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Personality Traits of Future Nurses and Cyberchondria: Findings from an Emerging Economy

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Abstract: The Internet is intricately embedded in our everyday lives and has become a valuable source of information to support learning due to its accessibility and decreasing costs. However, the rising costs of healthcare resulted in students seeking medical information from online health websites contributing unnecessary stress to their academic lives. In developing economies, however, the overloaded information from the Internet brings forth severe risks to these individuals by exposing themselves to inaccurate and inappropriate information in addressing their perceived conditions and symptoms. Cyberchondria is the speculative escalation of anxieties about common health issues which is grounded on the assessment of online information to satisfy medical curiosity. The personality traits of nursing students in higher education are utilized to identify which among these traits can lead to cyberchondria by examining 207 responses through a structural equation model technique. Analysis of data reveals that the individual personality traits of conscientiousness and neuroticism are positively associated with cyberchondria. Practical and academic implications are discussed in relation to the role of technology in nursing education.

Keywords: Nursing education, online health information, individual personality traits, structural equation model, cyberchondria

1. Introduction

The profession of nursing is vital to sustain national healthcare systems and educational institutions play a pivotal role in molding the nurses of tomorrow. In the Philippines, the nursing profession remains to be one of the top skilled migration exports and is one of the top choices of students in their pursuit of higher education qualifications (Castro-Palaganas et al., 2017). Recent reforms in the Philippine ICT and healthcare sectors created a multitude of opportunities for Filipinos to conveniently access online information making them more knowledgeable on their health-related issues (Camus, 2018; Ranada, 2019). In addition, the availability of vast medical information online resulted in people spending countless hours searching for possible diagnosis of their symptoms. For example, a Pew Research (2013) study revealed that 35% of individuals in Northern America are taking advantage of the availability of health information on the Internet prompting them to self-diagnose their conditions using the popular online health websites of WebMD, Mayo Clinic and Health Line. The abundance of health information on the Internet has allowed people to explore and research about their health from the comfort of their homes. Although the use of online information will enable making informed decisions, it has the possibility of intensifying the anxiety in people who have no background in health and medical training when employed as a diagnostic practice.

Prior studies argue that the self-diagnosis behavior of individuals invites unnecessary psychological stress, largely attributed to possible exaggeration of fears about their health conditions. The proliferation of medical information online increases the risk of acquiring information that are misleading, unreliable, and susceptible to misinterpretation (Gass, 2016). This phenomenon, as coined

by White and Horvitz (2002), is known in cyberpsychology as cyberchondria which is the repetitive utilization of Internet resources for information on the individual's health leading to heightened paranoia. Cyberchondria is a relatively emerging issue, but with the advancement of high-speed internet and mobile phones, it has become a public health issue in developing economies (Inthiran, 2016). Susceptibility to cyberchondria varies and a prior study established a linkage between increased availability of information on the Internet as well as the influence of individual personality attributes (Baumgartner et al. 2011).

In higher education, students are faced with meeting their academic requirements in addition to varied personal issues of adolescent life such as health. As such, the Internet has become a constant resource in trying to address these health issues which may heighten cyberchondria (Bati, Mandiracioglu, Govsa, & Çam, 2018). As nurses are important stakeholders in the healthcare system, a more profound understanding of the relationship between individual characteristics and escalations of Internet anxiety among nursing students will be beneficial to higher educational institutions and regulatory bodies, to enable the production of the next generation of nurses. In this study, the authors propose to examine the relationship between cyberchondria and the Big Five individual personality traits in the context of nursing students from higher education in a developing economy.

