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Use of information sources in Covid-19 pandemic and its relation with knowledge and anxiety

Wykorzystanie źródeł informacji w pandemii Covid-19 i jej związek z wiedzą i lękiem

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STRESZCZENIE

WYKORZYSTANIE ŹRÓDEŁ INFORMACJI W PANDEMII COVID-19 I JEJ ZWIĄZEK Z WIEDZĄ I LĘKIEM

Wprowadzenie. Wytwarzanie przydatnych informacji podczas pandemii jest kluczowym elementem strategii kontroli epidemii.
Cel pracy. Ponieważ żadne badanie nie zbadało jeszcze, jakie źródła informacji zostały wykorzystane w pandemii COVID-19 i jak korzystanie ze źródeł informacji jest powiązane z wiedzą i lękiem, niniejsze badanie próbuje wypełnić lukę badawczą.
Materiał i metodyka. Przeprowadziliśmy badanie eksploracyjne wśród 7764 mieszkańców Słowenii, aby ocenić wykorzystanie źródeł informacji, wiedzy i lęku oraz określić związek między różnymi źródłami informacji a wiedzą i lękiem wśród laików w Słowenii podczas pandemii COVID-19.
Wyniki. Często wykorzystywanymi źródłami informacji było połączenie nieuregulowanych internetowych źródeł informacji i regulowanych źródeł informacji. Internet jako główne źródło był chętniej wykorzystywany przez osoby młodsze i lepiej wykształcone. Z tradycyjnych środków masowego przekazu i organizacji religijnych częściej korzystali starsi uczestnicy, natomiast przyjaciele i/lub krewni i/lub koledzy oraz terapeuci medycyny naturalnej, byli źródłem informacji częściej dla osób młodszych. Wyniki pokazują również, że większy niepokój wiąże się z większym zapotrzebowaniem na informacje.
Wnioski. Informowanie ludzi nie powinno opierać się przede wszystkim na tradycyjnej komunikacji interpersonalnej między lekarzem a pacjentem, innej komunikacji twarzą w twarz lub na wykorzystaniu informacji drukowanych, ale raczej na regulowanych i nieuregulowanych stronach internetowych, mediach społecznościowych i telewizji.

Słowa kluczowe: Pandemia COVID-19, lęk, źródła, wiedza, komunikacja

ABSTRACT

USE OF INFORMATION SOURCES IN COVID-19 PANDEMIC AND ITS RELATION WITH KNOWLEDGE AND ANXIETY

Introduction. Production of useful information during a pandemic is a key element of outbreak control strategies.
Aim. As no study has yet examined what information sources were used in the COVID-19 pandemic and how the use of information sources is related to knowledge and anxiety, this research tries to fill the research gap.
Material and methods. We conducted an explorative study among 7,764 Slovenian population to assess the use of information sources, knowledge, and anxiety, and determine the relationship between different information sources and knowledge and anxiety in lay public in Slovenia during the pandemic of COVID-19.
Results. A combination of unregulated internet-based information sources and regulated ones were frequently used information sources. The Internet as the main source was more used by younger and more educated individuals. Traditional mass media and religious organizations were more frequently used by older participants, while friends and/or relatives and/or colleagues and natural therapist by younger participants. Results also show that greater anxiety is associated with the greater need for information.
Conclusion. Informing people should not primarily be based on the traditional interpersonal communication between a doctor and patients, other face-to-face communication or the use of printed information, but rather on regulated and unregulated websites, social media, and TV.

Key words: COVID-19 pandemic, anxiety, sources, knowledge, communication

INTRODUCTION

The pandemic of COVID-19 has profoundly affected the way people live and work around the world. In order to develop effective information strategies in crisis situations, such as COVID-19 pandemic, it is important to understand individuals' use of information sources and how it is related to their knowledge and anxiety. Patient information sources are associated with better knowledge or worse anxiety levels [1]. Namely, if good quality information sources may improve disease-related patient knowledge, it is also conceivable that some information sources may cause anxiety [2].

Health anxiety, defined as an excessive, unwarranted fear, provoked by a perceived health threat [3], occurring on a continuum [4] that ranges from very low, which may lead to failure to engage in recommended health measures and during times of a pandemic could lead to spreading the virus, to high by developing maladaptive behaviours, such as excessive avoidance, unnecessarily seeking of medical reassurance [5]. The informational age exposes us to an abundance of data and also their distortions about health and illness, which add to our vulnerability to overestimate the risk of and vulnerability to disease. Such fears lead to unhealthy practices that may contribute to the burden of the pandemic [5].

