

Mateusz Kobryn

Dr Mariusz Duplaga

Department of Health Promotion and e-Health, Institute of Public Health, Faculty of Health Sciences, Jagiellonian University Medical College, Krakow, Poland
m.kobryn@doctoral.uj.edu.pl, mariusz.duplaga@uj.edu.pl

CYBERCHONDRIA AS A BY-PRODUCT OF EXTENSIVE USE OF HEALTH-RELATED INFORMATION ON THE INTERNET

Introduction

An excessive attention to syndromes self-diagnosed online is a characteristic feature of cyberchondria. Cyberchondria results in exaggerated health anxiety provoked by browsing the content available online. Public health professionals need to be aware of cyberchondria-like consequences resulting from the overwhelming access to online health-related information. In this paper, the challenges from searching for electronic health information are explored, also in relation to possible countermeasures against disinformation and increasing medicalisation of the society taking sometimes a form of cyberchondria.

1. Online health information and medicalisation of the society

Searching for health information on the Internet is a common practice in modern societies¹. Many surveys showed that majority of the Internet users over world went online to diagnose their ailments². The features that make the Internet a popular source of health-related information include anonymity, low cost, accessibility, and convenience³. Besides, the Internet is a permanently available; the access can be personalised and adapted to user's needs^{4,5}. Health information-seeking behaviours can positively influence people's condition by giving the

¹ M. M. Bujnowska-Fedak, J. Waligóra, A. Mastalerz-Migas, *The Internet as a Source of Health Information and Services* [in]: M. Pokorski (ed.) *Advancements and Innovations in Health Sciences*, "Springer International Publishing", 2019, pp. 1–16.

² E. Ulatowska-Szostak, J.T. Marcinkowski, M. Gromadecka-Sutkiewicz, M. Krzywińska-Wiewiórowska, et al., *The research of Internet as the source of information about a disease*, "Problemy Higieny i Epidemiologii", 2009, No. 90(2), pp. 246-253.

³ R. J. Cline, K. M. Haynes, *Consumer health information seeking on the Internet: the state of the art*, "Health Education Research", 2001, No.16(6), pp. 671-692.

⁴ P. Siuda M. Pluta, *Doświadczenie zdrowia i choroby w dobie Internetu*, (in:) J. Burczyk (ed.) *Internet, zdrowie i choroba- powiązania społeczne, kulturowe i edukacyjne*, Wydawnictwo Uniwersytetu Kazimierza Wielkiego, Bydgoszcz 2020, pp. 1-14.

⁵ J. Kivits, *Everyday health and the internet: A mediated health perspective on health information seeking*. "Sociology of Health & Illness", 2009, No.31(5), pp. 673–687.

reassurance⁶ and the sense of personal development. Furthermore, it seems that accessing to online health-related information may positively influence the communication with health providers.

On the other hand, persons accessing health-related information available on the Internet may be urged to search for medical-like explanation of common every-day feelings and experiences⁷. This phenomenon is related to the medicalisation of online spaces understood as “(...) adopting a medical framework to understand the problem or using medical interventions to solve the problem.”⁸. Defining illness as the state of “non-health” seems to contribute to this trend^{9,10}. As a consequence, patient's self-diagnosis becomes the basis for determining health impairment, a subjective statement of feeling unwell¹¹.

As revealed by the study by Ulatowska-Szostak et al., we can observe a disturbing situation in which, the Internet is the only source of information about health or illnesses for many people. Simultaneously, only 20.5% of respondents considers the Internet as a reliable source of information¹². Furthermore, there is a large group of Internet users that believe that online health-related information is not consistent with the information provided by evidence-based sources¹³.

Seeking health-related information on the Internet can be considered as “distancing” oneself from the “unbiased” knowledge of traditional medical professionals¹⁴. It is not uncommon that laymen prefer to relay on their own knowledge or content found on the web than on what their doctors say. Unfortunately, the content of online medical forums and blogs is frequently a mix of proved information and accounts of subjective experience, values, and even emotions. Moreover, it happens that business-driven entities encourage people to exchange online opinions and experiences about diagnosis or treatment to attract other users of medical products. Such organisations are well aware that patients often trust their peer patients

⁶ M. Lemire, C. Sicotte, G. Paré, *Internet use and the logics of personal empowerment in health*, “Health Policy”, 2008, No.88(1), pp. 130 – 140.

⁷ A. Miah, E. Rich, *The Medicalization of Cyberspace*, Routledge, 2008, pp.1-21.

⁸ P. Conrad, *Medicalization and Social Control*, “Annual Review of Sociology”, 1992, No.18., p. 221.

⁹ B. Uramowska-Żyto, *Zdrowie i choroba w świetle wybranych teorii socjologicznych*, wyd. iFiS PAN, Warszawa 1992, p. 6.

¹⁰ W. Piątkowski, *Zdrowie, choroba, społeczeństwo. Studia z socjologii medycyny*, DGM Informationsgesellschaft, Lublin 2004, p. 1-31.

¹¹ M. Sokołowska, *Granice medycyny*, Warszawa 1980, pp.125-126.

¹² E. Ulatowska-Szostak, J.T. Marcinkowski, et al., *The research ...*, *Op. Cit.* pp. 246-253.

¹³ G. Eysenbach, J. Powell, O. Kuss, E. R. Sa, *Empirical studies assessing the quality of health information for consumers on the World Wide Web a systematic review*, “JAMA”, 2002, No. 287, pp. 2691-2700.