2. Related Literature

The proliferation of online websites providing health-related information is driven by the desire of individuals to have an initial understanding of their health concerns. However, numerous studies suggested that excessive exposure and interaction with online medical content may intensify anxiety (White & Horvitz, 2012). The anxiety induced by these health-related searches online may lead to uncontrolled risky behavior leading to cyberchondria (Aiken & Kirwan, 2012). The study of Baumgartner & Hartmann (2011) explored the relationship between health anxiety and online search behavior, which revealed that anxious individuals experience negative consequences from the use of the Internet for searching health information. In another study, the information-seeking behavior of an individual can be attributed to the factors of individual personality traits (Halder et al. 2010). As a result, individual characteristics play a crucial role in determining the anxiety behavior of individuals toward Internet use for online health searches. In higher education, access to the Internet appears to have a positive relationship with cyberchondria. The study by Bati et al. (2018), revealed that frequent Internet search on health-related issues increase cyberchondria and that this effect is heightened in those who are suffering medical conditions. The findings of this study are aligned with a prior investigation by Singh & Brown (2014) which revealed that university students tend to utilize the Internet in searching for related information on their health issues.

The theory of personality traits has been used in many Information Systems (IS) and Information Technology (IT) researches to understand the influence of individual behaviors in different technological and societal contexts (Maier, 2012). The Theory of Personality Traits describes an individual's traits as a set of "*dispositions leading to constant patterns of thoughts, feelings, and behaviors across diverse situations that distinguish individuals from each other*" (Costa & McCrae, 2006, p.3). These stable elements of an individual's personality include extraversion, neuroticism, openness to experience, agreeableness, and conscientiousness (Costa & McCrae, 2001). Krishnan et al. (2010) examined the influence of personality traits on cyberloafing to describe the intended acts of employees in using their organizations' Internet resources during working hours for personal purposes. In the study of Maier et al., (2017), the individual perception of technology use and how it adds to stress is influenced by personality. Also, other studies revealed that different personality traits could be a predictor of individual unethical behavior with Internet addiction and cyberplagiarism (Ramírez-Correa, 2017; Ayar et al. 2015). The study of Karabeliova & Ivanova (2014) explored the linkages between cyberchondria, Internet addiction, and individual personality traits and results show that high levels of neuroticism influences health anxiety and a low level of conscientiousness predicts Internet addiction. For this study, the five personality traits of nursing students and their relationships to cyberchondria are operationalized in five hypotheses as shown in Figure 1 – Theoretical Framework

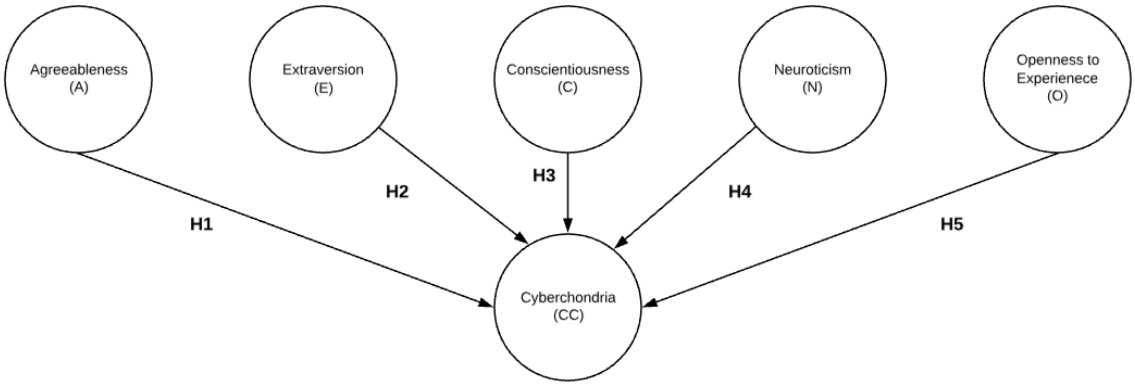

Figure 4. Theoretical Framework

3. Methodology

The study used a cross-sectional method to investigate the relationship between individual personality traits and cyberchondria using an online survey. Students enrolled in the Bachelor of Science in Nursing program from two Philippine universities were invited to participate in an online survey. The rationale behind the research, sections of the instrument and privacy protocols were explicitly stated at the start of the survey process. The authors ensured that ethical standards are upheld through informed consent from students who are at least 18 years old. A total of 207 responses were recorded and analyzed for construct validation and hypothesis testing. The demographic profile of the respondents revealed that most of them are active online consumers of health information. Majority of the respondents are female nursing students, accounting for 65% or 134 of those who participated in the study. The rest are male nursing students with a total of 73 or 35% of the total recorded responses.

