RESEARCH-ARTICLE

Towards Understanding Substance Abuse Misinformation in YouTube Videos

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ABSTRACT

Trigger warning: texts and figures contain substance abuse, addiction, and mental illness

YouTube is increasingly being utilized to acquire information about substance addiction and treatment experiences. However, the questionable quality and reliability of health information in addiction-related videos can concern help seekers and may potentially mislead some patients in managing addiction and seeking treatments. This poster presents our preliminary findings on the creators of addiction-related videos and the types of misinformation they may disseminate. We discovered that these creators often present inaccurate information and knowledge, offer advice based on personal experiences, display triggering content, and understate the difficulty of recovery. These preliminary findings will guide our future analysis of addiction misinformation within a more extensive set of YouTube videos.

CCS CONCEPTS

• **Human-centered computing** → **Empirical studies in collaborative and social computing**.

KEYWORDS

YouTube; videos; addiction; misinformation

1 INTRODUCTION

Video-sharing platforms such as YouTube [2] provide a valuable resource for individuals struggling with mental health issues, including substance addiction, as they offer a means to access health information and learn from others' experiences with medication [13]. However, user-generated videos may disseminate unverified

information and even encourage unhealthy behaviors. Video creators share their knowledge and personal experiences with addiction to engage viewers. Treatment centers are also using YouTube to advertise their services and treatments. However, studies have found that, on average, 40% of health-education videos on YouTube are of poor quality or unhelpful [17]. Despite the widespread use of these health videos as sources of information for health management, there is a significant knowledge gap regarding the types of addiction-related health misinformation present on YouTube and the identities of their creators. In this study, we take an initial look at the creators who share addiction-related health information, aiming to identify any misinformation they may be disseminating on YouTube.

This poster presents our data collection methods and preliminary results. Initially, we identified 222 YouTube channels belonging to organizations, individuals with addiction, professionals, and storytellers. We collected extensive video data from these channels. Utilizing natural language processing on closed captions, we pinpointed video clips containing addiction health information. A clinical expert then annotated a sample set of 100 video clips to identify instances of misinformation. We have summarized four types of misinformation that could mislead viewers: inaccurate information and knowledge about addiction, suggestions based solely on personal experiences, promotion of addiction triggers or drug use, and understatement of the difficulty of recovery.

2 BACKGROUND

In 2019, 60.1% of people in the U.S. aged 12 or older used a substance (i.e., tobacco, alcohol, kratom, or an illicit drug) [1]. Moreover, 20.8% reported drug use (e.g., marijuana, opioids, hallucinogens, etc.) in the same year [1]. Video-sharing platforms like YouTube are increasingly used for addiction help-seeking, where people learn through presentations, guides, vlogs, and informational videos [4, 9]. YouTubers share personal addiction experiences, educational content, and advocate for understanding addiction [12, 14]. Various stakeholders, including patients, television media, companies, universities, organizations, and governments, are producing mental health-related videos [15]. Videos on YouTube discussing polydrug use often address issues such as sobriety and experiences of controlled use [7]. The educational content about addiction on YouTube is primarily informal, and users share both celebratory and cautionary videos to alert viewers [11].

Despite the benefits of platforms like YouTube, health misinformation remains a substantial issue. Videos discussing cannabis often depict its use and even promote synthetic cannabinoids (K2) [5], as well as the recreational vaping of marijuana [10, 19]. However, only a minor fraction of such content is age-restricted for viewers under 18 [8]. The widespread nature of substance use videos and

the misinformation they contain emphasize the imperative for HCI and CSCW researchers to delve into a deeper understanding of substance use-related content on YouTube. Platform designers and policymakers require a systematic understanding of the types and source of misinformation, which will enable them to design effective moderation strategies for addiction-help-seeking on YouTube, thus protecting help-seekers from potential harm caused by health misinformation. In this study, we compile an extensive collection of addiction-related videos and undertake an initial analysis to identify the misinformation within them.

