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YouTube as a New Medium for Dementia Education Among Chinese Americans

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Abstract

Objective As one of the most popular social media used around the world, YouTube may be able to serve as a new medium for mental health education. This study aims to analyze and compare the performance of YouTube in disseminating dementia education to Chinese Americans at different time points of the upload period.

Methods Dementia educational videos were uploaded to YouTube. Data was collected over a 36-month period. Results from the first year was compared to those from the third year using descriptive statistics and chi square analysis.

Results The dementia educational videos had a total of 9724 viewers, a total combined watch time of 61,720 min, and an overall average view duration of 6.32 min. Compared to the first year, the videos in their third year performed better in delivering content to the targeted viewers (≥ 45 years old). During the third year, the videos had a significant increase in the percentage of viewers who were 45 years or older. The average view duration of viewers who were older than 65 years old was 38.2% longer than viewers who were younger than 25 years old.

Conclusion Over the span of 3 years, YouTube was able to tailor the dementia educational videos to the older population (≥ 45 years old) who were at the highest risk of dementia. YouTube is a valuable tool that is able to deliver content to interested audience across different age groups.

Keywords Social media · Dementia · Stigma · Mental health · Machine learning

Introduction

In the past decade, the Internet has introduced a new communication medium for the public, health professionals, educators, patients and caregivers. In 2010, an estimated 61% of all adults in the United States searched online for health information, and 39% of those did so via social media (Craig and Strivens 2016). YouTube has become one of the world's most popular social media, attracting over one billion unique users with over 6 billion hours of viewing time every month (Kwok et al. 2017). YouTube can be used to provide education, to examine the quality of information available to public, and to deepen our understanding of the current attitude towards specific mental health disease.

YouTube may thus provide valuable information to ethnic communities that have been harder to reach via traditional methods (Moorhead et al. 2013).

The Chinese American community has been immune to traditional methods of dementia outreach. Studies have shown that Chinese Americans significantly underutilize mental health resources, which has led to a greater risk for both delayed diagnosis and suboptimal management of dementia (Woo 2013). Dementia refers to a syndrome that is characterized by a progressive deterioration in neurocognitive skills and in capacity for independent living (Small et al. 1997). While there is no treatment available to reverse the course of the disease, early diagnosis is crucial in enhancing the quality of life for patients and their caregivers (Leifer 2003). When compared to Caucasian patients with dementia, Chinese American patients are receiving diagnoses at later stages of the disease, after severe neuropsychiatric symptoms develop, and are less likely to receive dementia treatment (Woo 2017).

One major barrier that is preventing the early diagnosis of dementia among Chinese Americans is the lack of

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knowledge about the disease (Diamond and Woo 2014). A previous study showed that approximately 60% of Chinese Americans have the incorrect perception that dementia is a part of the normal aging process, and 67% of them falsely identified symptoms of late stage dementia as early symptoms (Woo 2013). The causes of this disparity include a lack of culturally tailored resources and a strong negative cultural stigma against mental illness (Zheng and Woo 2016). New efforts have been made to lower the stigma against dementia. For example, a study showed that a culturally tailored short film had a promising impact in modifying misconceptions about dementia among Chinese Americans (Zheng et al. 2016). Additionally, studies have shown that the anonymity of YouTube could be advantageous for subpopulations who are hesitant to seek help due to cultural stigma (Lal and Adair 2014). YouTube videos could serve as another significant outreach tool for Chinese Americans who are lacking in knowledge about dementia, or those who are trapped by the negative stigma from their community.

E-mental health provides many advantages such as lowered cost, convenience and global outreach. However, one major concern about dementia education via social media is its ability to target older audience who may not be familiar in seeking medical education through sites such as YouTube. In this study, we examined the performance of YouTube in targeting a Chinese American audience for dementia education.

Methods

YouTube

A board certified psychiatrist was invited to give an educational talk about dementia at the North American Chinese television station in Los Angeles. The entire show was conducted in Cantonese. The recording was then uploaded on YouTube as two 25-min videos titled “Understanding Dementia” and “Dementia Prevention” in Chinese (Woo 2014a, b). Contents of the videos included the definition of dementia, and general knowledge including symptoms, staging, risk factors, and different types of dementia such as Alzheimer’s disease. The videos also covered the importance of early diagnosis, the different types of mental exams available, potential medical problems that may cause dementia, and current therapies available to patients with dementia (Woo 2014a, b).