A concise version of the International Personality Item Pool (IPIP) survey instrument from Donnellan, Oswald, Baird and Lucas (2006) was used for this study to measure the individual's personality traits. On the other hand, the questions concerning cyberchondria were taken from Selvi et al. (2017). The final version of the instrument consists of 33 items about the individual's perceptions on the Internet's health information, their practices with the use of the Internet to search for health-related information, and how the Internet influences their health concerns. Participants answered using a five-point Likert scale ranging from 1 – "Never" to 5 - "Always". Some items were modified to ensure its appropriateness to the context of the study. Indicators that failed to meet the minimum threshold for Cronbach Alpha (0.70), Composite Reliability (0.70) and Average Variance Extracted (0.50) were discarded resulting in a final version of the questionnaire.

4. Results and Discussion

Validity of the research model was tested by performing a multiple regression analysis using a Structural Equation Model as proposed by Hair et. al. (2014). This technique was used in another study investigating personality traits and its relationship with deviant behavior (Ramírez-Correa, 2017). The data was analyzed using SmartPLS 3.0 and the results are shown in Table 1 - Results.

Table 1
Results

Hypothesis	Statement	T-Statistics	Decision
H1	A high level of agreeableness is positively related to cyberchondria	1.470	Reject
H2	A high level of conscientiousness is positively related to cyberchondria	2.197	Accept
H3	A high level of extraversion is positively related to cyberchondria	0.978	Reject
H4	A high level of neuroticism is positively related to cyberchondria	2.786	Accept
H5	A high level of openness to experience is positively related to cyberchondria	0.895	Reject

Based on T-statistics, high levels of conscientiousness and neuroticism are positively related to cyberchondria. The values of 2.197 (conscientiousness) and 2.786 (neuroticism) are above the acceptable values of 1.96 resulting to a positive relationship to cyberchondria. Although the values of 1.470 (agreeableness), 0.978 (extraversion) and 0.895 (openness) demonstrate positive relationship towards cyberchondria, their relationships cannot be supported in the context of this investigation (Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, 2014).

Based on the results, the authors infer that neuroticism and conscientiousness have a considerable impact on the escalation of individual health anxiety through a consistent Internet search for health information. On the contrary, the traits of extraversion, agreeableness, and openness do not positively influence cyberchondria. As revealed in the study of Karabeliova and Ivanova (2014), increased levels of neuroticism and conscientiousness of an individual can be positively associated with cyberchondria. Conscientiousness is associated with being reliable, responsible, organized, and hardworking (Goldberg, 1990). As such, people who have this trait exhibit a consistent desire for success through purposeful planning and persistence. These people can be compulsive perfectionists with a tendency to hoard vast amounts of online information to guide their decision making (Ozowa, 2017). On the other hand, people with high levels of neuroticism are anxious, depressed, embarrassed, emotional, angry, worried and insecure (Costa & McCrae, 2001). In education, students demonstrating neurotic tendencies are at high risk to commit academic dishonesty or other deviant behaviors (Ramírez-Correa, 2017).

To mitigate the negative impact of cyberchondria on public health, the authors highlight several recommendations. The study of White & Horvitz (2012) provided a framework for search engines to monitor the long-term search behavior of individuals by analyzing Internet search logs, to offer better support and prevent escalation of unethical online behavior. A predictive model was proposed to accurately predict when concerns are expected to escalate and the assessment of these impacts for any individual suffering from anxiety behavior. In another study, Starcevic (2017) argued for the reinforcement of online health information literacy in educational institutions by identifying the limitations of Internet usage, recognizing the credibility of various medical websites and assessing online health searches critically.

