Education, Personal Experiences, and Advocacy: Examining Drug-Addiction Videos on YouTube

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

Drug addiction has become one of the most severe worldwide social problems. Recent research has examined utilizing social media to support addiction recovery and the problematic use of social media for selling drugs and glamorizing drug use. Prior studies have focused on textual and networking-based social media such as Twitter, Facebook, and Reddit, but there is limited understanding of how video-based platforms like YouTube allow creators to share drug addiction-related videos and discourse about addiction problems. This work performs a content analysis of 387 drug-addiction-related videos collected from YouTube. The grounded-theory approach based on the health-emergency framework identifies how drug-addiction videos discourse the addiction-related risk, blame, urgency, praise, and solution. Video viewership and comments are also compared between the emerged video themes. Results suggest YouTubers educate others about drug addiction, disclose personal experiences, and advocate for addiction prevention and recovery. Based on our findings, we discuss the opportunities and challenges of using video-sharing to prevent and educate drug addiction.

CCS Concepts: • **Human-centered computing → Empirical studies in collaborative and social computing**; *Social network analysis.*

Additional Key Words and Phrases: YouTube, video, drug addiction, mental health, NLP

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1 INTRODUCTION

The United States is facing a mental health and substance abuse crisis. After the US Department of Health and Human Services (HHS) declared a nationwide emergency in 2017, 70,630 people died from a drug overdose, and 10.1 million people misused prescription opioids in 2019[1]. A 2019 HHS survey showed 20.8% of Americans aged 12 or older had a past year's use of illicit drugs [1]. A United Nations report showed that 35 million people worldwide suffer from drug use disorders, while only 1 in 7 people received treatment[2]. COVID-19 worsened the existing addiction epidemic.

[1]https://www.hhs.gov/opioids/about-the-epidemic/index.html
[2]https://www.unodc.org/unodc/en/frontpage/2019/June/world-drug-report-2019_-35-million-people-worldwide-suffer-from-drug-use-disorders-while-only-1-in-7-people-receive-treatment.html

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The disruption due to social distancing hits people with substance disorders hard and causes a shortage of professional treatment and services[3]. Concerns about cost, distance, knowledge gaps, long waiting time, and social stigma also hinder many patients from obtaining clinical treatment [48].

As an alternative, people who experienced mental health problems, especially the young generation, turn to the Internet and social media to seek advice [12, 13]. Social media allow addicted patients and their caregivers to connect to online communities and receive mental health information [13, 33, 66]. Unfortunately, researchers have also noticed the problematic use of social media for encouraging substance abuse and looking for addictive substances [17, 26, 31]. To date, most prior works examining the portrayal of substance use disorders in social media have focused on text-based and networking-based social media. Limited CSCW research has examined how video creators on YouTube, namely "YouTubers," leverage the platform to discourse and advocate addiction-related topics.

YouTube became the most commonly used social media platform in the US in 2019 [6]. The culture of "vernacular creativity" encourages YouTubers to share videos that interest viewers and engage them in online communities [11]. As one of the top video categories, knowledge and how-to videos allow viewers to obtain information in various topics [42] and build informal mentorship [18]. Indeed, researchers have noticed the possible benefits of YouTube in addiction education [45]. However, video-based communication could make addiction education on YouTube different from the peer-support activities on other social media. The openness of YouTube and the nature of user-generated content cannot always guarantee high-quality or even accurate education content. Addiction to drugs is a highly personal and sensitive issue, and publicly disclosing addiction experiences could significantly affect drug users' life. Therefore, it is critical to examine how YouTubers present addiction-related content and educate the viewers through articulating addiction-related causes, consequences, and solutions. This understanding allows video-sharing platforms and services to design new video interaction techniques to spread addiction knowledge accurately and effectively. Platform policymakers also need this knowledge to promote addiction-related videos while protecting people with addiction experiences. In collaboration with a mental health expert, this work presents a content analysis of 387 videos related to drug addiction to address four main research questions:

- RQ1: What are the themes and topics of videos related to drug addiction on YouTube?
- RQ2: How do addiction videos in different themes mention addiction risk, blame, urgency, praise, and solution?
- RQ3: How do video themes affect the viewership of YouTube addiction videos?
- RQ4: What are viewers' comments on the addiction videos in different themes?

RQ1 provides a high-level understanding of what drug addiction videos are available on YouTube and how YouTubers discuss addiction risks and causes, mention the urgency of addiction problems, praise heroic behaviors, and promote solutions. We perform grounded-theory analysis based on the health-emergency framework to identify video themes and analyze addiction discourses [38]. RQ2 further delves into how videos of different themes frame the video content and narrate addiction-related issues. RQ3 compares the subscribers and viewerships of drug-addiction videos to understand viewers' preferences and interactions with the videos in different themes. RQ4 examines video comments through topic modeling to categorize viewers' responses to drug-addiction videos.

[3]https://www.cdc.gov/media/releases/2020/p1218-overdose-deaths-covid-19.html

In summary, three main video themes emerge from our data. Education videos share drug addiction knowledge by promoting addiction programs, encouraging changing lifestyles, and introducing medication. Personal experience videos disclose addicted individuals' or YouTubers' own experiences, including health hazards, life instability, damaged personal relationships, and criminal activities. Advocacy videos have YouTubers telling addiction-related life stories, sharing opinions, and showing actions helping people struggling with addictions. Although many YouTubers aim at making addiction-related videos to promote addiction prevention and behavior change, we notice YouTubers could use inappropriate educational materials and employ scare tactics by disclosing personal experiences. Based on these findings, we discuss implications on the design and policy of drug-addiction-related video-sharing services.

2 BACKGROUND

2.1 Addiction Epidemic and Addiction Education

A 2019 survey conducted by HHS showed that among people aged 12 or older in 2019, 60.1% used a substance (i.e., tobacco, alcohol, kratom, or an illicit drug) in the past month [1]. 20.8% had a past year illicit drug use (e.g., marijuana, opioid, hallucinogens, etc.) in 2019 [1]. Among adults aged 18 or older with past-year serious mental illness in 2019, 47.7% perceived an unmet need for mental health services [1]. Clinical opioid dependence treatments consist of two main types of interventions – the pharmacological interventions, which include the use of opioid antagonists and agonists and other medications, and the psychosocial interventions, including biofeedback, contingency management, 12-step groups, etc. [70]. However, many barriers prevent people from getting professional treatment [48]. A recent study has showed that addicted individuals have low awareness and knowledge of addiction, and it is necessary to provide education based on individual needs [25]. Patients with addictions and people in their support systems need information about pharmacological and psychosocial knowledge, such as addiction and quitting symptoms, behavioral change treatments, and governmental and non-governmental services [25].