¹⁴ M. McMullan, *Patients using the Internet to obtain health information: how this affects the patient –health professional relationship*, “Patient Education and Counselling”, 2006, No.63(1), pp. 24 –85.

more than health professionals using medical jargon or providing only limited information about handling every day challenges^{15,16}. In the results, the patients participating in online forums or blogs unconsciously (or consciously) become involved in advertising treatments, products or services. Some websites or online forums may deliberately incite fear and anxiety to convince their users about necessity of specific treatments. There are authors who believe that stakeholders involved in healthcare market, not only politicians, but also healthcare professional and even patients, may act as the “agents” of the pharmaceutical industry^{17,18}. The influence of “big pharma” on prescribing behaviours of physicians was reported earlier^{19,20}. The resulting landscape of interrelations between healthcare providers, industry and patients themselves may be a source of significant confusion for consumers of health-related information available profusely on the Internet.

It is a common finding that Internet users feel overwhelmed by conflicting or inaccurate online information²¹. Baumgartner & Hartmann observed that too frequent online searches for information about alleged medical conditions can be a sign of health anxiety and a conviction about being seriously ill²². Study performed by Tyrer et al. has identified the financial and time costs of visits and diagnostic interventions associated with irrational health concerns triggered by internet information²³.

The multidimensional communication model with overlapping roles of a sender and a receiver of information, prevails in modern media²⁴. From one hand, the participation in online

¹⁵ P. Polak, *Nowe formy korupcji. Analiza socjologiczna sektora farmaceutycznego w Polsce*, Nomos, Kraków 2011, pp. 1–37.

¹⁶ J. Abraham, *The sociological concomitants of the pharmaceutical industry and medications*. [in:] *Handbook of medical sociology*, C. E. Bird, P. Conrad, et al. (ed.), “University Press”, Nashville, 2010, pp.209–308.

¹⁷ D. Light, J. Lexchin, J. J. Darrow, *Institutional corruption of pharmaceuticals and the myth of safe and effective drugs*, “The Journal of Law, Medicine & Ethics”, 2013, No. 14(3), pp. 590–610.

¹⁸ M. Makowska, M. Nowakowski, *Socjologia farmaceutyków jako "subpole" socjologii medycyny*, „Przegląd Socjologiczny”, 2018, No. 67(4). pp. 97-115.

¹⁹ S. Sunita, A. Fugh-Berman, *Physicians under the influence: Social psychology and industry marketing strategies.*, “The Journal of Law, Medicine & Ethic”, 2013, 41(3), pp. 665–672.

²⁰ J. P. Orłowski, L. Wateska, *The effects of pharmaceutical firm enticements on physician prescribing patterns. there's no such thing as a free lunch*, “Chest”, 1992, No. 102(1), pp. 270–273.

²¹ Y. Leykin, R.F. Muñoz, O. Contreras, *Are consumers of Internet health information "cyberchondriacs"?* *Characteristics of 24,965 users of a depression screening site*, “Depression and Anxiety”, 2012, No. 29(1), pp. 71–77.

²² S. E. Baumgartner, T. Hartmann, *The role of health anxiety in online health information search*, *Cyberpsychology, Behaviour, and Social Networking*, 2011, No. 14(10), pp. 613–618.

²³ P. Tyrer, S. Cooper, H. Tyrer H., D. Wang D, et al., *Increase in the prevalence of health anxiety in medical clinics: Possible cyberchondria*, “International Journal of Social Psychiatry”, 2019, No. 65(7-8), pp. 566-569.

²⁴ A. Jaskiernia, *Publiczne media elektroniczne w Europie*, ASPRA-JR, Warszawa 2006, pp. 32–33.

patients communities may be a sign of patient empowerment²⁵. On the other hand, mixing of roles in health communication may be a source of the confusion to some patients.

2. Defining cyberchondria

The use of health-related information available on the Internet may be perceived as the manifestation of a need for reassurance when somebody is concerned about their health²⁶. On the other hand, it was shown that such concerns may also be amplified by searching and accessing such information^{27,28}. In extreme cases, an augmented anxiety about own health may evolve to cyberchondria (also referred to as compucondria). It is defined as “abnormal behavioural pattern in which excessive or repeated online searches for health-related information are distressing or anxiety-provoking”²⁹. A prominent feature of this affliction is the unfounded escalation of concern about one's own health in the presence of common symptoms³⁰. Some authors postulate that cyberchondria is one of the manifestations of hypochondria understood as “a constant, unspecific and persistent fear for one's own health”³¹. Another important feature of cyberchondria is the self-diagnosis based on Internet sources³². The pattern of behaviour typical for cyberchondria is characterised by repetitiveness and escalation; therefore it may be stressogenic and destructive when individual is trying to focus on other activities. People suffering from cyberchondria may remain in a vicious circle in which excessive use of the Internet for self-diagnosis is accelerated even if they experience an augmented feeling of anxiety³³. Frequently, cyberchondria symptoms are time and energy consuming. Some authors emphasise a dysfunctional, maladaptive nature of cyberchondria and

²⁵ N. Kordzadeh, J. Warren, *Toward a typology of health 2.0 collaboration platforms and websites*, “Health and Technology”, 2013, No. 3(1), pp. 37-50.

²⁶ V. Starcevic, D. Berle, *Cyberchondria: towards a better understanding of excessive health-related Internet use*, “Expert Review of Neurotherapeutics”, 2013, No.13(2), pp. 205-213.

²⁷ R. White; E. Horvitz, *Cyberchondria: Studies of the escalation of medical concerns in Web search*, ACM “Transactions on Information Systems”, 2009, No. 27(4), pp. 1–37.