Sample

The sample of this study included all viewers residing in the United States who have watched the videos during the 36-month period from January 2014 to January 2017.

Statistical Analysis

Data was recorded between January 2014 and January 2017 by YouTube-specific algorithms. The performance data of YouTube videos is only available to the user who uploaded the videos and is unavailable to the public. We were able to retrieve the data via YouTube Analytics which provided parameters including number of views, watch time, average view duration, gender of viewers, traffic source, and the number of likes, shares, and subscriber. The ages of viewers were stratified into six groups: younger than 25 years, 25–34 years, 35–44 years, 45–54 years, 55–64 years, and 65 years and older. Studies have shown that symptoms of dementia most often present among individuals who are 65 years of age or older (Zheng and Woo 2017). Therefore, the target age group was set at 45 years and older to include the high risk group as well as the group entering the high risk ages. Descriptive statistics and chi square test were used to compare the performance of the videos in the first year and in the third year.

This study used anonymous data collected exclusively by YouTube, and did not pose any risks to the participants. A waiver for Institutional Review Board exemption was obtained through the University of California, Los Angeles (UCLA)—Human Subjects Protection Committee.

On behalf of all authors, the corresponding author states that there is no conflict of interest. All authors certify responsibility for the manuscript.

Results

Between January 2014 and January 2017, the dementia educational videos had a total of 9724 viewers, with 5340 (55.0%) female viewers and 4384 (45.0%) male viewers. The videos had a total combined watch time of 61,720 min, and an overall average view duration of 6.32 min. There were 35 likes, 16 comments, 181 shares, and 8 subscribers (Table 1).

The YouTube videos in the third 12-month period (year 3) had a better performance compared to the first 12-month period (year 1) in terms of the follow parameters: (1) longer total watch time (35,166 vs. 8682 min), (2) more number of viewers (5391 vs. 1335), and (3) more number of shares (108 vs. 0).

The YouTube videos also performed better in targeting viewers who were 45 years old or older in year 3 than in year 1. Compared to year 1, the videos in year 3 had a significant increase in the percentage of viewers who were within our targeted age of 45 years or older (62.0% vs. 46.0%, $df = 2$, $\chi^2 = 147.46$, $p < 0.01$). The percentage

Table 1 Descriptive summary of YouTube performance by gender and age in Year 1 and Year 3

Variable	Year 1, % (N)	Year 3, % (N)
Gender		
Female	49.0 (654)	58.0 (3127)
Male	51.0 (681)	42.0 (2264)
Age		
13–24	16.8 (224)	8.0 (431)
25–34	18.0 (240)	16.0 (861)
35–44	19.1 (255)	14.0 (755)
45–54	19.1 (255)	17.0 (916)
55–64	17.0 (227)	23.0 (1240)
65+	10.0 (134)	22.0 (1186)

Table 2 Comparison of traffic sources between Year 1 and Year 3

Traffic source	Year 1, % (mins)	Year 3, % (mins)
YouTube search	37 (3237)	7.10 (2480)
Suggested videos	34 (2956)	66 (23361)
Direct links	16 (1378)	16 (5582)

of viewers who were older than 65 years old had the most increase, from 10.0% in year 1 to 22.0% in year 3. This age group also had a 24.1% increase in their average viewing duration (7.63 vs. 6.15 min). The percentage of viewers who were between 55 and 64 years old also increased from 17% in year 1 to 23% in year 3, with an 18.4% increase in average view duration (7.90 vs. 6.67 min). On the other hand, the percentage of viewers who were younger than 45 years old decreased from 18.0 to 13.0%. The percentage of viewers who were younger than 25 years old had the most decline from 17.0% in year 1 to 8.0% in year 3. The average view duration of this group was 38.2% shorter than the average view duration of viewers who were 65 years or older (5.52 vs. 7.63 min).

In terms of traffic sources used by viewers, YouTube suggested videos was the most commonly used traffic source in year 3, followed by direct link and YouTube search (67.0% vs. 16.0% vs. 7.0%). In contrast, YouTube search was the most commonly used traffic source in year 1, followed by YouTube suggested videos and direct link (37.0% vs. 34.0% vs. 16.0%) (Table 2).