Effective communication in public health is a key component during a pandemic emergency [6], such as the outbreak of COVID-19. The pandemic crisis has a high personal impact [7] and the highest news value [8], i.e. the highest possibility for the news media to cover them. It is not surprising that the Internet and social media have become an important source for health information, especially government and other authorities' websites [6]. However, a survey carried out among the general population in Germany and Malaysia during the influenza A H1N1 pandemic in 2009/10 demonstrated that conventional media sources such as television, radio, and newspapers were more frequently used than the Internet that was more used by younger and more educated individuals [7,8]. An Australian qualitative analysis showed that during the 2009 influenza A H1N1 pandemic, a context media reliance was considered necessary, but not quite untrustworthy. Doctors were seen as trustworthy sources, but difficult to access; therefore, Australians did not primarily seek information there [4]. In Germany, 31% stated to obtain information from doctors. However, some people are more likely to use the Internet for such information (e.g. younger and more educated people) [6,9]. As the Internet with social media radically changed the way epidemiological information is disseminated and accessed, information and knowledge gaps and anxiety level among different population groups might be reduced. On the other side, anxiety is related to increased use of (online) health information [4,10]. The British study on the association of use of information sources, knowledge and anxiety demonstrated that disease-related knowledge was associated with a number of factors. More educated patients with inflammatory bowel disease had better disease-related knowledge. A number of information sources were associated with worse levels of anxiety, including the use of general practitioners, alternative health websites, and random unchecked links generated by search engines [1].

AIM

As no study has yet examined what information sources were used in the COVID-19 pandemic and how the use of information sources is related to knowledge and anxiety, this research aims to fill the research gap. The hypothesis that the use of some information sources contributes to better knowledge and/or worse anxiety levels in the case of the pandemic has not been investigated so far.

MATERIALS AND METHOD

This cross-sectional study was conducted in Slovenia in March 2020 during the peak point of the pandemic in Central Europe. The online survey was disseminated using snowball sampling. Participants were asked to complete a self-administrated, structured electronic questionnaire. Of 7,764 respondents total, 79% were women and 22% – men (women – 51.2% and men – 48.8% of the total country population). Their age ranged from 13 to 83 years (mean 40.5), with 4.8% aged 65 years or more. As many as 45% had secondary school education, 41% had an undergraduate degree, and 15% – postgraduate degree.

The online questionnaire consisted of four groups of questions based on (1) socio-demographic factors, (2) use of information sources regarding the COVID-19 pandemic, (3) knowledge on COVID-19, (4) and anxiety. The questionnaire was based on previous studies on information sources [9], adapted to the pandemic situation and it assessed the frequency of use of information sources using 5-point Likert scales (never, rarely, sometimes, often, always). For the assessment of respondents' knowledge about coronavirus, epidemiologic situation, and adequate preventive measures, we assessed their agreement with 13 statements (Table 2.) with possible answers 'I agree', 'I don't agree' or 'I don't know'. The set of statements was designed based on current relevant knowledge about the coronavirus and epidemiologic data [10-13]. The knowledge score was calculated as a sum of marks for single answers (correct answer: +1, don't know: 0, wrong answer: -1). Anxiety was measured using the Generalized Anxiety Disorder 7-item, GAD-7 [9].

The institutional ethics committee approved the study (FZV-98/2020).

RESULTS

Figure 1. shows that the most frequent use of information sources included unregulated health websites and random unchecked links generated by search engines (84.5%), TV (70.7%), Slovenian Institute of Public Health (62.5%), different social media (61.5%), and the Ministry of Health and other government institutions (57.1%).

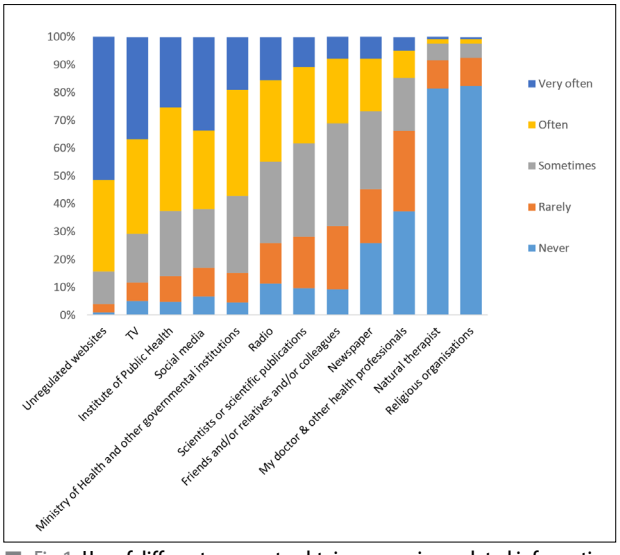

Fig 1. Use of different sources to obtain coronavirus-related information

The results of the Spearman's rank correlation coefficients calculation show a statistically significant association between information sources and gender in all analysed sources except religious organisations and natural therapists. Since gender was coded as 1-male and 2-female, positive correlation coefficients means more frequent use of information source in women (Tab. 1.). Thus, women used unregulated health websites, social media, official health and government sources more frequently than men.

