5-2018

Negative Effects of Online Health Communities on User's Health: The Case of Online Health Forums

Tareq Nasralah
Dakota State University, Tareq.Nasralah@trojans.dsu.edu

Ali Ahmed
University of Massachusetts Lowell, Ali_Ahmed@student.uml.edu

Abdullah Wahbeh
Slippery Rock University of Pennsylvania, Abdullah.wahbeh@sru.edu

Hassan Alyami
Dakota State University, hmalyami@pluto.dsu.edu

Areeba Ali
Government College Lahore Pakistan, Areebanadeem2512@gmail.com

Negative Effects of Online Health Communities on User's Health: The Case of Online Health Forums

Tareq Nasralah
Dakota State University
Tareq.Nasralah@trojans.dsu.edu

Ali Ahmed
University of Massachusetts Lowell
Ali_Ahmed@student.uml.edu

Abdullah Wahbeh
Slippery Rock University of Pennsylvania
Abdullah.wahbeh@sru.edu

Hassan Alyami
Dakota State University
hmalyami@pluto.dsu.edu

Areeba Ali
Government College Lahore Pakistan
Areebanadeem2512@gmail.com

ABSTRACT

In recent years, there has been a dramatic increase in usage and acceptance of online health forums. It has been observed that people are searching their health problem online and posting their symptoms on online health forums. The research hypothesizes that the users may have negative effects on their health by receiving incorrect information about a medical issue from another user. The users relate their symptoms to other users while using online forums because they are incapable to evaluate the authenticity of information. The research will be carried out by selecting online health forum and its data mining will occur by using various machine learning techniques and the data will be evaluated to observe the negative impacts on user's health.

Keywords (Required)

Dark side of IT, online forums, health informatics, negative effects.

INTRODUCTION

In recent years, there has been a dramatic increase in usage and acceptance of online health forums. It has been observed that a massive number of people are searching their health problems online and posting their symptoms on online health forums (Sinha, Porter, & Wilson, 2018). The growth of healthcare forums and online social networks has steered the patients to share information voluntarily about their treatments, health, and the use of the drug. HealthBoards.com, Medications.com, MedHelp.org and SteadyHealth.com are examples of those online forums which have depressed the obstacle for patients to report online about their experiences. This study analyzed the positive and negative impacts of online health forums on the health symptoms of individuals living with some sort of chronic diseases by analyzing the user's posts on the health forums. We would analyze it by performing text mining techniques.

Therefore, we are hypothesizing that the symptoms of a chronic disease patient may worsen with the use of false or irrelevant information provided on online health forums because they can be easily misguided by pseudoscientific information because they can't verify it (Sudau et al., 2014). The patient may have negative effects on his/her health by interacting with other users while using online forums. We will be using content analysis of data collected from an online health forum. The study would also highlight the consequences of dissemination of incorrect information over the internet and how users relate their symptoms to other users while using online forums.

LITERATURE REVIEW

Over the past 40 years, online health communities have received attention as agents in the reshaping of healthcare (Zhao, Ha, & Widdows, 2013). Previous research on online health communities has focused on design principles related to what makes such communities effective and successful (Krcmar, Arnold, Daum, & Leimeister, 2002; Leimeister, Ebner, & Krcmar, 2005)

missions, benefits, and drawbacks of online health communities (Finn & Lavitt, 1994; Jayanti & Singh, 2010; Josefsson, 2005) and psychological factors shaping users' attitudes and behaviors(Maloney-Krichmar & Preece, 2005; Preece, 2001).

Virtual communities are a growing source of informational and emotional support for individuals dealing with health concerns. In these communities, support is available at any time needed when individuals seek it. In addition, within these communities, participation provides members with opportunities for supportive communication, such as express empathy or encouragement. Also, the exchange of informational support is also characteristics of these communities (Welbourne, Blanchard, & Boughton, 2009).

Zhao, Ha et al. (2013) investigated the use of online health communities for healthcare from a relationship-building perspective. The theoretical background of the study was the commitment-trust theory of relationships. The main assumption was "perspective taking, empathic concern, self-efficacy, and network density affect the development of both cognitive and affective trust, which together determine online health communities members' membership continuance intention and knowledge contribution". Data analysis showed that perspective taking and self-efficacy are positively associated with cognitive trust and affective trust. Network density contributes to cognitive and affective trust. Cognitive trust and effective trust influence membership continuance intention, while only affective trust impacts members' knowledge contribution behaviors (Zhao et al., 2013).