The growing need for addiction education drives individuals, organizations, and the government to take action. However, some approaches that aim to educate about and prevent substance use disorders may inadvertently lead to greater harm in a number of possible ways. First, fear-arousal and scare tactics, including horror stories told by recovering addicts, threats intended to create anxiety, and warnings of the tragic consequences of substance use, have been proved to be ineffective in literature [16, 19, 28, 29, 47]. Further, some studies have shown that scare tactics are not concordant with the perceived reality of adolescents [16], can cause ironic effects [19], and may increase drug experimentation among youth [8]. While other researchers argued that fear of drugs could be effective, they must contain recommendations on what actions can prevent addiction [2, 72]. Second, for recovering and recovered people with an addiction history, showing provocative cues related to drug consumption, such as needles, pills, and drug use scenes, could elicit urges and trigger relapses [7]. Ideally, helpful education and prevention approaches should limit the use of provocative triggers and/or provide the individuals with recommended skills to help manage urges and emotional reactions that might be experienced [3]. With the growing popularity of video-sharing platforms, it is essential to examine how YouTubers offer addiction-related information and whether these approaches would introduce counter effects.

2.2 Mental-Health Support through the Internet and Social Media

Studies have found that around 30% of young people who have experienced mental health problems search the Internet to seek help [12]. However, research showed that social media and online forums could be a double-edged sword to addiction recovery.

On the one hand, online communities offer mental-health knowledge and allow patients to connect to supporting groups [13]. Practitioners have examined online platforms' connection and information affordances to help people with addiction. For example, researchers have noticed that Reddit users reveal personal struggles in an online recovery-oriented community [21]. Core members of online health communities monitor members' tapers off of the substance and withdrawal symptoms, while all members provide emotional support and exchange advice [55, 60]. Social computing tools could support building sponsorship relationships, building a peer support network, and allowing users to manage anonymity [33]. Technology designs for recovery processes need to help manage moments of crisis and support privacy and personal safety [63]. The Internet and social media are also rich sources of mental-health information. A study has found users prefer health informatics tools that provide an understanding of the self, the condition, and others' experiences in making sense of chronic conditions [52]. People talk about symptoms and withdrawal approaches in a quit vaping community on Reddit [66]. Mental-health help-seeking tools need to consider connectedness, accessible information, personalization, and immediacy [57]. Mental health technologies should offer customization of functions and ample resources, but not exceed users' mental and motivational capacity [74]. Online mental-health supports can provide information, such as mental health facts created by professionals and online community moderated by trained peer moderators [13].

While studies have noticed the benefits of online tools and resources, another realm of research criticized social media platforms for encouraging substance abuse and lacking regulation. For example, a study has showed that Twitter users discuss prescription drug abuse online and are surrounded by others who also discuss it, potentially reinforcing negative behavior and social norms [31]. Similarly, a content analysis of Twitter addiction-related posts found people show need, shoot, and love of heroin [26]. Users share content about how to abuse opioids and the social impact of opioid abuse; meanwhile, opioid withdrawal was less discussed [53]. Another big-data analysis of opioid use recovery on Reddit found users hope to manage stigma and community behaviors, while Reddit is used for sourcing, selling, and using substances [17]. On Facebook, a study has found the widespread alcohol displays may influence social norms and cause increases in male college students' alcohol use [24]. Recovering individuals have seen social media posts and result in the desire to return to substance use [4]. Facebook posts from news outlets cover more of the urgency of opioid emergency than assigned responsibility or blamed individuals [38]. Therefore, research has examined natural language processing techniques to extract drug abuse information to monitor problematic use of substances [14, 20, 39, 44, 58].

Although a rich body of research has investigated addiction-related content on text-based social media, few studies have examined the roles of YouTube video-creation and video-sharing in delivering addiction-related knowledge and establishing supportive communities. Research has mined addiction-related content on networking-based social media to reveal problematic and unethical uses. However, there is still a limited discern of the opportunities and challenges of using YouTube videos in addiction prevention and recovery.

2.3 YouTube and Addiction Education

YouTube is known as a video-sharing platform of vernacular content and grassroots creativity [11]. The "participatory culture" on YouTube allows ordinary people to create and circulate personally meaningful, everyday, and popular video content [11]. In contrast to platforms based on friending and networking, YouTubers upload interesting video content and establish online communities with the viewers [15, 64, 69]. Informal learning and mentorship are some of the most common motivations to use YouTube, in which people learn in the forms of lectures, guides, vlogs, and

informational videos [18, 42]. Recent research has examined the roles of video-sharing in supporting mental health [41, 49, 51]. YouTubers leverage their expertise to offer social provisions [49]. Viewers actively seek medical information online, and YouTube videos can provide educational information [41]. Patients, television media, companies, universities, organizations, and governments are making mental-health-related videos [51]. YouTube videos have considerable potential to contribute to health improvement, but successful interventions must consider video engagement and production quality [32]. Researchers have realized the impact of YouTube on the knowledge and compliance of the patients; still, there yet lacks the tools for patients to evaluate the advice being given [23].

Only a few studies are examining addiction-related videos on YouTube. YouTube community guidelines forbid posting content related to hard drug use or creation, as it states *"don't post content on YouTube if it ... depicts abuse of or giving instructions on how to create hard drugs such as cocaine or opioids. Hard drugs are defined as drugs that can (mostly) lead to physical addiction."* [73] Since videos promoting hard drugs should be removed, researchers often turn their attention to educational videos or videos about recreational marijuana. Manning examined the vernacular addiction education on YouTube and found users share celebratory and cautionary videos to warn the viewers [45]. Kataja et al. explored videos of polydrug use on YouTube and identified videos sharing sobriety and controlled use experiences [36]. Lim et al. and Krauss et al. found YouTube videos promote the use of marijuana [40, 43]. However, there is little examination of how videos related to hard-drug addiction disclose individual addiction experiences and recommend solutions. It is critical to perform a detailed content analysis on this sensitive context to understand how YouTubers discourse drug addiction on YouTube.

