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Mining Twitter to Assess the Opioid Crisis

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Mining Twitter to Assess the Opioid Crisis

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Abstract

Opioid addiction is one of the largest and deadliest epidemics in the United States. This research investigates opioids’ epidemic by analyzing recent tweets data for users who are addicted or have been addicted to opioids. Automatically analyzing social media users’ posts of opioids addicted users using machine learning tools can help understand the themes and topics that exist in the up-to-date discussions of online users of social media networks. Through the analysis period from 01/01/2016 to 02/25/2019, we were able to identify 571 self-identified Twitter users. We collected a total of 20,609 English-language tweets that belong to the self-identified users. Overall, we identify the different recovery approaches, illicit drug use and user seeking for help. This study helps elicit how the daily posts and activities of online social media users can provide a better understanding of the opioid crisis strengthen the public health data reporting and collection for opioids epidemic.

Background

Using machine learning tools to automatically analyzing the daily tweets of opioid addicted users can help understand different themes. These include the way that leads them to be addicted, the illicit ways that they get opioids, how they manage their addiction if they do, what kind of medications they use to recover, what other drugs they take or are addicted to. This research studies the perceptions of opioid addicted users. The key implication for practice, first, it can help understand the common concerns of opioid-addicted users. Second, it can address the most discussed topics on social media for the opioid addicted users. Third, it can get insights about the daily lifestyle of opioid addicted users by analyzing their daily posts on social media to help provide better opioid prevention, treatment, and recovery strategies. Finally, it can strengthen the public health data reporting and collection through the reports of the collected data and analysis results.

Literature Review

Social media users’ posts were used to better understand providers’ attitude toward using recovery drugs such as ‘naloxone’ to treat opioid addictions (Haug et al. 2016). Several studies have used social media as a source of input data to identify individuals amenable to drug recovery interventions (Eshleman, Jha, and Singh 2017) and use text mining to examine and compare discussion topics of social media communities to discover the thematic similarity, difference, and membership in online mental health communities (Park, Conway, and Chen 2018). Glowacki, Glowacki, & Wilcox (2017) have utilized text mining to analyze the public’s reactions to the opioid crisis. The authors identified the public’s reactions by identifying the most popular topics tweeted by users. The aforementioned research affirms the potential for analyzing users’ posts on social media as a mechanism to better understand their needs and perceptions toward drug addiction and more specific opioid prescription medication abuse. In this research we emphasize the population of health communities (Park, Conway, and Chen 2018). Glowacki, Glowacki, & Wilcox (2017) have utilized text mining to analyze the public’s reactions to the opioid crisis. The authors identified the public’s reactions by identifying the most popular topics tweeted by users. This research studies the perceptions of opioid addicted users. The key implication for practice, first, it can help understand the common concerns of opioid-addicted users. Second, it can address the most discussed topics on social media for the opioid addicted users. Third, it can get insights about the daily lifestyle of opioid addicted users by analyzing their daily posts on social media to help provide better opioid prevention, treatment, and recovery strategies. Finally, it can strengthen the public health data reporting and collection through the reports of the collected data and analysis results.

Conclusions

From a theoretical perspective, this research highlights the importance of further developing and adapting text mining techniques to social media for drug abuse. Such media represents inherent challenges for text mining given the amount of noise and distortion in the data. Of particular significance is the emphasis on developing methods for improving the discovery and identification of topics in social media data. From a practical perspective, automatically analyzing social media users’ posts using machine learning tools can help understand the users’ themes and topics that exist in the up-to-date discussions of online users of social media networks. Addressing the most discussed topics on social media that relate to drug abuse can help understand the problem dimensions and create the proper strategies.

Figure 1: Drug Abuse Text Mining Framework on Social Media

Methods

Methodology

Figure 2. Search query for the opioid addicted users

Figure 3. Search query for the addicted users’ tweets

Results and Discussion

Overall, the identified categories in the analysis results show the different recovery approaches that the opioid addicted users take to manage their misuse and addiction, the other illicit drugs that they are taking, and they may addict to. Also, the results show the users need for help and information during their health management.

Figure 4. Data volume over the period

Figure 5. Proportion of tweets by category

Figure 6. Cluster of key words from all tweets