Yu (2011) conducted a study on the emotional world of health online communities. The authors used the sentiment analysis approach to analyze data from a large online health community, WebMD. The objectives of the study are "examine the strength of various kinds of emotions (positivity, optimism, negativity, anxiety, anger, and sadness) in online health forum discussions, and compare the emotional status and expression of forum participants under different roles". Two experimental studies to compare the overall emotion strength in each forum, and "group the sentences by the authors' roles, namely original posters and the responders, men and women, and caregivers and patients, and then compare the emotion strength of different groups". Results showed that the physician-moderated cancer treatment forum demonstrates the weakest strength in every kind of emotion except for negativity, the breast cancer forum demonstrates the strongest overall emotion strength characterized by strong positive emotion and optimism, and finally, the breast cancer support group demonstrates the strongest social support.

Huh, McDonald et al. (2013) have conducted a qualitative study to understand how moderators fulfill patients' information needs. The authors have analyzed data from 480 patient and moderator posts from six communities. Results and data analysis showed that "patients use the community as an integral part of their health management practices". According to the findings, the authors suggested: "enhancements to moderated online health communities for their unique role to support patient care".

Biyani, Caragea et al. (2014) have studied an online cancer support community by analyzing a set of messages extracted from the forum to identify the two types of social support present in them, namely, emotional and informational. The author tackled the problem as a binary classification problem. As set of features were extracted from the data. Experimental results showed high classification accuracy. The classifier then used to predict types of support in "cancer survivors network messages and analyze the posting behaviors of regular members and influential members in cancer survivors network in terms of the type of support they provide in their messages". The authors concluded that emotional support is more dominant than informational support in such community.

Wang, Zhao et al. (2014) have studied online health communities, where members of such communities "interact online with those who face similar problems and are involved in different types of social supports, such as informational support, emotional support and companionship". Following a case study approach, the authors studied a breast cancer survivor within an online community. Machine learning techniques are used to uncover types of social support within the chosen online health community. Data was aggregated from users' profile with user's involvement in various types of social support. Results revealed that users play different roles in the online health community. In addition, "users' levels of engagement in an online health community are related to various types of social support in different ways".

Nettleton, Sarah et al., (2005) studied deeply on the increasing trend of people consulting online about their health. She found in her studied that people who search are a lay man and they do not have enough mental capacity to evaluate the authenticity of the provided information, so it can be a misguiding information which might relate to their symptoms or it can be entirely irrelevant which could worsen their condition if followed.

Overall, most of the studies tried to address the type of supports that patients can seek without paying attention to how such support can negatively affect patients' health status. In some cases, information seeking can negatively affect patients, especially when it comes to online news and other types of social media. In that context, it is worthy to have a look at how the content of social media can negatively affect patients' status.

IMPORTANCE OF THE RESEARCH

The research is highly relevant and important in this current technological age. A lot of people are searching their health problems online. According to 2011 Pew Research Center report, 80% of internet users have looked up health information online. These 80% users translate into 59% of all American adults (Fox, 2011). People are increasingly interested in learning about others health condition and understanding their health symptoms. Approximately, 34% of internet users, which estimates to be 25% of American adults, have read someone else's commentary or experience about health or medical issues on an online news group, website or blog. These numbers are drastically increasing as people are using the internet and getting comfortable with the use of online forums and social media but these people have insufficient expertise to access the authenticity of the information provided on the online forums (Hirji, 2004). There is also a significant problem associated with information dispersion on online health-related websites. Sometimes, there is wrong information or totally irrelevant information for a user which he or she believes is very important for the optimal health. There is also a huge problem associated with the marketing of healthcare products or treatments, which have no beneficial effects on the user.

To understand and examine this problem it is very important to systematically analyze the health-related information which is freely available on the internet. The research would investigate the following problems:

- Long-term effects on user's health symptoms who uses online health forum for informational, emotional, or any other kind of support.
- The negative effect on user's health after following a medical advice provided by another user on the online health forum.

METHODOLOGY

The research will be conducted by using online health forums such as Medhelp.org. We will create a crawler on these online forums' websites to extract those comments and posts of the users with different diseases. Then we will use text mining & sentiment analysis with various machine learning techniques to analyze and evaluate the negative comments and posts. This will also help in analyzing the effects on health by recommendation of drugs based on another user if it was used after the post. The research roadmap has the following steps as shown in Figure 1.