²⁸ K. Muse, F. McManus, C. Leung, B. Meghreblian, et al., *Cyberchondriasis: Fact or fiction? A preliminary examination of the relationship between health anxiety and searching for health information on the Internet*, “Journal of Anxiety Disorders”, 2012, No. 26(1), pp. 189–196.

²⁹ R. D. McMullan, D. Berle, S. Arnáez, V. J. Starcevic, *The relationships between health anxiety, online health information seeking, and cyberchondria: Systematic review and meta-analysis*. “Journal of Affective Disorders”, 2019, No. 15(245), pp. 270-278.

³⁰ R. W. White, E. Horvitz, *Cyberchondria: Studies of the escalation ...*, pp. 1–37. *Op cit.*

³¹ J. Hart, T. Björgvinsson, *Health anxiety and hypochondriasis: Description and treatment issues highlighted through a case illustration*, “Bulletin of the Menninger Clinic”, 2010, No.74(2), pp. 122-140.

³² R. W. White, E. Horvitz, *Experiences with web search on medical concerns and self-diagnosis*, AMIA Annual Symposium Proceedings, 2009, pp. 696–700. PMID: PMC2815378.

³³ E. R. Doherty-Torstrick, K. E. Walton, B. A. Fallon, *Cyberchondria: Parsing Health Anxiety From Online Behavior*, “Psychosomatics”, 2016, No. 57(4), pp. 390–400.

its association with obsessive-compulsive tendencies. People with cyberchondria experience obsessive doubts and intrusive thoughts about the disease while searching for information and undertake a compulsive action to verify them^{34,35}.

The relationship between cyberchondria and uncertainty intolerance was also reported. Lower tolerance for uncertainty may confer vulnerability for cyberchondria. The study performed by Fergus revealed that the relationship between the frequency of searching for health information online and health anxiety became stronger as uncertainty intolerance increased³⁶. White & Horvitz commented that “biases of judgment” may be important in searching for psychological basis of cyberchondria. According to these authors, people who search for ailments on the Internet, overexpose themselves to detailed and varied descriptions of the symptoms of diseases and do not consider the real probability of events. They may also tend to confirm their preconceptions or hypotheses³⁷. This explanation refers to phenomenon known in psychology as confirmation bias. It was discovered by Tversky & Kahneman who showed that people searching for health-related information on the Internet equate the ranking of a list of results of the query with the likelihood of relevant disorders³⁸. Users who were searching for the diagnosis by browsing the list of mild and common symptoms on a website, were often linking them with a suggestion of serious illness. The recognition of a serious disease based on popular symptoms was a predictor of subsequent escalation of medical predictions³⁹. Doherty-Torstrick et al. suggested that the users of specific websites tend to suspect rare and unlikely conditions as the source of their health complains, because the diagnosis suggestion commonly presented to them is with no regard to the relevant risk factors, incidence or prevalence. Since many benign ailments are listed side-by-side and may share symptoms with serious diseases, users without professional medical advice can assume more consequential rather than the likely recognitions⁴⁰. It is also worth to mention that Internet users may present

³⁴ A. M. Norr, M. E. Oglesby, A. M. Raines, R. J. Macatee, et al., *Relationships between cyberchondria and obsessive-compulsive symptoms*, “Psychiatry Research”, 2015, No. 230(2), pp. 441–446.

³⁵ T. A. Fergus, L.H. Russell, *Does cyberchondria overlap with health anxiety and obsessive-compulsive symptoms? An examination of latent structure and scale interrelation*, “Journal of Anxiety Disorders”, 2016, No. 38, pp. 88–94.

³⁶ T. A. Fergus, *Anxiety sensitivity and intolerance of uncertainty as potential risk factors for cyberchondria: A replication and extension examining dimensions of each construct*, “Journal of Affective Disorders”, 2015, No. 184, pp. 305–309.

³⁷ R. W. White, E. Horvitz, *Experiences with web search...*, *Op. cit.*, pp. 696–700.

³⁸ A. Tversky, D. Kahneman, *Judgment under uncertainty: Heuristics and biases.*, “Science”, 1974, No 185(4157), pp. 1124–1131.

³⁹ R.W. White, E. Horvitz, *Predicting escalations of medical queries based on web page structure and content*, Proceedings of ACM SIGIR Conference on Research and Development in Information Retrieval, 2010, p. 769.

⁴⁰ E. R. Doherty-Torstrick, K. E. Walton, et al., *Cyberchondria: Parsing Health ...*, pp. 390–400., *Op. cit.*

different predisposition to escalating and persisting in post-searching anxiety leading to repetitive, multiple search sessions⁴¹. Brittany et al. also showed that cyberchondria was associated with functional impairment and increased healthcare utilization⁴².

3. Measuring cyberchondria

There are many challenges posed by self-diagnosis based on the information originating from the Web against, especially in the face of the crisis of trust in medical and scientific authorities. Apart from a destructive impact of cyberchondria on individual life, it may lead to wider consequences involving both patient's family and the society. The hypochondriac users of the Internet arouse and exacerbate anxiety in others. This may lead to increased expenses related to unwarranted medical visits and diagnostics, and finally, to additional financial burden imposed on the healthcare system.

