVID-19 was associated with lower susceptibility to misinformation. It should be noted that men's belief in false information can be partially explained by two dispositional factors: learned helplessness and belief in conspiracy theories (Cassese, Farhart, Miller, 2021). Learned helplessness occurs when a person cannot influence the crisis they are experiencing. Uncontrolled traumatic events can cause passivity and inability to respond effectively; they can also lead to depression (Seligman, 1972).

Analyzing research results, I found that, compared to the older group, people under the age of 30 more often shared the views that masks did not protect against

coronavirus and that wearing them led to the development of pulmonary mycosis. Additionally, they were more inclined to subscribe to the opinions that coronavirus was not much different from the common flu, that some COVID-19 vaccines were dangerous, and that data on coronavirus infections were deliberately manipulated. The presented data support the second hypothesis. These results support the findings of other studies, indicating that COVID-19 conspiracy theories are more common in younger people than in older adults (Duplaga, 2020; Allington et al., 2021; Pickles et al., 2021). It should be noted that health promoting behaviors were more often preferred by seniors (Allington et al., 2021). Research has shown that older adults use different media than young people. Seniors are more likely to reject conspiracy theories and engage in health-promoting behaviors because they tend to use broadcast media, such as radio and television, rather than social media (Allington et al., 2021).

The research results presented in this report indicate that respondents with secondary or lower education more often agreed with all false statements about the pandemic compared to respondents with higher education, which confirms that the third hypothesis was correct. This tendency is supported by research conducted in Australia (Pickles et al., 2021), which shows that stronger agreement with misinformation is associated, among other variables, with a lower level of education. Research conducted in the United States indicates that, compared to subjects with secondary or lower education, people with higher education less often believed that coronavirus was created in a laboratory (Schaeffer, 2020). Increased susceptibility to misinformation among people with secondary or lower education is associated with difficulties in finding and assessing health information from electronic resources. For this reason, they are less able to cope with health problems (Pickles et al., 2021). Moreover, it has been found that the greater acceptance of false information about the pandemic among people with secondary or lower education is associated with a low sense of threat from COVID-19. This may result in less frequent compliance with the rules of the sanitary regime in this group of people. This correlation is confirmed by the research conducted by Gallup Poll (2020), which showed that people with lower education followed the rules of health safety less often than university graduates.

Limitations and implications

The study presented in this paper has some limitations. Due to the epidemic situation, participants were recruited using snowball sampling, via email and through social media. It should be noted, however, that some people rarely use email or have no social media accounts, which may have contributed to the small number of older adults in the sample. Moreover, there were more women than men among the participants. When analyzing the results, it is necessary to consider the characteristics of the sample and exercise special interpretative caution. Further studies should include larger and more representative samples.

Conclusions

The material collected in the course of the research and the analyses performed showed that during the third wave of the SARS-CoV-2 coronavirus pandemic most respondents agreed with false information about COVID-19. The results suggest that men, young people, and people with secondary or lower education are the most exposed to misinformation.

In this context, it is worth emphasizing that the promotion of false information, rumors, and conspiracy theories may lead to ignoring safety rules and, consequently, to putting one's own and other people's health at risk. Due to the dynamic and unpredictable development of the epidemic situation, it is advisable to conduct further research on the spread of misinformation related to the pandemic. The obtained data will provide knowledge about the specificity and development of the infodemic. On this basis, it will be possible to take adequate measures targeted at the groups most vulnerable to misinformation and its negative effects.

The applied strategies should take the form of a stable and homogeneous system that limits the spread of harmful content. Priority should be given to disseminating up-to-date scientific knowledge and developing health competencies.

There is a need to stimulate society to think more critically and to increase confidence in the results of scientific research on COVID-19 (Roozenbeek et al., 2020). People responsible for providing accurate information on the pandemic need to understand the main features of misinformation emerging on social media about COVID-19 (Biancovilli, Makszin, Jurberg, 2021) to be able to develop interesting and authoritative content that will help raise public health awareness and prevent the dissemination of the infodemic.

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INFODEMIA W OKRESIE PANDEMII
KORONAWIRUSA SARS-COV-2 W POLSCE

Streszczenie. Wybuchowi pandemii koronawirusa SARS-CoV-2 towarzyszyło rozprzestrzenianie się wielu nieprawdziwych informacji, plotek i teorii spiskowych określanych terminem infodemia. Celem badania było określenie, z jakimi dezinformacjami na temat COVID-19 identyfikowali się Polacy podczas trzeciej fali pandemii. Ankieta składała się z części demograficznej oraz siedmiu pozycji dotyczących dezinformacji na temat pandemii. Wyniki badań wskazują, że większość respondentów uważało, że celowo manipuluje się danymi na temat zakażeń koronawirusem (71,4%) oraz że niektóre szczepionki przeciw COVID-19 są niebezpieczne (62,4%). Mężczyźni, w porównaniu do kobiet, bardziej utożsamiali się z fałszywymi informacjami, że koronawirus nie istnieje oraz nie różni się wiele od zwykłej grypy. Osoby z wykształceniem co najwyżej średnim bardziej identyfikowały się ze wszystkimi fałszywymi stwierdzeniami na temat pandemii, w porównaniu do badanych z wyższym wykształceniem. Uzyskane wyniki badań można wykorzystać w celu zapobiegania negatywnym konsekwencjom infodemii.

Słowa kluczowe: infodemia, koronawirus, COVID-19, dezinformacja

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