3 IDENTIFY ADDICTION VIDEO CREATORS

Figure 1 illustrates the data collection procedure. This paper focuses on video creators who regularly post about substance use, addiction, and recovery. To search for these channels, we utilized the YouTube Data API V3[1]. We employed a list of wildcard search keys, such as "<term> addict*", using common addiction-related terms (e.g., "Benzodiazepines," "benzos," "Xanax," etc.), as suggested by the CDC[2]. Additionally, we included terms like "alcohol," "weed," and "marijuana" given that they are commonly addictive substances. To remove less viewed channels, we filtered out those with fewer than 379 video views, seven subscribers, and four videos (all thresholds represent the 25% quantile for each metric). We also confined our search to channels in English due to challenges in analyzing non-English videos. This process resulted in a final selection of 2,032 channels.

We then randomly sampled 600 channels to identify those dedicated to addiction topics and categorize their identities. We sampled 90 channels and used affinity diagramming to identify common channel types. This led to the classification of four categories: *organization*, *people with addiction*, *professionals*, and *storytellers*, as defined in Table 1. Subsequently, the 600 channels were evaluated by three researchers independently, with each channel being reviewed by two researchers. Each researcher chose all applicable identities for each channel. In cases of disagreement, the two researchers met to resolve the differences in their annotations. This step resulted in the identification of 222 individual channels dedicated to addiction-related topics, including 143 organization channels, 47 people-with-addiction channels, 20 professional channels, and 11 storyteller channels.

Identity	Definition
Organization	A channel managed by a treatment center, service, NGO, or other organizations.
People with addiction	A former or current individual creator who vlogs addiction experiences and/or shares addiction feelings and knowledge.
Professional	An individual doctor, psychologist, and therapist who manages a YouTube channel.
Storyteller	A storyteller, journalist, interviewer, and podcast host who show or document others' addiction problems.

Table 1: Identity Category and Definition.

4 IDENTIFY ADDICTION HEALTH INFORMATION

Researchers collected all available videos from the 222 identified channels on YouTube. We excluded videos shorter than 10 seconds, with fewer than 45 views, and without creator-added subtitles, resulting in a pool of 9,838 videos. As many of these videos are lengthy and can contain various types of information and misinformation, we utilized closed captions to segment videos and remove sections not related to addiction. Punctuator[3] and NLTK sentence tokenization[4] were used to identify sentences within closed captions, allowing us to split the videos accordingly.

We then used spaCy [6] to process the subtitle texts and identify names and entities. Word embeddings were employed to recognize all entities related to substances, medications, treatment programs, and life-change keywords – the three most common types of information found in YouTube videos according to [14]. Substance and medication keywords encompassed 134 unique chemical and disease names, such as "alcohol," "overdose," "painkiller," "PTSD," and so on. The 150 program keywords included terms associated with addiction treatment programs and services, like "AA," "NA," and "addiction treatment." The 43 life-related words were connected to managing addiction in everyday life, examples being "craving," "detox," and "stigma." Some videos' subtitles were generated by YouTube automatic captioning, which might misrepresent the spoken content due to mispronunciations, accents, dialects, or background noise [5]. Therefore they keyword list contains many words to detect as many candidate clips as possible. We tokenized and lemmatized all the closed caption texts to verify whether each sentence contained the keyword tokens. Sentences without any keyword embeddings were discarded. We then merged consecutive sentences into larger video clips if these sentences were contiguous and contained keywords. Each clip has its text and the start and end time within the video. After the filtering process, we were left with 82,679 video clips. To better comprehend the content of the videos, we randomly selected 25 clips from creators of each of the four identified categories (totaling 100 clips) to discern misinformation present in the videos.

5 ADDICTION MISINFORMATION

Among the 100 video clips, a clinical expert – a licensed clinical psychologist with over 25 years of research and clinical experience working with individuals struggling with substance use disorders – identified 25 clips that contained misinformation. Since we annotated multiple clips of each video, one video could contain multiple instances of misinformation. This section outlines the four main categories of misinformation detected in these videos.

5.1 Inaccurate Addiction Information and Knowledge

The most common type of misinformation involves presenting inaccurate information and knowledge about addiction, as observed in 13 video clips. These clips include speeches, conversations, and podcasts that discuss addiction or recovery, often incorporating

Figure 1: Data collection steps.

unscientific or misleading health information. For instance, in one video promoting micro-dosing (Figure 2-a), the speaker stated, *"So if you do like 20 micrograms of LSD on day one, and you do 20 micrograms of LSD on day two, you're not really going to notice it on day two, which is why the micro-dosing protocol is two times a week for five to ten weeks."* Nevertheless, available data suggesting any real benefit of micro-dosing LSD is limited[6]. In another video about addiction (Figure 2-b), the speaker claimed, *You really have to deal with the root of the addiction. Addiction is actually a sensation. So when a person takes alcohol, they become addicted to alcohol, or a drug, they are actually addicted to the sensation."* Yet, studies indicate that addiction is a more complex issue than merely being "addicted to the sensation" [18].