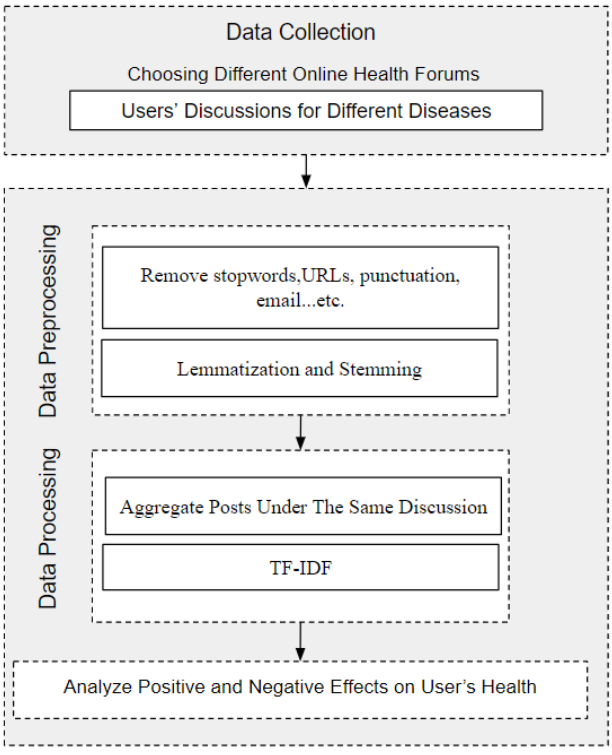

Figure 1. Data Analysis Steps

EXPECTED CONTRIBUTIONS

By answering the research question in a systematic approach, we would be able to understand the confusing role of online health forum in the management of patient's health. This research would also open new frontiers of research on the dark side of technology and its effect on human health. It will also help the health authorities and pharmaceutical companies to keep a check on the post-marketing surveillance and take actions if required.

REFERENCES

1. Biyani, P., Caragea, C., Mitra, P., & Yen, J. (2014). Identifying Emotional and Informational Support in Online Health Communities. *Proc. of The 25th International Conference on Computational Linguistics, COLING '14*, *1*(1), 827–836.
2. Finn, J., & Lavitt, M. (1994). Computer-Based Self-Help Groups for Sexual Abuse Survivors. *Social Work With Groups*, *17*(1–2), 21–46.
3. Fox, S. (2011). The social life of health information | Pew Research Center. Retrieved March 3, 2018, from http://www.pewinternet.org/2011/05/12/the-social-life-of-health-information-2011/
4. Hirji, F. (2004). Freedom or Folly? Canadians and the Consumption of Online Health Information. *Information, Communication & Society*, *7*(4), 445–465.
5. Huh, J., McDonald, D. W., Hartzler, A., & Pratt, W. (2013). Patient moderator interaction in online health communities. *AMIA ... Annual Symposium Proceedings. AMIA Symposium*, *2013*, 627–36. Retrieved from
6. Jayanti, R. K., & Singh, J. (2010). Pragmatic Learning Theory: An Inquiry-Action Framework for Distributed Consumer Learning in Online Communities. *Journal of Consumer Research*, *36*(6), 1058–1081.
7. Josefsson, U. (2005). Coping with Illness Online: The Case of Patients'Online Communities. *The Information Society*, *21*(2), 133–141.
8. Krcmar, H., Arnold, Y., Daum, M., & Leimeister, J. M. (2002). Virtual communities in health care. *ACM SIGGROUP Bulletin*, *23*(3), 18–23.
9. Leimeister, J. M., Ebner, W., & Krcmar, H. (2005). Design, Implementation, and Evaluation of Trust-Supporting Components in Virtual Communities for Patients. *Journal of Management Information Systems*, *21*(4), 101–131.
10. Maloney-Krichmar, D., & Preece, J. (2005). A multilevel analysis of sociability, usability, and community dynamics in an online health community. *ACM Transactions on Computer-Human Interaction*, *12*(2), 201–232.
11. Nettleton, S., Burrows, R., & O'Malley, L. (2005). The mundane realities of the everyday lay use of the internet for health, and their consequences for media convergence. *Sociology of Health and Illness*, *27*(7), 972–992.
12. Preece, J. (2001). Sociability and usability in online communities: Determining and measuring success. *Behaviour & Information Technology*, *20*(5), 347–356.
13. Sinha, A., Porter, T., & Wilson, A. (2018). The Use of Online Health Forums by Patients With Chronic Cough: Qualitative Study. *Journal of Medical Internet Research*, *20*(1), e19.
14. Sudau, F., Friede, T., Grabowski, J., Koschack, J., Makedonski, P., & Himmel, W. (2014). Sources of information and behavioral patterns in online health forums: Observational study. *Journal of Medical Internet Research*, *16*(1), e10.
15. Wang, X., Zhao, K., & Street, N. (2014). Social Support and User Engagement in Online Health Communities (pp. 97–110). Springer, Cham.
16. Welbourne, J. L., Blanchard, A. L., & Boughton, M. D. (2009). Supportive communication, sense of virtual community and health outcomes in online infertility groups. In *Proceedings of the fourth international conference on Communities and technologies - C&T '09* (p. 31). New York, New York, USA: ACM Press.
17. Yu, B., & Bei. (2011). The emotional world of health online communities. In *Proceedings of the 2011 iConference on - iConference '11* (pp. 806–807). New York, New York, USA: ACM Press.
18. Zhao, J., Ha, S., & Widdows, R. (2013). Building Trusting Relationships in Online Health Communities. *Cyberpsychology, Behavior, and Social Networking*, *16*(9), 650–657.