Discussion

Previous studies have shown that YouTube is a valuable platform for disseminating schizophrenia education to young adults (Lam et al. 2017). However, few studies have examined whether YouTube is an attractive platform for

disseminating education on diseases that are more prevalent in the later stages of life such as dementia (Zheng and Woo 2017). This study compared the performance of YouTube in disseminating dementia education between its first and third year to Chinese Americans who are at the highest risk for dementia (≥ 45 years old). The YouTube videos had a better performance in delivering information to the targeted age group in the third year than in first year, with more number of views and shares, and a longer total viewing time. The recorded average view duration of 6.32 min coincided with the reported median engagement time of 6 min across on-line education videos of variable lengths, suggesting that the videos were able to capture viewer's attention (Guo et al. 2014).

The YouTube videos also performed better in targeting viewers who were 45 years or older in year 3, with a significant increase in the number and the percentage of viewers who were within this age group. This pattern was most pronounced in viewers who were 65 years or older. Conversely, the percentage of viewers in the youngest age group (< 25 years old) decreased by 53% during this similar period. This shift in the distribution of viewer's age and engagement time suggests that (1) viewers who were 45 years old or older were more interested and engaged in the dementia educational videos than younger viewers, and that (2) YouTube was able to tailor the videos to those who were most interested in the content over the span of 3 years.

Our results also demonstrate YouTube's ability to analyze video and user's streaming pattern over time to disseminate videos to specific populations who may be interested in such topic. This was evident in the changing pattern of the videos' main traffic source between year 1 and year 3. During year 1, the videos relied mostly on YouTube search, while during year 3, the videos relied mostly on YouTube's suggested videos. Studies have shown that the suggested videos provided by YouTube were generated by considering multiple factors including (1) content data, meaning the raw video streams and metadata such as title and description, (2) explicit user activity data such as rated, liked, or subscribed videos, and (3) implicit user activity data such as viewing time of specific videos (Davidson et al. 2010). Hence, when the videos were first uploaded to YouTube, little video metadata and raw streams were available for analysis. However, as the videos slowly gained more traffic, more data was available to match it to interested viewers via YouTube specific algorithms (Davidson et al. 2010). Therefore, despite the decreased percentages of people using YouTube search and direct links by year 3, the videos were able to reach out to significantly more viewers at the targeted age (≥ 45 years old), and were able to obtain a longer engagement time among these individuals. This finding highlights YouTube's potential in disseminating health information

to targeted audience. While various search engines and websites are available for health information, most require users to actively search for such titles or keywords. YouTube's ability to tailor its videos via specific algorithms may play a significant advantage in health information dissemination. Users may receive lists of "suggested videos" on their YouTube homepage or while they watch similar related videos. Previous studies have shown that different titles may also affect viewer's interest in similar videos. When a more stigmatized term of schizophrenia in Chinese was used in the video's title, the video had a poorer performance than when a more neutral term was used. Hence, it is important to note that we must also pay considerable attention in navigating through cultural stigma in mental health disorders (Lam et al. 2017). Additionally, to maximize YouTube's potential as a platform for education dissemination, future studies should also explore how different video formats and contents, for example, short films versus lectures, may affect viewer's engagement time.

One of the limitations of this study is the lack of demographic information about the viewer's ethnicity and socioeconomic status. Based on the fact all titles and video contents were in Chinese, and that the videos were only limited to individuals residing in the United States, our study assumed that the majority of viewers are Chinese Americans who are fluent in this language. Future studies should consider collecting more demographic information because they could provide insights into how social factors can affect the use of social media. This study also did not examine viewer's knowledge on dementia before and after viewing the videos; therefore, we cannot evaluate the effectiveness of the videos in improving knowledge about dementia. Another limitation of this study is the short average viewing duration of 6.32 min. In the future, the authors plan to shorten the video durations, and include more focused and interactive content to keep viewers engaged.

One important component of education is the ability to deliver related content to the right group of audience. As ethnic minorities such as Chinese Americans continue to be immune to traditional outreach methods, it is important that we explore and expand on existing outreach methods. YouTube is a valuable tool that is able to deliver content to interested audience across different age groups. By incorporating culturally-sensitive and engaging content, YouTube can serve as a new medium to reach out to Chinese Americans who are experiencing suboptimal dementia care due to language barriers and negative cultural stigma.

Acknowledgements This study used anonymous data collected exclusively by YouTube, and did not pose any risks to the participants. A waiver for Institutional Review Board exemption was obtained through the University of California, Los Angeles (UCLA)—Human Subjects Protection Committee.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent This study used anonymous data collected exclusively by YouTube.

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