5.2 Giving Suggestions Based on Personal Experiences

The second type of misinformation involves creators offering medical or behavioral advice based on personal experiences, as seen in eight clips. When sharing personal addiction experiences on YouTube, creators often suggest that their experiences are common and could be applicable to other patients. Some creators provide medical advice based on their own experiences. For example, one individual said, *"We don't know who the hell we are in early recovery. I'll tell you right now you're a completely different person when you're on drugs and alcohol versus when you're off drugs and alcohol."* However, recovery experiences can significantly vary from person to person, and it could be arguably inappropriate for individuals who are not health care providers to give medical advice. In another video, a YouTuber shared her experiences with pain medication (Figure 2-c) and suggested, *"So you don't need to actually take those pills for that amount of days. I know for me when I had one of the last surgeries. After the surgery, they just prescribed Tylenol and Ibuprofen."*

5.3 Presenting Addiction Triggers or Promoting Drug Use

Two videos contain content that could potentially trigger relapses or even encourage the use of addictive drugs in certain situations. The video shown in Figure 3-a features a speaker saying, *"Alcohol was the hardest one to kick. Alcohol withdrawal is not a joke. It is so underrated."* In this video, the YouTuber discusses the challenges of quitting alcohol while drinking a beer on camera. This act of consuming beer could trigger cravings in viewers with a history of addiction. In another video (Figure 3-b), the YouTuber suggests using amphetamines as a means to quit drinking, stating, *"I got no problem taking a small amount of legally prescribed amphetamine*

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[6]https://www.nytimes.com/2022/02/28/well/mind/microdosing-psychedelics.html

to not drink anymore. I mean, that's the effect. It's such a small dose that I don't really notice it." Suggesting that taking amphetamines has only a minor effect can be dangerous as the impacts of any medication can vary greatly depending on the individual and their medical history. Furthermore, if a viewer were to end up using both substances, the combined effects of amphetamines and alcohol could be harmful and potentially fatal.

5.4 Understating the Recovery Difficulty

Addiction recovery is often a challenging process. However, videos posted by organizations may understate the difficulty of recovery in their treatment program advertisements. For instance, in one video from an organization's channel (Figure 3-c), the speaker describes his personal experience while promoting their treatment program. Yet, the video shows people surfing and relaxing on the beach, implying that the recovery service is akin to a fun vacation. Such a portrayal could foster misconceptions that recovery is an easy and enjoyable process.

6 DISCUSSION

This poster presents our analysis of addiction-related videos on YouTube. We discovered that organizations such as treatment services and centers are the most common creators of addiction-related content. Approximately 21% of channels are run by YouTubers with past or current addiction issues. Alarmingly, health misinformation is prevalent, with 25% of the videos in our sample containing misinformation or inappropriate content. These findings point to potential avenues for future research.

Firstly, we discovered that the most common type of misinformation involves the dissemination of inaccurate or misleading information about addiction. Given the informal nature of YouTube videos, creators might unintentionally distribute incorrect information to their viewers. Moreover, some creators use the platform to promote unverified or alternative treatments that are not recognized by traditional media [3]. Future research could explore the application of AI techniques to identify videos that contain incorrect or unverified addiction knowledge. Knowledge graph-based methods tailored to substance use, for instance, could be promising in identifying such misinformation [16]. As these videos often make claims about addiction, incorporating methods that can assess the accuracy of content related to addiction terminologies (e.g., LSD, sensation) might further aid in detecting misleading health information.