There are several approaches to defining cyberchondria⁴³ as a specific condition, but not many measuring tools has been developed. McElroy & Shevlin developed most popular-Cyberchondria Severity Scale (CSS), a 33 items tool measuring overall cyberchondria score and subscores in five dimensions including compulsion, distress, excessiveness, reassurance seeking and mistrust of medical professional⁴⁴. It was widely adapted to other languages; shorter (with 30, 30,15 and 12 items) and translated into several languages versions have also been developed^{45,46,47,48}. Study performed by Batigün et al. aimed to develop self-report Cyberchondria Scale (CS). Evaluating cognitive, emotional and behavioural tendency to cyberchondria was measured by additional tools (Internet Addiction Scale, Brief Symptom Inventory and Health Anxiety Inventory). Combined questionnaire had five-factor structure

⁴¹ R. W. White, E. Horvitz, *Cyberchondria: Studies of the escalation ...*, pp. 1–37, *Op. cit.*

⁴² B. M. Mathes, A. M. Norr, A. M. Norr A.M., N. P. Allan, et al., *Cyberchondria: Overlap with health anxiety and unique relations with impairment, quality of life, and service utilization*, "Psychiatry Research", 2018, No. 261, pp. 204-211.

⁴³ V. Starcevic, D. Berle, S. Arnáez, *Recent Insights Into Cyberchondria*, "Current Psychiatry Reports", 2020, No. 22(11), p. 56.

⁴⁴ E. McElroy, M. Shevlin, *The development and initial validation of the cyberchondria severity scale (CSS)*, "Journal of Anxiety Disorders", 2014, No. 28(2), pp. 259–265.

⁴⁵ A. Barke, G. Bleichhardt, G., W. Rief, B. K. Doering, *The Cyberchondria Severity Scale (CSS): German Validation and Development of a Short Form*, "International Journal of Behavioral Medicine", 2016, No. 23, pp. 595–605.

⁴⁶ V. Starcevic, S. Baggio, D. Berle D., Y. Khazaal Y, et al., *Cyberchondria and its Relationships with Related Constructs: a Network Analysis*, "Psychiatric Quarterly", 2001, No. 90(3), pp.491-505.

⁴⁷ A. M. Norr, N. P. Allan, J. W. Boffa, A. M. Raines, et al., *Validation of the Cyberchondria Severity Scale (CSS): replication and extension with bifactor modeling*, "Journal of Anxiety Disorders", 2015, No.31, pp.58-64.

⁴⁸ C. Marino, T. A. Fergus, A. Vieno, G. Bottesi, et al., *Testing the Italian version of the Cyberchondria Severity Scale and a metacognitive model of cyberchondria*, "Clinical Psychology & Psychotherapy", 2020, No.27(4), pp. 581-596.

including: increasing/decreasing anxiety factors, dysfunctional Internet use, compulsion/hypochondria and doctor-patient interaction⁴⁹. Polish (16 items) adaptation of the CSS was carried out by Bajcar et al. who established a four factor structure of the scale. Their study confirmed the association of cyberchondria with health anxiety and features of obsessive-compulsive disorder. They proposed also that further research should be focused on establishing a causal connection between health anxiety and online health research in cyberchondria⁵⁰. Different study was an attempt to develop a tool for measuring tendencies to cyberchondria and to describe its factor structure. Focus of Cyberchondria Tendency Scale was to determine whether web users regard the Internet as a basic source of health-related information and how much they do rely on it (measuring tendency to apply online medical suggestions). Obtained results did not support multidimensional assessment of cyberchondria but highlighted that cyberchondria tendency can negatively impact doctors-patients relations and can be related to higher level of trust to online health-related sources of information⁵¹.

4. Protective potential of health literacies

The review published by Berkman et al. showed that a sufficient level of health literacy (HL) is a prerequisite for the patients' wellbeing and healthy lifestyle, their effective communication with healthcare providers, and in consequence an effective use of healthcare resources⁵². Modern health policy should therefore not only focus on the provision of high-quality health information, but also on the development of adequate HL in the society⁵³.

The World Health Organisation (WHO) defines HL as “the cognitive and social skills which determine the motivation and ability of individuals to gain access, understand and use information in ways which promote and maintain good health”⁵⁴. On the hand, according to WHO e-health system development should rely on “cost-effective and secure use of

⁴⁹ A. D. Batıgün, N. Gor, B. K. Akik, I. S. Ertürk, *Cyberchondria Scale (CS): Development, validity and reliability study*, A. Dusunen (ed.), “The Journal of Psychiatry and Neurological Sciences”, 2018, 31(10) pp.148-162.

⁵⁰ B. Bajcar, J. Babiak, A. Olchowska-Kotala, *Cyberchondria and its measurement. The Polish adaptation and psychometric properties of the Cyberchondria Severity Scale CSS-PL*, “Psychiatria Polska”, 2019, No. 53(1), pp. 49–60.

⁵¹ Z. Tatlı, Ö. Tatlı, M. Kokoç, *Development and validity of cyberchondria tendency scale*, “World Journal on Educational Technology”, 2019, No. 11(1), pp. 1-9.

⁵² N. D. Berkman, S. L. Sheridan, K. E. Donahue, D. J. Halpern, et al., *Low health literacy and health outcomes: An updated systematic review*, “Annals of Internal Medicine”, 2011, No.155, pp. 97–107.

⁵³ K. Sørensen, S. Van den Broucke, J. M. Pelikan, J. Fullam, et al., *Measuring health literacy in populations: Illuminating the design and development process of the European Health Literacy Survey Questionnaire (HLS-EU-Q)*, “BMC Public Health”, 2013, No. 13, p. 948.

⁵⁴ D. Nutbeam, *Health Promotion Glossary*, “Health Promotion International”, 1998, No. 13, pp. 349–364.

information”⁵⁵. In the statement from 58th World Health Assembly, e-health was treated as a strategy to make health systems more efficient and responsive to people's needs and to reach communities, vulnerable groups and organizations from different fields⁵⁶. According to Eysenbach, the growth of e-health domain stems not only from the involvement of healthcare professionals, but also from the engagement of professionals creating, analysing, implementing, and maintaining high-tech medical services and systems⁵⁷.