Tab. 1. Spearman's Correlations coefficient between the information sources and demographic characteristics

Information sources	Gender	Age	Educational level
My doctor & other health professionals	0.023*	0.012	-0.038**
Scientists or scientific publications	0.062**	0.003	0.099**
Ministry of Health and other government institutions	0.136**	-0.009	0.054**
Institute of Public Health	0.148**	-0.006	0.105**
Religious organisations	0.019	0.040**	-0.076**
Friends or / and relatives or / and colleagues	0.084**	-0.117**	-0.068**
Natural therapist	0.017	-0.051**	-0.054**
Newspaper	0.063**	0.114**	0.031**
Radio	0.041**	0.106**	-0.057**
TV	0.105**	0.124**	-0.019
Unregulated websites	0.062**	-0.064**	0.035**
Social media	0.119**	-0.011	-0.084**

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

There was a statistically significant association between religious organizations and age, with the elderly citing them as a source more frequently. Table 1. also shows a statistically significant association between information sources and education level in all analysis sources except TV. Since education was coded as 1-lowest to 4-highest, a positive correlation means more frequent use of information source in more educated participants. Family doctor and other health professionals, religious organisations, friends and/or relatives and/or colleagues, natural therapists, radio and social network sites were more frequently used information sources in less-educated participants.

Table 2. shows participants' knowledge about the coronavirus COVID-19. The vast majority of participants (over 90%) was aware of the national epidemic and global pandemic; nevertheless, more than half (51.7%) overestimated the number of deaths globally due to coronavirus at the time of the survey. Only 19.6% of participants correctly agreed with the statement that the coronavirus belonged to a family of RNA viruses.

Tab. 2. Knowledge about the coronavirus

	Correct answer	Incorrect		Don't know		Correct	
		N	%	N	%	N	%
There is currently the worldwide pandemic of COVID-19.	yes	395	5.1	232	3.0	7090	91.9
There is currently the COVID-19 epidemic in Slovenia.	yes	415	5.4	163	2.1	7121	92.5
Healthy people do not get infected with COVID-19.	no	321	4.2	519	6.7	6877	89.1
In addition to the coronavirus and influenza virus, other viruses can also cause respiratory diseases.	yes	131	1.7	761	9.9	6827	88.4
Healthy people cannot be carriers of the new coronavirus.	no	583	7.6	545	7.1	6586	85.4
There are effective antiviral medicines for the treatment of COVID-19.	no	266	3.4	1369	17.7	6086	78.8
The coronavirus can be destroyed by a 60% alcohol disinfectant.	yes	1899	24.6	1609	20.8	4210	54.5
Mortality is higher with COVID-19 than with influenza.	yes	2243	29.1	1466	19.0	4010	51.9
COVID-19 epidemic can only be stopped by vaccination.	no	888	11.5	2958	38.4	3866	50.1
The coronavirus can be destroyed by freezing.	no	482	6.2	3489	45.2	3747	48.5
More than 100,000 people have died in the world in recent months due to the coronavirus.	no	1872	24.3	2111	27.4	3723	48.3
SARS-CoV-2 infection is thought to be transmitted to humans through animals.	yes	2751	35.7	2586	33.5	2377	30.8
The coronavirus belongs to RNA viruses.	yes	478	6.2	5712	74.2	1510	19.6

Table 3. demonstrates which sources contribute to improved knowledge and which achieved the opposite. It shows statistically significant associations between information sources and knowledge scores on the coronavirus in all information sources except in cases of the respondent's doctor and other health professionals, newspaper, and television.