Secondly, our analysis indicates that sharing personal addiction and recovery experiences is a common practice on YouTube. While these personal narratives can offer valuable insights to other patients, the highly individualized nature of addiction and recovery means that such advice can potentially be misleading or even
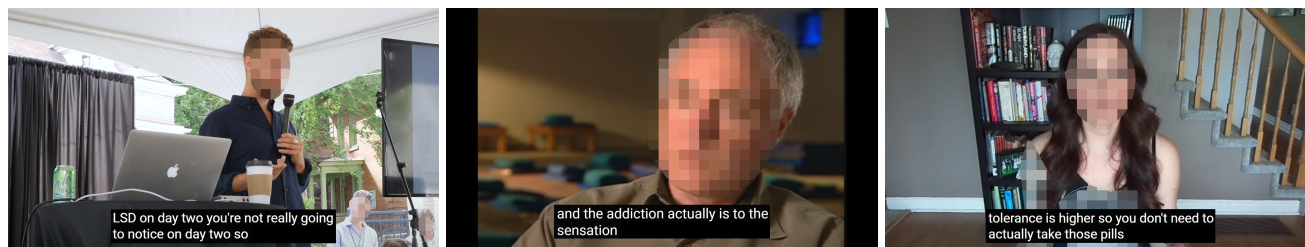
(a) A video talks about LSD micro-dosing.   (b) Addiction is addicted to the sensation.   (c) A YouTuber gives a medical suggestion.

Figure 2: Example videos of YouTubers with vision disabilities. (a) Communication barrier. (b) Web & app. (c) Web & app.
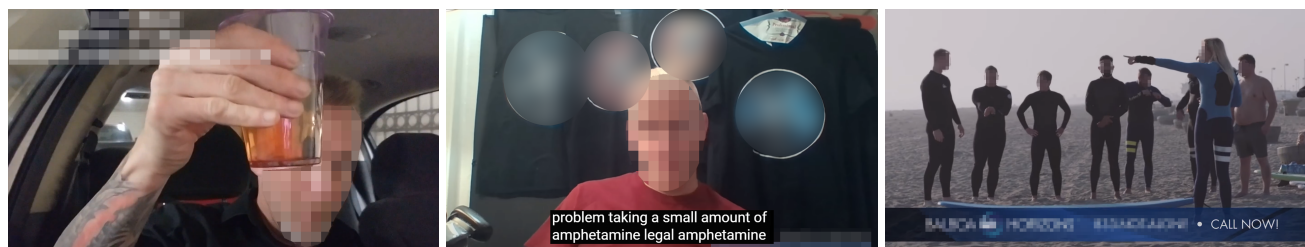
(a) A YouTuber drinks a beer while talking about alcohol addiction.   (b) A YouTuber recommends amphetamine to cure alcohol addiction.   (c) A video shows enjoyable scenes such as beach and surfers at a recovery center.

Figure 3: Example videos of YouTubers with vision disabilities. (a) Communication barrier. (b) Web & app. (c) Web & app.

dangerous without expert oversight. Some creators go as far as to display triggering scenes or promote substance use, which could incite drug experimentation or relapses. Video-sharing platforms should consider the implementation of computer vision and NLP methods to detect such triggering content in videos. Furthermore, guidelines for responsible disclosure should be provided to creators who dispense medical advice. Given that such misinformation often originates from individual YouTubers' videos, factoring in channel types (e.g., personal channels) and video genres (e.g., vlogs) could enhance the identification and discernment of such content.

Lastly, YouTube, as an open and free platform, is used for the advertisement of services and treatment programs. Some YouTubers may also utilize the platform to promote certain programs and medications for financial purposes. Our analysis suggests that organization channels, primarily used to promote rehabilitation and treatments, are the most prevalent type of channel. However, such promotional content can sometimes include inappropriate elements. For instance, as revealed in our data, some health centers portray recovery environments and experiences in an overly positive light in their advertisements, potentially leading individuals with addiction to underestimate the challenges of recovery. Therefore, platforms should establish measures to regulate how treatment services and centers advertise on social media to moderate the spread of inappropriate and unprofessional content. For the identification of such content, the incorporation of sentiment and linguistic features associated with health misinformation targeting consumers could enhance the effectiveness of detection methods.

7 FUTURE WORK

The preliminary findings showcased in this poster outline the future trajectory of our research. In our subsequent work, we plan to analyze a more extensive video dataset to comprehend the extent to which each form of misinformation permeates addiction-related videos. We will explore AI methodologies, such as Large Language Models (LLMs), for the detection of such misinformation. Ultimately, our findings aim to furnish theoretical and empirical insights that could assist in reducing and debunking health misinformation on video-sharing platforms.

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