This work extends previous research by both categorizing video themes and also annotating discourse activities (i.e., comments) on videos related to drug addiction. The categorization of video themes offers an understanding of the types of videos on YouTube and the prevalence of different video creation activities. The health-emergency framework is a recently-identified device to categorize social media posts covering drug addiction. We perform a content analysis using the health-emergency framework [38] to examine the disclosing and discourse variables in the collected video data. The framing includes *risks*, *blames*, *urgency*, *praises*, and *solutions* as five frames of addiction-related content on social media (see Table 1 for definitions). Risk refers to the discussion of the consequences resulting from drug addiction. For this frame, we look into how YouTubers mention health, financial, and relationship damage caused by addiction. Blame is the disclosure of the causes of addiction. We annotate whether and how YouTubers explain why they were hooked up with drug abuse for this frame. Urgency is mentioning problems like the opioid epidemic or the number of deaths due to overdose. Praise refers to video content that shares heroic or supportive behaviors that help people with addiction. The solution is mentioning or explaining how addiction can be prevented or treated. The content analysis demonstrates whether and to what degree YouTubers use fear-arousal tactics, tell addiction stories, and promote solutions. We also identify the associations between main video themes and each sub-frame in the framework to depict video creation patterns.

3 VIDEO DATA

The videos are crawled using YouTube Data API[4]. Each search contains one of the substance names from the National Institute on Drug Abuse website[5] and a wild card "addict*" (e.g., "heroin addict*", drug names include weed, marijuana, opioid, opiate, fentanyl, morphine, opium, codeine, cocaine,

[4]https://developers.google.com/youtube/v3

[5]https://www.drugabuse.gov/publications/media-guide/other-commonly-used-addictive-substances

Frame	Definition
Risk	Discussions of risks to society or to individual people, mentions of the risks of becoming addicted, selling drugs, distributing drugs, or secondary risks to individuals
Blame	Accusations, assignment of legal or other responsibility, convictions, or liabilities
Urgency	Rhetoric and phrases that indicate the elevation of a problem to the level of needing immediate attention
Praise	Explicit mentions of praise, commendation, applause, success, or mentioning someone's heroic efforts
Solution	Medical cures, overdose reversal medicine, vaccines, protocol changes, containment strategies, and criminal justice solutions

Table 1. The definitions of frames in the health-emergency framework identified in [38]

and heroin). Before crawling, the authors have tried street names of drugs as search keys (e.g., "coke", "meth", "crack"). But the results contained many irrelevant videos (e.g., "coke" results in Coca-Cola videos), which are hard to be filtered due to the amount and length of videos. Therefore, we only used formal drug names as search keys. Videos were collected between Jan 19, 2021, to Jan 23, 2021, with video dates spanning from Jan 1, 2020, to Oct 30, 2020. Same videos from different searches are merged. The preliminary processing removes videos with non-English words in the title due to the difficulties of analyzing non-English videos. After filtering, 3313 unique videos constitute the video dataset for sampling. Heroin, opioid/opiate, fentanyl, and cocaine are the most commonly mentioned words in the video title, tag, or description (Figure 1). These videos have 158,393,606 views, 2,570,669 likes, and 543,758 comments. The data collection and analysis methods are reviewed and approved by the IRB office at the authors' institution.

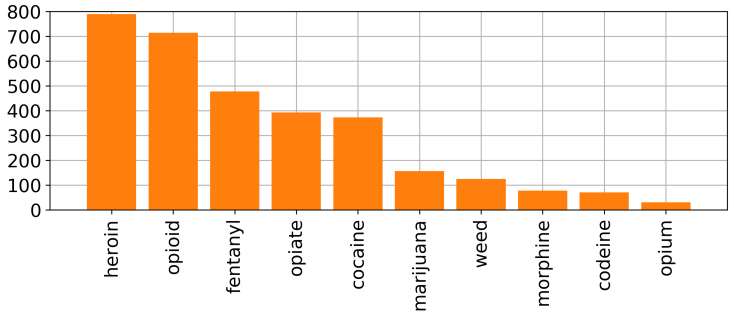


Fig. 1. The distribution of drug terms in 3313 videos. The bars are the number of videos containing each search keyword in either title, tag, or description. A video may mention multiple drug names.

4 METHODS

4.1 Grounded Analysis

The grounded-theory-based method is used to generate and verify the video themes and the sub-frames of the health-emergency framework [46, 65]. The authors follow open, axial, and selective coding procedures. We refer to the video categories identified in [45] to identify video themes. Sub-frames are under the framework of *risk*, *blame*, *urgency*, *praise*, and *solution* as described in [38].

In the open coding phase, we randomly sample 175 videos from the resulting 3313 videos for grounded analysis. Nine are removed because they are deleted or private (YouTube blackscreens

private and age-restricted videos, and not everyone has access). Four researchers distribute and watch all sample videos and take notes related to each frame. For example, when the person in the video mentions addiction-resulted diseases and symptoms like "compulsive heart infection," "diagnose of sclerosis," "damage to the brain," or "overdose," we take notes under the risk frame. For the axial coding, the authors use affinity diagramming to summarize video themes and the collected notes of each health emergency frame. Five video themes are identified: *personal experience*, *education*, *advocacy*, *news*, and *media art & performance* (see Table 2 for definitions). The final sub-frames under the health-emergency framework are described in Table 3. The video themes and sub-frames constitute a codebook for annotating the video data.

Table 2. The themes of drug-addiction videos

Theme	Description
personal experience	The person in the video discloses their own experiences with drug addiction
education	The video seeks to educate the viewers on addiction or promote activities that can lead to addicts' life change
advocacy	Video creators share stories of helping people with addiction, encountering addiction-related issues, or advocating for changing addiction situations.
news	Videos from traditional news media about addiction
art & performance	Videos involving any sort of art (e.g., music, poem, lyric, movie, comedy).