With the growth of e-health environment, a complex and highly processed health information (created both by medical scientists and marketing specialist) becomes a product targeted to concrete groups of recipients. Therefore, patients need high awareness and skills to anticipate senders' intentions and to find needed information⁵⁸. Norman & Skinner postulated that there is a need for developing e-health literacy (eHL), which includes such skills as searching, accessing, understanding and evaluating health-related information from electronic sources and the ability to transfer it to the knowledge useful for addressing or solving a particular health problem⁵⁹. During the COVID-19 pandemic, many authors emphasised the importance of HL and eHL in preventing misinformation and decreasing its harmful effects like fear and anxiety^{60,61}.

Interestingly, some authors reported that HL but no eHL may be associated with the future anxiety⁶². Furthermore, a higher level of HL could exert a small, protective effect against conspiracy beliefs. Paradoxically, higher eHL and younger age were associated with higher propensity to such beliefs⁶³. Such findings may be particularly disturbing, taking into consideration the fact, that younger generations are the primary users of the information

⁵⁵ The WHO 58th World Health Assembly Resolutions and Decisions. WHA58.28 eHealth. , https://apps.who.int/iris/bitstream/handle/10665/20378/WHA58_28-en.pdf [viewed: 04.02.2021], p. 121

⁵⁶ Ibidem, pp. 121-122.

⁵⁷ G. Eysenbach, *What is e-health?*, “Journal of Medical Internet Research”, 2001, No. 3(2) e.20.

⁵⁸ C. D Norman, H. A. Skinner, *eHealth Literacy: Essential Skills for Consumer Health in a Networked World*, “Journal of Medical Internet Research”, 2006, No. 16;8(2), p. 9.

⁵⁹ C.D. Norman, S. Chirrey, H. A. Skinner, *Consumer perspectives on e-Health*, [in:]: H.A. Skinner (ed.), *Promoting Health through Organizational Change*, CA: Benjamin Cummings, San Francisco, 2002, pp. 315-334.

⁶⁰ S. Van den Broucke, *Why health promotion matters to the COVID-19 pandemic, and vice versa*, “Health, Promotion International”, 2020, No. 35, pp. 181-186.

⁶¹ E. K. Vraga, M. Tully, L. Bode, *Empowering Users to Respond to Misinformation about Covid-19*, “Media and Communication”, 2020, No. 8(2), pp. 475–479.

⁶² M. Duplaga, M. Grysztar, *The Association between Future Anxiety, Health Literacy and the Perception of the COVID-19 Pandemic: A Cross-Sectional Study*, “Healthcare”, 2021 , No. 9(1), p.43.

⁶³ M. Duplaga, *The Determinants of Conspiracy Beliefs Related to the COVID-19 Pandemic in a Nationally Representative Sample of Internet Users*, “International Journal of Environmental Research and Public Health”, 2020, No. 17(2):7818.

provided on Internet including health-related information⁶⁴. This may suggest that not only ability to access and use health information is important in process of distributing medical knowledge to the public. Those patients who will achieve desired level of eHL can be more critical towards scientific world and eager find out about different points of view (potentially also conspiracy theorists). White & Horvitz suggest that online content providers should be aware of their potential to increase medical anxiety. Therefore, they should observe and regularly study the implications of provided content to particular groups⁶⁵. In ideal situation, the outcomes of such assessment should enables tracing the changes in patients' health experiences over time.

There are not many studies assessing the relationship between HL, eHL and cyberchondria. According to Zheng et al. eHL helps users to reduce affective responses related with browsing health information and other cyberchondria symptoms like escalation of health anxiety. People with sufficient capacity to collect and process online health-related information are aware that the Internet is just a tool presenting possible results regarding their query, not scientifically proven and objective diagnose⁶⁶. Vâjâean & Băban performer a study that that eHL may act as a preventive factor against distress associated with searching for health information online, particularly for those with lower internal health locus of control⁶⁷. It seems that the role of HL and eHL as potential protecting factors against cyberchondria requires further research.

Summary

The possibility of accessing immense resources of health-related information on the Internet may results in positive and negative effects. From one side, patients became empowered in their interactions with healthcare and health professionals through improved competencies and understanding of medical problems. On the other hand, lay people become exposed to medical fake news and other forms of disinformation that can be easily spread online. Cyberchondria is also related to abusive use of health-related information online. Apart from complex psychological background, it is also associated with the lack of professional

⁶⁴ E. Maigret, *Internet i nowe technologie informacji*, [in:] E. Maigret, *Socjologia komunikacji i mediów*, 2008, p. 424.

⁶⁵ R.W. White, E. Horvitz, *Cyberchondria: Studies of the escalation ...*, pp. 1–37, *Op cit.*

⁶⁶ H. Zheng, X. Chen, S. Fu, *An exploration of determinants of cyberchondria: A moderated mediation analysis. Proceedings of the Association for Information, "Science and Technology"*, 2020, No. 57(1), p. 214.

⁶⁷ C.Vâjâean, A. Băban, *Emotional and behavioural consequences of online health information-seeking: The role of eHealth Literacy*, "Cognitie, Creier, Comportament/Cognition, Brain, Behavior", 2015, No. 19(4), pp. 327-345.

background to critically assess information distributed on the Internet. Many authors postulates that increased skills and knowledge, substantiated by health and e-health literacy, may have a protective effect against negative conditions arising from the use of Internet resources. However, the role of both literacies has not been sufficiently explored.