5. Conclusion, Limitations and Recommendations

While this study attempts to identify the relationship of personality traits to cyberchondria, the findings are limited by the number of respondents and the sampling technique used by the researchers. The limitations of the study created opportunities for future research. First, there is a need to enrich the collection of data to cover the equal representation of the overall locality in the Philippines. Therefore, the authors recommend replication of the study with larger samples to better demonstrate the relationship between cyberchondria and other personality traits. Second, a thorough study of the different age groups will capture various factors with regard to Internet user behavior and cyberchondria. Lastly, to complement and further improve the general lack of adequate survey methods that allow researchers to make strong and reliable inferences, future research should apply other methodologies such as qualitative interviews, content analysis or other emerging techniques to discover the most commonly recurring types of individual online behaviors in relation to their health issues.

In conclusion, this study identified which among the personality traits of nursing students as proposed by Goldberg (1990) are susceptible to cyberchondria. The structural model indicated that a high level of conscientiousness and neuroticism has a positive relationship to cyberchondria at a significant level. This result is consistent with the findings of Heiman, et al., (2018) in Germany, which revealed that individuals with a higher score for conscientiousness and neuroticism are likely to seek information about the illness on the Internet. Several recommendations can be inferred from the findings of this study. First, as future medical professionals, nursing students have the moral obligation to develop critical appraisal skills to identify which information is valid and reliable (O'Mathúna, 2018). These skills will be valuable as they will be interacting with patients in the future who may have a prior diagnosis of their health conditions from Internet sources. Second, while the Internet is an important tool in supporting education, universities should incorporate curricular adjustments to inculcate the value of accurate and reliable Internet information to mitigate cyberchondria among university students. Such interventions will enable nursing students to cope with the challenges of their academic lives and prepare them for their future roles in the healthcare industry (Bati et al., 2018). This can be accomplished by integrating cyberchondria in ethics or technology courses specifically designed for

medical students. Lastly, Internet stakeholders need to collaborate to ensure that medical information available are those that are scientifically proven to alleviate the negative effects of cyberchondria to its users (O'Mathúna, 2018).

References:

Aiken, M., & Kirwan, G. (2012). Prognoses for diagnoses: medical search online and "cyberchondria." *BMC Proceedings*, *6*(Suppl 4), P30. https://doi.org/10.1186/1753-6561-6-S4-P30

Bati, A. H., Mandiracioglu, A., Govsa, F., & Çam, O. (2018). Health anxiety and cyberchondria among Ege University health science students. *Nurse Education Today*, *71*(March), 169–173. https://doi.org/10.1016/j.nedt.2018.09.029

Baumgartner, S. E., & Hartmann, T. (2011). The Role of Health Anxiety in Online Health Information Search. *Cyberpsychology, Behavior, and Social Networking*, *14*(10), 613–618. https://doi.org/10.1089/cyber.2010.0425

Camus, M. (2018). Metro Manila to benefit from 3rd telco service | Inquirer Business. Retrieved February 28, 2019, from https://business.inquirer.net/261714/metro-manila-to-benefit-from-3rd-telco-service?utm_expid=.XqNwTug2W6nwDVUSgFJXed.1

Castro-Palaganas, E., Spitzer, D. L., Kabamalan, M. M. M., Sanchez, M. C., Caricativo, R., Runnels, V., … Bourgeault, I. L. (2017). An examination of the causes, consequences, and policy responses to the migration of highly trained health personnel from the Philippines: the high cost of living/leaving—a mixed method study. *Human Resources for Health*, *15*(1), 25. https://doi.org/10.1186/s12960-017-0198-z

Donnellan, M. B., Oswald, F. L., Baird, B. M., & Lucas, R. E. (2006). The Mini-IPIP scales: Tiny-yet-effective measures of the Big Five factors of personality. *Psychological Assessment*, *18*(2), 192–203. https://doi.org/10.1037/1040-3590.18.2.192

Gass, M. A., & Gass, M. (2016). Risks and Benefits of Self-Diagnosis Using the Internet By.