Table 3. The concepts and definitions of sub-frames in health-emergency framing

	Concept	Description
Risk	*health hazard*	Video includes risks to the user's life including: contracting diseases, struggling with mental and physical health issues and death that result from being addicted, and general personality changes.
	criminal	The video highlights the risk of succumbing to temptations of committing criminal activities.
	hurt relationships	This video mentions a risk of lack of control in familial and supportive relationships due to addiction.
	life instability	The user specified in the video has instability in their career, life comforts, and finances due to addiction.
Blame	*systemic*	The video blames the societal systems including: medical system, criminal justice system, recovery programs that don't manage addiction effectively, and general lack of knowledge on addiction.
	toxic relationships	The video blames addiction on the friends or family members who encouraged or led them to use drugs.
	stigma	The video put blames the social stigma of being addicted, pressure from different facets of life, and need for a sense of belonging.
	COVID	Video puts blame on outcomes of the COVID-19 pandemic and exacerbating staying addicted.
	illness	The video blames untreated mental and physical health conditions, predisposition, and unrelenting daily stressors.
	trauma	The video blames turbulence with support systems or traumatic events.
Urgency	*epidemic*	The video mentions statistics about the epidemic and the growing number of drugs in the country.
	overdose	The video mentions the sheer number of lives lost due to battle over addiction.
	treatment	The video mentions urgent need for treatment facilities and programs to be more supportive.
	illegal	The video mentions the urgent increase of legal cases relating to drug addiction.
Praise	*treatment*	The video praise for the treatment, groups, or medical programs that who helped people with addiction to overcome their circumstances.
	self	This video praises individuals who are or have been through personal struggles, their own personality, or other circumstances resulted from addiction.
	support	This video praises or shares stories of relatives, friends, or significant individuals who helped or supported other people with addiction in their addiction journey.
Solutions	*medication*	The video suggests using alternative medications and/or substances as a solution to discomforts associated with addiction is suggested by these videos.
	programs	The video suggests the utilization of various professional and medical groups and institutions to treat addiction is emphasized in these videos.
	authority	The video suggests systemic changes for safer physical and mental spaces from the local and authoritative levels in order to lessen harm of addiction.
	technology	The video promotes using technology such as apps, websites, and social media to assist the user in managing their process of recovering and providing community.
	lifestyle	The video suggests making positive changes in lifestyle and communication with the self and others external to the addict.
	spiritual&religious	The video has suggestions pertaining to faith or religious ideals to assist in recovery are brought up in these videos.
	education	The video emphasize the importance of increased preventative information and health education for both children and adults.

In the selective coding phase, three authors annotate three rounds of 25 videos using the codebook to validate the sub-frames and obtain the inter-rater agreements. All three raters annotate the same 75 videos. After each round, the authors meet together to refine the category definitions and resolve disagreements. Fleiss's kappa with Jaccard distance is used to calculate agreement scores.

However, because many videos are longer than 20 minutes ($mean = 1307.90s$, $SD = 1399.96s$) and all frames contain multiple choices, we notice it is easy for a rater to miss the mentioning of a sub-frame, especially for sub-frames that are less frequently mentioned in videos. Thirteen out of 24 sub-frames do not reach to a substantial agreement level (substantial agreement is $kappa > 0.6$, see Table 4). The authors decide to annotate one video by multiple raters and pick the majority choice as the final annotation to solve the disagreement problem. Three raters first watched and annotated 125 videos each, with one video rated by two different raters. Then for the disagreed sub-frames, the third rater watches the video again to decide whether the sub-frame is mentioned. 14.69% of all the sub-frame annotations have an initial disagreement and receive a third annotation. Eventually, 450 videos are annotated, with each annotation agreed upon by at least two raters.

Table 4. Agreement scores between three raters of annotating 75 videos. The scores are calculated using Fleiss' Kappa with Jaccard method.

Risk				Blame						Urgency	
health hazard	criminal	hurt relationships	life instability	systemic	toxic relationships	stigma	COVID	illness	trauma	epidemic	overdose
0.52	0.69	0.67	0.51	0.48	0.67	0.44	0.76	0.54	0.66	0.74	0.63
Urgency		Praise		Solutions							
treatment	illegal	treatment	self	support	medication	programs	authority	technology	lifestyle	spiritual &religious	education
0.37	0.36	0.66	0.32	0.45	0.72	0.64	0.51	0.59	0.39	0.79	0.40

4.2 Statistical Method

For RQ1, a video's theme and sub-framing mentioning are saved. Considering a video may contain multiple health-emergency components, a dummy variable is used for each sub-frame to represent whether or not the video mentions the sub-frame (1 means containing the sub-frame, otherwise 0). For RQ2, Pearson's chi-squared test (contingency table) identifies significant associations between video themes and health-emergency sub-frames. Video themes are saved as a multi-categorical variable to represent one of the five themes (Table 2). The chi-square test compares the frequency of videos that mention each sub-frame (as dependent variables) between different video themes (as the independent variable). For viewership analysis in RQ3, we perform multivariate regression analyses to predict three dependent viewership measurements – view counts, net likes, and comment counts. All three dependent variables are log-transformed with the natural base e since their distribution is skewed. For videos with zero views, likes, or comments, we set the value to 0.01. The net likes of a video are the log_e of likes minus the log_e of dislikes. Three least-squared regression (LSR) models are built to predict viewership measurements by video characteristics, themes, and frames as simultaneous independent variables. Video characteristics consider the video duration, video age, and uploader's number of subscribers. Duration is the length of the video in minutes. Video age is the number of days between the date when the video was published and the first day of data collection. Considering all health-emergency sub-frames are multi-categorical, we merge all sub-frames of each frame into five independent factors. For each frame, one represents whether a video mentions at least one sub-frame (e.g., the factor for *risk* is set to 1 if at least one risk sub-frame is mentioned). A prior study has suggested subscriber count has a significant impact on video interaction counts [10]; therefore, we include subscriber count in LSR models to examine if the video theme and frame mentioning introduce additional effects on the viewership measurements. We also compare the duration and subscriber count between video themes using the Wilcoxon test. Video watching, liking, and comment data are directly obtained from YouTube API. These factors are commonly used to measure the levels of video interactions [10, 37, 49, 59]. Posthoc analysis is

performed with the Steel-Dwass method. We choose nonparametric comparisons due to the viewership measurements not being normally distributed. The significant threshold ($alpha = 0.05$) is adjusted with the Bonferroni method in all statistical tests.