References

- [1] Abraham J., *The sociological concomitants of the pharmaceutical industry and medications*. [in:] *Handbook of medical sociology*, Bird C.E., Conrad P., Fremont A.M., Timmermans S. (ed.) Vanderbilt, "University Press", Nashville, 2010, pp. 590–610. ISBN13: 9780826517203.
- [2] Bajcar B., Babiak J., Olchowska-Kotala A., *Cyberchondria and its measurement. The Polish adaptation and psychometric properties of the Cyberchondria Severity Scale CSS-PL*, "Psychiatria Polska", 2019, No. 53(1), pp. 49–60 DOI: <https://doi.org/10.12740/PP/81799>.
- [3] Barke A., Bleichhardt G., Rief W., Doering B. K., *The Cyberchondria Severity Scale (CSS): German Validation and Development of a Short Form*, "International Journal of Behavioral Medicine", 2016, No. 23, pp. 595–605. DOI: 10.1007/s12529-016-9549-8.
- [4] Baumgartner S. E., Hartmann T., *The role of health anxiety in online health information search*, "Behaviour, and Social Networking", 2011, No. 14(10), pp. 613–618. DOI: 10.1089/cyber.2010.0425.
- [5] Berkman N.D., Sheridan S.L., Donahue K.E., Halpern D.J., Crotty K., *Low health literacy and health outcomes: An updated systematic review*, "Annals of Internal Medicine", 2011, No.155, pp. 97–107. DOI: 10.7326/0003-4819-155-2-201107190-00005.
- [6] Batıgün A. D., Gor N., Akik B. K., Ertürk I. S., *Cyberchondria Scale (CS): Development, validity and reliability study*, A. Dusunen (ed.) "The Journal of Psychiatry and Neurological Sciences", 2018, 31(10), pp.148-162. DOI: 10.5350/DAJPN2018310203.
- [7] Bujnowska-Fedak M. M., Waligóra J., Mastalerz-Migas A., *The Internet as a Source of Health Information and Services* [in]: M. Pokorski (ed.), *Advancements and Innovations in Health Sciences*, "Springer International Publishing", 2019, pp. 1–16. DOI: 10.1007/5584_2019_396.
- [8] Cline R. J., Haynes K. M., *Consumer health information seeking on the Internet: the state of the art*, "Health Education Research", 2001, No.16(6), pp. 671 – 692. DOI: 10.1093/her/16.6.671.
- [9] Conrad P., *Medicalization and Social Control*, "Annual Review of Sociology", 1992, No.18, p. 221. DOI: 10.1146/annurev.so.18.080192.001233.
- [10] Doherty-Torstrick E. R., Walton K.E., Fallon B.A., *Cyberchondria: Parsing Health Anxiety From Online Behavior*, "Psychosomatics", 2016, No. 57(4), pp. 390–400. DOI: 10.1016/j.psych.2016.02.002.
- [11] Duplaga M., *The Determinants of Conspiracy Beliefs Related to the COVID-19 Pandemic in a Nationally Representative Sample of Internet Users*, "International Journal of Environmental Research and Public Health", 2020, No. 17(21). DOI: 10.3390/ijerph17217818.

- [12] Duplaga M., Grysztar M., *The Association between Future Anxiety, Health Literacy and the Perception of the COVID-19 Pandemic: A Cross-Sectional Study*. "Healthcare", 2021, No. 9(1), p.43. DOI: 10.3390/healthcare9010043.
- [13] Eysenbach G., *What is e-health?*, "Journal of Medical Internet Research", 2001, No. 3(2):e20, DOI:10.2196/jmir.3.2.e20.
- [14] Eysenbach G., Powell J., Kuss O., Sa E.R., *Empirical studies assessing the quality of health information for consumers on the World Wide Web a systematic review*, JAMA, 2002, No. 287, pp. 2691-2700. DOI: 10.1001/jama.287.20.2691.
- [15] Fergus T. A., *Anxiety sensitivity and intolerance of uncertainty as potential risk factors for cyberchondria: A replication and extension examining dimensions of each construct*, "Journal of Affective Disorders", 2015, No. 184, pp. 305–309. DOI: 10.1016/j.jad.2015.06.017.
- [16] Fergus T. A., Russell L.H., *Does cyberchondria overlap with health anxiety and obsessive-compulsive symptoms? An examination of latent structure and scale interrelation*, "Journal of Anxiety Disorders", 2016, No. 38, pp. 88–94. DOI: 10.1016/j.janxdis.2016.01.009.
- [17] Hart J., Björgvinsson T., *Health anxiety and hypochondriasis: Description and treatment issues highlighted through a case illustration*, "Bulletin of the Menninger Clinic", 2010, No. 74(2), pp. 122-140. DOI: 10.1521/bumc.2010.74.2.122.
- [18] Jaskiernia A., *Publiczne media elektroniczne w Europie*, ASPRA-JR, Warszawa, 2006, pp. 32–33.
- [19] Kivits J., *Everyday health and the internet: A mediated health perspective on health information seeking*, "Sociology of Health & Illness", 2009, No.31(5), pp. 673–687. DOI: 10.1111/j.1467-9566.2008.01153.x.
- [20] Kordzadeh N., Warren J., *Toward a typology of health 2.0 collaboration platforms and websites*, "Health and Technology", 2013, No. 3(1), pp. 37-50. DOI: 10.1007/s12553-013-0043-x.
- [21] Lemire M., Sicotte C., Paré G., *Internet use and the logics of personal empowerment in health*, "Health Policy", 2008, No.88(1), pp. 130–140. DOI: 10.1016/j.healthpol.2008.03.006.
- [22] Light D., Lexchin J., Darrow J.J., *Institutional corruption of pharmaceuticals and the myth of safe and effective drugs*, "The Journal of Law, Medicine & Ethics", 2013, No. 14(3), pp. 590–610. DOI: 10.1111/jlme.12068.
- [23] Leykin Y., Muñoz R.F., Contreras O., *Are consumers of Internet health information "cyberchondriacs"? Characteristics of 24,965 users of a depression screening site*, "Depression and Anxiety", 2012, No. 29(1), pp. 71–77. DOI: 10.1002/da.20848.
- [24] Norr A. M., Allan N. P., Boffa J.W., Raines A. M., Schmidt N. B., *Validation of the Cyberchondria Severity Scale (CSS): replication and extension with bifactor modelling*, "Journal of Anxiety Disorders", 2015, No.31, , pp.58-64. DOI: 10.1016/j.janxdis.2015.02.001.
- [25] Norr A. M., Oglesby M.E., Raines A.M., Macatee R.J., Allan N.P., Schmidt N.B., *Relationships between cyberchondria and obsessive-compulsive symptoms*, "Psychiatry Research", 2018, No. 261, pp. 441–446. DOI: 10.1016/j.psychres.2018.01.002.
- [26] Norman C.D., Chirrey S., Skinner H.A., *Consumer perspectives on e-Health*, [in:]: H.A. Skinner (ed.), *Promoting Health through Organizational Change*, CA: Benjamin Cummings, San Francisco, 2002, pp. 315-334. DOI: 10.2196/jmir.8.2.e9.