Tab. 3. Spearman's correlations coefficient between frequency of use of listed information sources and knowledge scores on the coronavirus

Information sources	Spearman correlation coefficient	Sig. (2-tailed)
My doctor & other health professionals	-0.002	0.879
Scientists or scientific publications	0.164**	0.000
Ministry of Health and other government institutions	0.151**	0.000
Institute of Public Health	0.173**	0.000
Religious organisations	-0.077**	0.000
Friends and/or relatives and/or colleagues	-0.049**	0.000
Natural therapist	-0.136**	0.000
Newspaper	-0.002	0.836
Radio	-0.054**	0.000
TV	-0.014	0.208
Unregulated websites	0.104**	0.000
Social media	-0.077**	0.000

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Table 4. shows that there are statistically significant associations between information sources and anxiety for all information sources except in the case of a natural therapist. Higher levels of anxiety are associated with a greater need for the amount of information and more frequent use of information sources.

Tab. 4. Correlation of information sources with anxiety

Information sources	Spearman Correlation Coefficient	Sig. (2-tailed)
My doctor & other health professionals	0.059**	0.000
Scientists or scientific publications	0.054**	0.000
Ministry of Health and other government institutions	0.100**	0.000
Institute of Public Health	0.102**	0.000
Religious organisations	0.039**	0.001
Friends and/or relatives and/or colleagues	0.082**	0.000
Natural therapist	0.007	0.537
Newspaper	0.064**	0.000
Radio	0.051**	0.000
TV	0.083**	0.000
Unregulated websites	0.095**	0.000
Social media	0.106**	0.000

DISCUSSION

Informing people is imperative to make educated decisions that ultimately protect persons against infection during pandemics [14]. This is the first study to investigate whether the use of different information sources is associated with individuals' knowledge or anxiety during pandemics.

The current study on a large number of Slovenians demonstrated that participants use a combination of unregulated internet-based information sources (websites and social media) and regulated ones (TV, official health and government institutions). Family doctor and other health professionals were less frequently chosen sources. It is not surprising that unregulated health websites and random unchecked links generated by search engines and social media have become the most important source for health information, as the Internet has become a significant source of health information by the majority individuals [6]. During the pandemic, obtaining information via the Internet-based social media was substituted with face-to-face communication between friends, relatives or colleagues and family doctor due to social distancing. Compared to previous studies on the use of information sources during the influenza A H1N1 pandemic in 2009/10, when conventional media sources such as television, radio and newspapers were the most frequent sources of information [9], it can be argued that during the COVID-19 pandemic, the use of the Internet was prevalent due to its widespread accessibility/availability.

Consistent with previous studies on conducting information source during the influenza A H1N1 pandemic in 2009/10, the Internet was predominantly used by younger and more educated people [9], although, the gap between users and non-users of the Internet as a key information source is far from as big as 10 years earlier. Unsurprisingly, more educated participants also more frequently utilize scientific publications, government and other institutions and the newspaper, as scientific publications and newspapers are read by higher educated people [15].

Participants mainly lacked knowledge about some facts about the new coronavirus: that it belongs to a family of RNA viruses, that SARS-CoV-2 infection was thought to be transmitted to humans through animals, and that it could not be destroyed by freezing. Respondents showed more knowledge about the epidemic of COVID-19 than biological characteristics of the new coronavirus. Knowledge proficiency about transmission and epidemiological situation was also reported by a similar Chinese study [16].

Results confirm the hypothesis that the use of some information sources contributes to better knowledge. Namely, the frequent use of some sources, such as the official health and government institutions and unregulated websites, contributes to better knowledge and the use of others, such as natural therapists, religious organizations, social media and radio, contributes to poorer knowledge. This is only partly in line with a British study establishing that the frequent use of regulated websites and face-to-face information by health professionals was associated with better knowledge, and the use of unregulated websites was not [1]. Although online health information is not always peer-reviewed, in the last years, the number of websites providing reliable health information has increased, and people have at least partially acquired the skills to select credible information websites [17]. Not surprisingly, the use of natural therapists, religious organizations, and social media contributes to poorer knowledge, since

they can disseminate unverified, false, or inaccurate information [18].

Results partly confirm the hypothesis that the frequent use of different information sources is connected to higher anxiety levels in the case of COVID-19 pandemic. It could be assumed that a higher level of anxiety triggers the need for more information.

CONCLUSIONS

The findings suggest a continued focus on the use of unregulated health websites and social media or TV, as well as official health and other government institutions as first-line education point. Thus, informing people should not primarily be based on the traditional interpersonal communication between a doctor and patients, other face--to-face communication or the use of printed information, but rather on regulated and unregulated websites, social media, and TV. Because many also frequently use social media, individuals should be advised to treat such unregulated sources with caution. Additionally, people should be guided towards official healthcare organisations' websites and other government organisations to spread specific and useful information during a pandemic.

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