4.3 Comment Topic Modeling

To understand viewers' responses to drug-addiction-related videos, RQ4 uses Latent Dirichlet Allocation (LDA) to identify main topics in users' comments [9]. LDA is an unsupervised machine learning technique that automatically recognizes main topics from a large textual corpus, widely used in HCI, CSCW, and social media research [34]. We use the YouTube Data API to retrieve all available first-level comments (direct comments excluding replies) of all 450 videos. 49,649 comments left to 296 videos were collected. We remove stopwords, lemmatize all terms, and recognize bigrams from the comment corpus. We keep tokens appearing in more than 20 comments but no more than 20% of all comments. To identify the optimal topic number, we calculate the coherence scores of topic numbers varying from three to fifty. For each topic number, we calculate the coherence scores of models with 30 different alpha-beta combinations (combinations of six alpha and five beta values). Alpha is the document-topic density, and beta is the topic-word density. The coherence score for each topic number is calculated by averaging the scores of 30 modals. Figure 2 shows the average coherence scores versus topic numbers. The result shows the coherence score reaches the highest when the topic number is seven. After examining the alpha and beta values when the topic number is set to 7, the coherence score reaches the highest value of 0.65 when alpha is 0.01 and beta is 0.01. Therefore, we use this LDA model configuration ($topic_num = 7$, $\alpha = 0.01$, $\beta = 0.01$) to classify comment topics. The topic index with the highest probability is selected for each comment. To gain a deeper understanding of the LDA-identified topics, Linguistic Inquiry and Word Count (LIWC) software [56] is used to calculate the emotional tone of each topic (corpus created by merging all comments of one topic). LIWC is also widely used in HCI and CSCW research to imply psychological processes from social media posts (e.g., [22, 27, 30]).

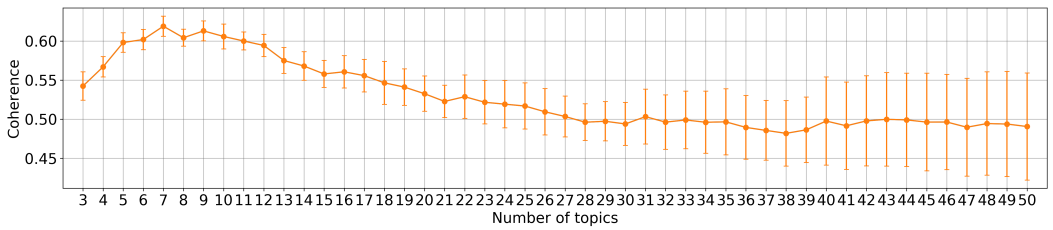


Fig. 2. Coherence scores of the LDA models ranging from 3 to 50 topics. The score of each topic number is the average coherence score of 30 models (built with the same topic number but different α and β). Error bars are one standard deviation. The coherence score reaches to the highest when the topic number is seven.

5 RESULTS

5.1 RQ1: Themes and Topics of Addiction Videos

RQ1 explores the themes and topics of YouTube addiction-related videos. The annotation removes 26 videos (23 with broken links and three non-English videos). Education, personal experience, and advocacy are the top three common themes (Figure 3 left), and news and art&performance take less than 10% of videos. Five videos are categorized as "other" since their content is irrelevant to addiction (e.g., mentioning "weed" as garden plants or "being addicted" as "very interested in something"). We do not exclude videos with potential misinformation (e.g., people may not tell

the true stories about their addiction, or a promoted treatment program may not be effective) or debatable content (e.g., videos argue for or against the legalization of marijuana) since we focus on understanding the overall video themes and it is challenging to determine the truthfulness of the stories and the correctness of opinions. The annotation of the health emergency frame in 424 videos shows that videos include language about risks, blames, and solutions more often than urgency and praise (Figure 3 right). 283 (66.75%), 244 (57.55%), and 278 (65.57%) videos mention at least one type of risk, blame, and solution, respective to each frame. By contrast, 344 videos (81.13%) do not mention any urgency sub-frames, and 300 videos (70.75%) do not contain praise sub-frames. Almost half of the videos tend to disclose or discuss the risks of health issues resulting from addiction (*risk.health hazard*). Mental and physical illness condition (*blame.illness*) is the most mentioned addiction cause. More than 20% of the videos also share people's life fallout related to addiction, including life instability (*risk.life instability*), criminal activities (*risk.criminal*), broken relationships with families and friends (*risk.hurt relationships*), and toxic relationships with wrong people (*blame.toxic relationships*). Recommending treatment programs (*solution.programs*) and making positive changes in lifestyle (*solution.lifestyle*) are the most common solutions mentioned in the videos.

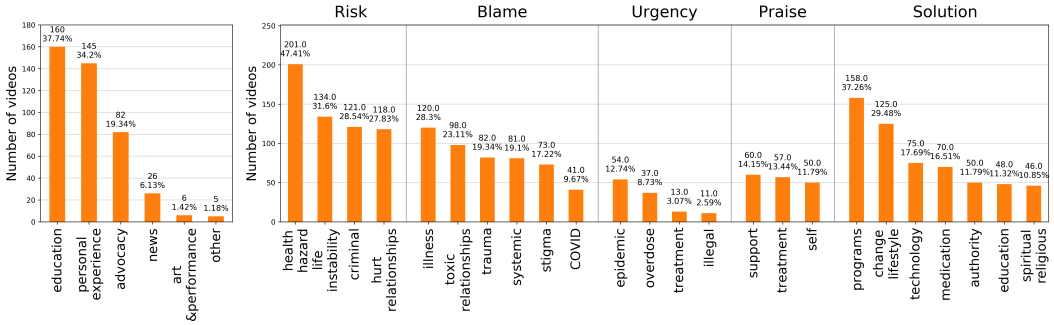


Fig. 3. Left: The distribution of video themes. Right: The distribution of sub-frames in each health-emergency frame.