- [27] Norman C. D., Skinner H. A., *eHealth Literacy: Essential Skills for Consumer Health in a Networked World*, "Journal of Medical Internet Research", 2006, No. 16;8(2), p. 9. DOI: 10.2196/jmir.8.2.e9.
- [28] Makowska M., Nowakowski M., *Socjologia farmaceutyków jako "subpole" socjologii medycyny*, „Przegląd Socjologiczny”, 2018, No. 67(4), pp. 97-115. DOI: /10.26485/PS/2018/67.4/5.
- [29] Maigret E., *Internet i nowe technologie informacji*, [in:] E. Maigret, *Socjologia komunikacji i mediów*, Wydawnictwo: Oficyna Naukowa, Warszawa 2008, p. 424.
- [30] Marino C., Fergus T. A., Vieno A., Bottesi G., Ghisi M., Spada M. M., *Testing the Italian version of the Cyberchondria Severity Scale and a metacognitive model of cyberchondria*, Clin "Clinical Psychology & Psychotherapy", 2020, No.27(4), pp. 581-596. DOI: 10.1002/cpp.2444.
- [31] Mathes B.M., Norr A.M., Allan N.P., Albanese B.J., Schmidt N.B., *Cyberchondria: Overlap with health anxiety and unique relations with impairment, quality of life, and service utilization*, "Psychiatry Research", 2018, No. 261, pp. 204-211. DOI: 10.1016/j.psychres.2018.01.002.
- [32] McElroy E., Shevlin M., *The development and initial validation of the cyberchondria severity scale (CSS)*, "Journal of Anxiety Disorders", 2014, No. 28(2), pp. 259–265. DOI: 10.1016/j.janxdis.2013.12.007.
- [33] McMullan M., *Patients using the Internet to obtain health information: how this affects the patient –health professional relationship*, "Patient Education and Counselling", 2006, No.63(1), pp. 24 –85. DOI: 10.1016/j.pec.2005.10.006.
- [34] McMullan R. D., Berle D., Arnáez S., Starcevic V. J., *The relationships between health anxiety, online health information seeking, and cyberchondria: Systematic review and meta-analysis*, "Journal of Affective Disorders", 2019, No. 15(245), pp. 270-278. DOI: 10.1016/j.jad.2018.11.037.
- [35] Miah A., Rich E., *The Medicalization of Cyberspace*, Routledge, 2008, pp.1-21. ISBN 9780415393645.
- [36] Muse K., McManus F., Leung C., Meghreblian B., Williams J.M., *Cyberchondriasis: Fact or fiction? A preliminary examination of the relationship between health anxiety and searching for health information on the Internet*, "Journal of Anxiety Disorders", 2012, No. 26(1), pp. 189–196. DOI: 10.1016/j.janxdis.2011.11.005.
- [37] Nutbeam D., *Health Promotion Glossary*, "Health Promotion International", 1998, No. 13 pp. 349–364. DOI: 10.1093/heapro/13.4.349.
- [38] Orłowski J. P., Wateska L., *The effects of pharmaceutical firm enticements on physician prescribing patterns. there's no such thing as a free lunch*, "Chest", 1992, No. 102(1), pp. 270–273. DOI: 10.1378/chest.102.1.270.
- [39] Piątkowski W., *Zdrowie, choroba, społeczeństwo. Studia z socjologii medycyny*, DGM Informationsgesellschaft, Lublin 2004, pp. 1-31.
- [40] Polak P., *Nowe formy korupcji. Analiza socjologiczna sektora farmaceutycznego w Polsce*, Nomos, Kraków 2011, pp. 1–37.
- [41] Siuda P., Pluta M., *Doświadczenie zdrowia i choroby w dobie Internetu*, (in:) J. Burczyk (ed.) *Internet, zdrowie i choroba- powiązania społeczne, kulturowe i edukacyjne*, Wydawnictwo Uniwersytetu Kazimierza Wielkiego, Bydgoszcz 2020, pp. 1-14.
- [42] Sokołowska M., *Granice medycyny*, Warszawa 1980, pp.125-126.
- [43] Sørensen K., Van den Broucke S., Pelikan J.M., Fullam J., Doyle G., Slonska Z., Kondili B., Stoffels V., Osborne R.H., Brand H., *Measuring health literacy in*