Goldberg, L. R. (1990). An Alternative 'Description of Personality': The Big Five Factor Structure. *Journal of Psychology and Social Psychology*, *59*(6), 1216–1229. https://doi.org/10.1037//0022-3514.59.6.1216

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2014). Partial least squares structural equation modeling (PLS-SEM). *Sage Publisher*. https://doi.org/10.1108/EBR-10-2013-0128

Hair, J., Hult, G., Ringle, C., & Sarstedt, M. (2014). Partial least squares structural equation modeling (PLS-SEM). *Sage Publisher*. https://doi.org/10.1108/EBR-10-2013-0128

Halder, S., Roy, A., & Chakraborty, P. K. (2010). The influence of personality traits on information seeking behaviour of students. *Malaysian of Library & Information Science*, *15*(1), 41–53. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=13946234&AN=50567756&h=G69OOo2Pf3oWrXTV3xzWD/xN8m4SZKdoCHogFM5Kn50EVKzyEIcZZ/GRHzo4d58X2/8qPGVYLLsiLN09G53RLg==&crl=c

Heiman, H., Keinki, C., & Huebner, J. (2018). EHealth literacy in patients with cancer and their usage of web-based information. *Journal of Cancer Research and Clinical Oncology*, *144*(9), 1843–1850. https://doi.org/10.1007/s00432-018-2703-8

Inthiran, A. (2016). Online Health Search Experience: Sentiments from South East Asia. *International Journal of Knowledge Content Development & Technology*, *6*(2), 29–42. https://doi.org/10.5865/ijkct.2016.6.2.029

Karabeliova, S., & Ivanova, E. (2014). Elaborating on Internet addiction and cyberchondria–relationships, direct and mediated effects. *The Journal of Education Culture and Society*, (1), 127–144. https://doi.org/10.15503/jecs20141-127-144

Krishnan, S., Lim, V. K. G., & Teo, T. S. . (2010). How does personality Matter? Investigating the impact of Big-Five personality traits on Cyberloafing. *International Conference on Information Systems 2010 Proceedings*, 1–16.

Maier, C. (2012). Personality within information systems research: A literature analysis. *ECIS 2012 - Proceedings of the 20th European Conference on Information Systems*. Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-84905734768&partnerID=40&md5=40e8a556937fe3bdeec1319379017af2

Maier, C., Weberei, A. Der, Laumer, S., Weberei, A. Der, Wirth, J., Weberei, A. Der, … Weberei, A. Der. (2017). Personality and Technostress : Theorizing the Influence of IT Mindfulness. *ICIS 2017 Proceedings*, 1–11.

O'Mathúna, D. P. (2018). How should clinicians engage with online health information? *AMA Journal of Ethics*, *20*(11), 1059–1066. https://doi.org/10.1001/amajethics.2018.1059

Ozowa, V. (2017). Perceived Effect of Personality Traits on Information Seeking Behaviour of Postgraduate Students in Universities in Benue State , Nigeria.

Ramírez-Correa, P. E. (2017). Relationship Between Cyber Plagiarism and the Big Five Personality Traits: an Empirical Study in a Chilean University. *Holos*, *5*, 125. https://doi.org/10.15628/holos.2017.5191

Ranada, P. (2019). Duterte signs universal health care law. Retrieved February 26, 2019, from https://www.rappler.com/nation/223942-duterte-signs-universal-health-care-law

Selvi, Y., Turan, S. G., Sayin, A. A., Boysan, M., & Kandeger, A. (2018). The Cyberchondria Severity Scale (CSS): Validity and Reliability Study of the Turkish Version, *20*(4), 241–246.

Singh, K., & Brown, R. J. (2014). Health-related Internet habits and health anxiety in university students. *Anxiety, Stress, & Coping*, *27*(5), 542–554. https://doi.org/10.1080/10615806.2014.888061

Starcevic, V. (2017). Cyberchondria: Challenges of Problematic Online Searches for Health-Related Information. *Psychotherapy and Psychosomatics*, *86*(3), 129–133. https://doi.org/10.1159/000465525

White, R. W., & Horvitz, E. (2002). Cyberchondria : Studies of the Escalation of Medical Concerns in Web Search.

White, R. W., & Horvitz, E. (2012). Studies of the onset and persistence of medical concerns in search logs. *Proceedings of the 35th International ACM SIGIR Conference on Research and Development in Information Retrieval - SIGIR '12*, 265. https://doi.org/10.1145/2348283.2348322