These results suggest that YouTube is primarily used as a platform to share educational content, disclose personal addiction experiences, and document life stories and share opinions related to addiction. YouTubers tend to mention the causes and consequences of addiction and share potential solutions with the viewers. Unlike the stories in the news media [38], YouTubers do not intensively mention the urgency of addiction problems or praise positive behaviors and activities. Mental-health-related information is widely mentioned in YouTube addiction videos, including illness conditions, health problems resulting from addiction, treatment programs, and change of lifestyle. Problems in personal lives such as problematic relationships and illegal activities are also disclosed. The analysis of RQ2, RQ3, and RQ4 focuses on education, personal experience, and advocacy videos since the news videos are made mainly by traditional TV media, and only a small proportion of videos are art&performance. The top three themes have 387 videos in total. These videos come from 244 unique YouTube channels and have 18,169,726 views and 316,242 likes. Since videos were randomly sampled, the mentioning of drug names in the title, tag, or description is similar to the overall distribution (105 heroin, 87 opioid, 67 fentanyl, 47 opiate, 39 cocaine, 23 marijuana, 19 weed, 9 morphine, 6 opium, and 6 codeine). Wilcoxon test suggests mentioning any drug names in the title, tag, or description does not lead to significantly more video views, comments, and likes.

5.2 RQ2: Health Emergency Framing of Different Video Themes

RQ2 examines how the health emergency sub-frames are mentioned by videos in different themes. Figure 4 shows the distribution and significant associations.

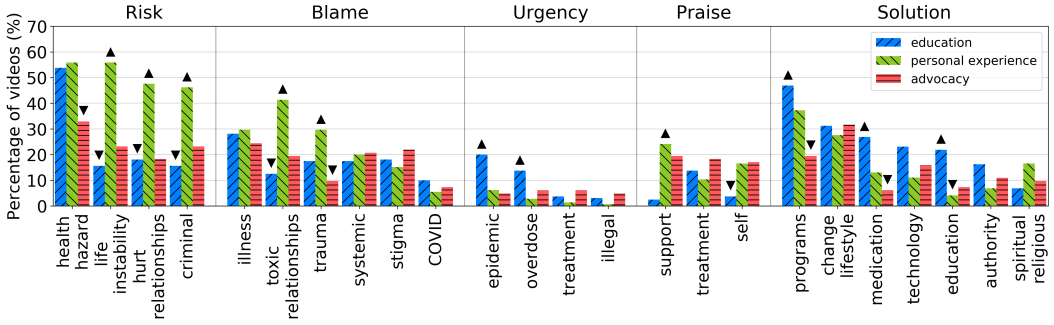
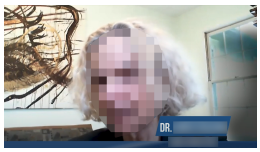


Fig. 4. The distribution of video themes in each sub-frame of the health-emergency frame. Upward triangles indicate significant positive associations, and downward triangles indicate significant negative associations.

5.2.1 Education Videos. Educational videos explain addiction-related knowledge in three main ways. Some videos are narratives in which the YouTubers talk at the camera and give tips or information (Figure 5-a). Some videos are interviews of experts or individuals with addiction experiences are interviewed (Figure 5-b). There are also videos in the forms of infographic, animation, or slide presentations (Figure 5-c). The chi-squared test (see Figure 4 for the result) suggests education videos are significantly associated with solution sub-frames of programs, medication, and education. They are also significantly associated with urgency sub-frames of epidemic and overdose. In education videos, the YouTubers may explain practices and facts about treatment programs (Figure 5-d with *solution.programs*) and medication knowledge (Figure 5-e with *solution.medication*). YouTubers also advise viewers to avoid addictive substance (Figure 5-f with *solution.education*). More than 10% of videos also use the opioid epidemic (Figure 5-g with *urgency.epidemic*) and the number of deaths caused by addiction (Figure 5-h with *urgency.overdose*) to raise viewers' awareness.

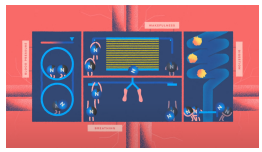
Addiction treatment services and professionals are using YouTube to share knowledge and resources. Like one channel (~34k subscribers) mentioned on the channel page (paraphrased, same below) *"We want to give you the knowledge and skills you need to help yourself and your family recover from addiction. Stay 5 Steps Ahead of Addiction by subscribing to this channel!"* Another channel (~7k subscribers) seeks to promote Ibogaine by *"providing real-life proof of Ibogaine's amazing effectiveness as a cure for addiction, depression, PTSD, and other conditions."* YouTube is a free online source of addiction-related information and knowledge. However, we noticed that YouTubers often directly show potential triggering scenes, such as drug shooting scenes, needles, and pills (Figure 5 e, f, and g) in education videos. These video contents could trigger relapses in people who are currently recovering and should contain trigger warnings.

5.2.2 Personal Experience Videos. The second most common use of YouTube is disclosing and sharing personal addiction experiences. These videos are also in the form of interviews or narratives to the viewers face to face. Some videos are made by YouTubers interviewing currently addicted people, especially those who are homeless due to addiction. For example, our dataset has 21 videos made by a channel (SWB) with ~2.6m subscribers. Their videos are interviews of addicted people who disclose reasons for being addicted and the harsh lives with addiction (Figure 6-a). Some other

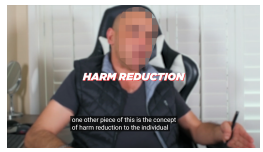


(a) A government official explains substance use disorder during COVID-19.

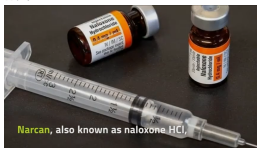
(b) A YouTuber and a person with addiction explain the danger of Fentanyl.



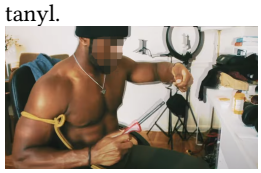
(c) An animation video explaining what causes opioid addiction.



(d) A doctor explains harm reduction as a treatment strategy.

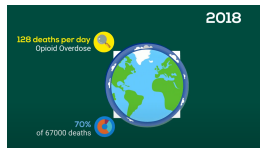


(e) A video explains if the benefits of Narcan is greater than the negative effects.