- populations: *Illuminating the design and development process of the European Health Literacy Survey Questionnaire (HLS-EU-Q)*, “BMC Public Health”, 2013, No. 13, p. 948. DOI: 10.1186/1471-2458-13-948.
- [44] Starcevic V., Berle D., Arnáez S., *Recent Insights Into Cyberchondria*, “Current Psychiatry Reports”, 2020, No. 22(11), p. 56. DOI: 10.1016/j.psychres.2018.01.002.
- [45] Starcevic V., Baggio S., Berle D., Khazaal Y., Viswasam K., *Cyberchondria and its Relationships with Related Constructs: a Network Analysis*, “Psychiatric Quarterly”, 2001, No. 90(3), pp. 491-505. DOI: 10.1007/s12529-016-9549-8.
- [46] Starcevic V., Berle D., *Cyberchondria: towards a better understanding of excessive health-related Internet use*, “Expert Review of Neurotherapeutics”, 2013, No13(2), pp. 205-213. DOI: 10.1586/ern.12.162.
- [47] Sunita S., Fugh-Berman A., *Physicians under the influence: Social psychology and industry marketing strategies*, “The Journal of Law, Medicine & Ethic”, 2013, 41(3), pp. 665–672. DOI: 10.1111/jlme.12076.
- [48] Tatlı Z., Tatlı Ö., Kokoç M., *Development and validity of cyberchondria tendency scale*, “World Journal on Educational Technology”, 2019, No. 11(1), pp. 1-9. DOI:10.12740/PP/81799.
- [49] Tversky A., Kahneman D., *Judgment under uncertainty: Heuristics and biases*, “Science”, 1974, No 185(4157), pp. 1124–1131. DOI: 10.1126/science.185.4157.1124.
- [50] Tyrer P., Cooper S., Tyrer H., Wang D., Bassett P., *Increase in the prevalence of health anxiety in medical clinics: Possible cyberchondria*, “International Journal of Social Psychiatry”, 2019, No. 65(7-8), pp. 566-569. DOI: 10.1177/0020764019866231.
- [51] Ulatowska-Szostak E., Marcinkowski J.T., Gromadecka-Sutkiewicz M., Krzywińska-Wiewiórowska M., Stawińska-Witoszyńska B., *The research of Internet as the source of information about a disease*, “Problemy Higieny i Epidemiologii”, 2009, No. 90(2), pp. 246-253 <http://www.phie.pl/pdf/phe-2009/phe-2009-2-246.pdf> [viewed: 15.02.2021].
- [52] Uramowska-Żyto B., *Zdrowie i choroba w świetle wybranych teorii socjologicznych*, wyd. iFiS PAN, Warszawa 1992, p. 6.
- [53] Van den Broucke S., *Why health promotion matters to the COVID-19 pandemic, and vice versa*, “Health, Promotion International”, 2020, No. 35. DOI: 10.1093/heapro/daaa042.
- [54] Vâjâean C., Băban A., *Emotional and behavioural consequences of online health information-seeking: The role of eHealth Literacy*, “Cognitie, Creier, Comportament/Cognition, Brain, Behavior”, 2015, No. 19(4) . DOI: 10.3233/978-1-61499-830-3-122.
- [55] Vraga E. K., Tully M., Bode L., *Empowering Users to Respond to Misinformation about Covid-19*, “Media and Communication”, 2020, No. 8(2), pp. 475–479. DOI: 10.1093/heapro/daaa042.
- [56] White R., Horvitz E., *Cyberchondria: Studies of the escalation of medical concerns in Web search*, “Transactions on Information Systems”, 2009, No. 27(4), pp.1-37. DOI: 10.1145/1629096.1629101.
- [57] White R. W., Horvitz E., *Experiences with web search on medical concerns and self diagnosis*, AMIA Annual Symposium Proceedings, 2009, pp. 696–700. PMID: PMC2815378.
- [58] White R.W., Horvitz E., *Predicting escalations of medical queries based on web page structure and content*, Proc ACM SIGIR Conference on Research and

- Development in Information Retrieval, 2010, p. 769. DOI: 10.1145/1835449.1835607.
- [59] Zheng H., Chen X., S. Fu, *An exploration of determinants of cyberchondria: A moderated mediation analysis. Proceedings of the Association for Information Science and Technology*, 2020, No. 57(1), p. 214. DOI: 10.1002/pra2.214.
- [60] The WHO Fifty-eighth World Health Assembly, pp. 121-122. https://apps.who.int/iris/bitstream/handle/10665/20378/WHA58_28-en.pdf [viewed: 15.02.21].

Abstract

Cyberchondria is defined as abnormal behaviour characterised by uncontrolled accessing health-related information available online resulting in distress and anxiety. People suffering from cyberchondria escalate their fear about possible severe medical consequences even in the presence of mild symptoms. Further, they fall into a vicious circle of anxiety and repeated search activities on the Internet in order to self-diagnose their medical conditions. The dimensions of cyberchondria in the society are not fully understood. The use of health-related information available online may have positive effect on health awareness and the ability of efficient use of healthcare resources. It is not clear what are the preconditions driving Internet users to cyberchondria instead of rationale use. Although, the concept of health and e health literacy are known at least from about 20 years, their role in the development of cyberchondria has not been studied thoroughly. There are expectations that they could exert a protective effect, but this needs to be confirmed.

Keywords

cyberchondria, health-related online information, health literacy, e-health literacy