(f) A YouTuber imitates drug shooting before talking about heroin and sugar addiction.

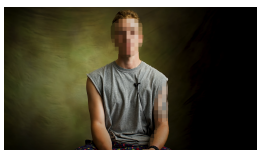
(g) A YouTuber explains the relationships between cannabis and the opioid crisis.



(h) A video shows 128 deaths per day in 2018 due to opioid overdose.

Fig. 5. Example education videos. Original videos show the faces. The mosaic is added by the authors.

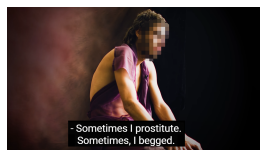
YouTubers who interview addicted people on the street also call on the viewers to offer help (Figure 6-b). There are also recovered people sharing their addiction experiences and recovery journeys, such as the feelings of being addicted and the experiences with detox treatment or medication (Figure 6-c).



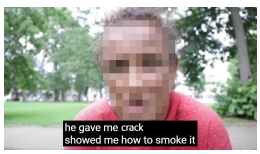
(a) A person with heroin addiction is interviewed by SWB.

(b) A person with addiction who lives on the street is interviewed. The YouTuber gives her necessities donated by the viewers.

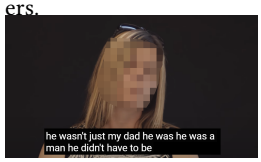
(c) A recovered YouTuber explains his detox experiences with Kratom.



(d) A person with addiction tells the interviewer they prostitute and beg for money.

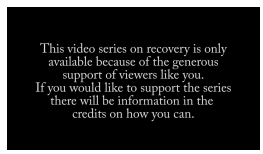


(e) A person with addiction says being molested since three years old and learned to do drugs from a boyfriend.



(f) A recovered person thanks her dad for the support.

(g) An interview video shows the park where a person with addiction is living in.



(h) A YouTuber asks viewers' support at the beginning of a video.

Fig. 6. Example personal experience videos. Original videos show the faces. The mosaic is added by the authors.

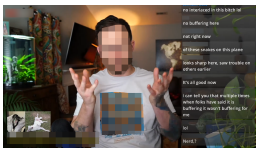
Personal experience videos are significantly associated with risk sub-frames of life instability, hurt relationships, and criminal activities. They also have significant associations with blame sub-frames of toxic relationships and trauma, and the praise sub-frame of support. More than 40% of personal experiences videos disclose consequences of being addicted. The disclosure includes living on the street, losing custody of children, and conducting criminal activities, such as drug dealing, prostitution, and theft (Figure 6-d with *risk.life instability* and *risk.criminal*). Around 30% of personal experience videos also disclose reasons for addiction such as relationships with wrong people or traumatic experiences like domestic violence, losing family members, and child abuse (Figure 6-e with *blame.toxic relationships* and *blame.trauma*). Around 20% also have people with addiction showing appreciation for their supporting systems (Figure 6-f with *praise.support*).

People suffering from addiction generally do not have ways to let their stories be heard. YouTube is used as a window for the public to know the damage caused by addiction and see their living environment (Figure 6-g). YouTubers may view their video creations as humanitarian activities, as it states on SWB's YouTube channel page: *"we interviews and portraits of the human condition."* Some YouTubers call on viewers to donate and offer help to the people they interviewed (Figure 6-b and h). However, most YouTubers didn't apply appropriate steps to protect interviewees' privacy. The agreement might be received by just asking interviewees "is it okay if I upload the video to YouTube?" It is possible that some of these stories could be inspiring and helpful to those in recovery. For example, one recovered YouTuber says on the channel page (~3.1k subscribers): *"I tried for years to flee and hide from my past. [Channel name] was born when I finally accepted it and realized that our tales may assist others. We can draw on our past experiences to assist others."* This indicates YouTubers' motivation to use their own experiences to help people who are currently struggling with drug addiction. Yet, it is also possible that viewing scenes of others getting high or struggling with recovery could be a triggering to trigger vulnerable viewers.

5.2.3 Advocacy Videos. Advocacy videos include YouTubers' opinion-expression and story-telling that show the lives with or supporting activities to people with addiction problems. Out of the 82 videos in this theme, 54 are narrative videos, and 28 are recordings of addiction-related activities. The forms of narrative videos include podcasts (Figure 7-a), live-streams (Figure 7-b), or face-to-face talks to the viewers (Figure 7 c and d), in which YouTubers tell stories of their encounters with people with addiction and express opinions. Some vlogs show heroic or volunteer activities that help people who are struggling with addiction or being homeless due to addiction (Figure 7 e and f). Some videos also introduce the lifestyle at treatment programs or recovery centers (Figure 7-g). Some vloggers enter streets and city districts with severe addiction problems to show the difficult conditions of living on the street (Figure 7-h).

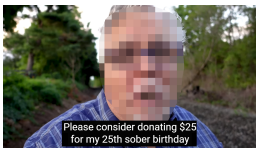
Unlike education and personal experience videos, advocacy videos do not tend to include any health emergency sub-frames. In other words, this theme is less likely to mention health hazards or recommend treatment programs or medication than the other two. Advocacy videos are made by activists or people who care about addiction problems to show their actions against addiction. For example, Figure 7-d is a video calling for donation to IP. IP (~1m subscribers) is a non-profit organization with a YouTube channel which claims *"through storytelling, education, news, and advocacy, aim to give homelessness a face while educating people about the systemic factors that contribute to its existence."* Another YouTuber (~88.3k subscribers) mentioned on the channel page: *"to bring food, free haircuts, hope, necessities, and, most importantly, love to those who are in need."* Another YouTuber (~4.23k subscribers) who regularly uploads commentary videos on addiction says *"I'm traversing the world in my car to show you what drug addiction is and how it appears. I've committed my life to demonstrating what drug addiction looks like before you start using."* Videos in advocacy

(a) Guests share their story about the overdose death of their son in a podcast video.



(b) A livestreamer reads viewers' comment related to addiction and express opinions.

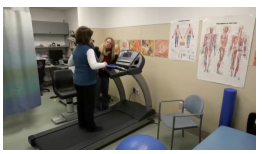
(c) A YouTuber tells an addiction story and comment on the story



(d) A YouTuber (a member of IP) asks viewers to donate $25 to IP to celebrate his 25th sober birthday.

(e) The video documents a father's struggles to save his daughter from drugs.

(f) A video shows a volunteer group distributing viewers' donation to homeless people.



(g) A video introduces lives at a recovery center.

(h) A YouTuber walks on the street and shows people who are affected by addiction.

Fig. 7. Example advocacy videos. Original videos show the faces. The mosaic is added by the authors.

themes suggest YouTube allows activists to share their battles against addiction problems. YouTube lets them tell stories to obtain viewers' support and enable viewers to see addiction conditions.

5.3 RQ3: Video Viewership

RQ3 explores how video themes affect viewership. We first compare video length and subscriber count between the three main video themes. Wilcoxon test suggests subscriber count is significantly different between the three video themes. Posthoc with Steel-Dwass method indicates education videos are made by YouTubers with significantly fewer subscribers ($\chi^2_{df=2} = 40.67$, $p < 0.0001$, Figure 8 left). LSR models are built to predict view count, net likes, and comment count by video theme, subscriber count, duration, video age, and the five dummy variables of whether a video contains at least one sub-frame (see Table 5 for the results). Results show that subscriber count is a positive predictor for view count and comment count. The video theme is a significant predictor for view count and comment count. Posthoc suggests personal experience videos have significantly more views and comments than advocacy videos. Advocacy videos have significantly more views and comments than education videos (Figure 8 middle and right). Blame is the only frame with a significant positive effect on view count. These results show that educational videos are more likely to come from smaller channels with fewer followers. The fewer subscriptions, video views, and comments indicate lower viewer interactions with the video creators. Personal experience videos attracted the most comments from the viewers, while education videos had significantly fewer comments. Videos that disclose the blames of being addicted tend to be viewed more times.

5.4 RQ4: Comment Topics

We use the LDA model to assign each comment to one of the seven topics with the highest probability (see Table 6). The word cloud visualizations in Figure 9 show the keywords in each topic. Identified topics include expressing thought, showing appreciation, expressing feelings, telling personal experiences, showing love and blessing, sharing information, and talking about responsibilities of the government and society. Top 10 comments in each topic can be found in Appendix

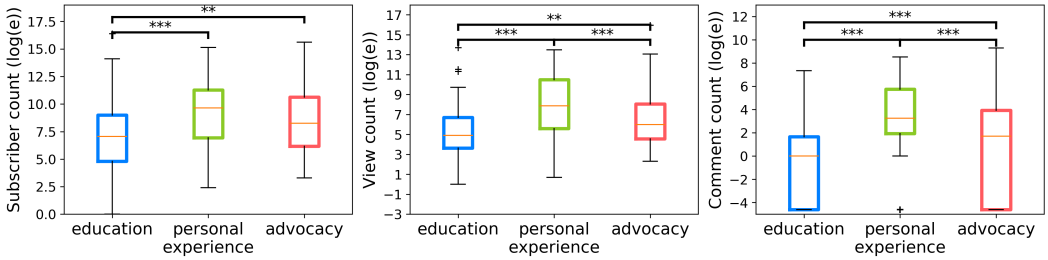


Fig. 8. Left: the range of subscriber count of the three main video themes. Middle: the range of view count of the three main video themes. Right: the range of comment count of the three main video themes. Horizontal bars indicate significant pairwise differences ($p^{*} < 0.05$, $p^{**} < 0.01$, $p^{***} < 0.001$).

Table 5. Statistical results of multivariate LSR models that predict view count, net likes, and comment count. Only statistics with a significant p-value are presented. Video theme is categorical. Adjusted $\alpha = 0.0167$.

	view count $F = 19.69$, $r^2 = 0.36$, $p < 0.0001$			**net like** $F = 0.94$, $r^2 = 0.03$, $p = 0.4936$			**comment count** $F = 18.39$, $r^2 = 0.35$, $p < 0.0001$		
factor	coef	*F* ratio	*p*	coef	*F* ratio	*p*	coef	*F* ratio	*p*
theme	posthoc	19.69	<0.0001	-	-	-	posthoc	27.33	<0.0001
subscriber	1.24e-6	76.21	<0.0001	-	-	-	1.19e-6	36.14	<0.0001
duration	-	-	-	-	-	-	-	-	-
age	-	-	-	-	-	-	-	-	-
risk	-	-	-	-	-	-	-	-	-
blame	0.36	6.87	0.0091	-	-	-	-	-	-
praise	-	-	-	-	-	-	-0.52	5.97	0.0150
solution	-	-	-	-	-	-	-	-	-
urgency	-0.48	8.10	0.0047	-	-	-	-0.88	14.01	0.0002

A. Linguistic Inquiry and Word Count (LIWC) software [56] analyzes the comment emotion tone. Figure 10 shows the LIWC emotion tone (50 is neutral, 100 is the most positive, and 0 is the most negative) and the number of comments on each topic. A chi-squared test is also performed to identify significant associations between comment topics and video themes. Figure 10 and Table 6 show the results (all $p < 0.0001$).

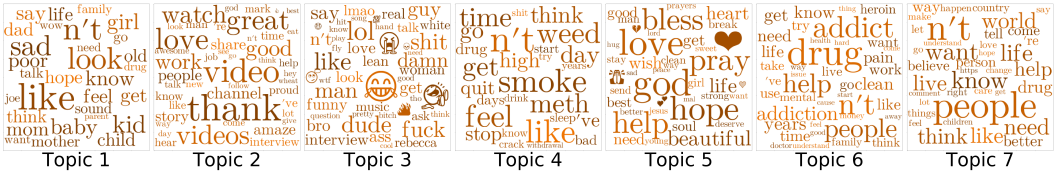


Fig. 9. Word clouds of keywords in each topic. Word sizes are proportional to the word weights in each LDA topic.

The LDA topic modeling suggests seven ways people react to addiction-related videos on YouTube. Personal experience videos have significantly more comments in Topic 5, Topic 1, and Topic 3. Topic 5 consists of viewers' love and blessing to the people presented in the videos, which has an overall positive emotional tone. Topic 1 has a negative emotion tone since they are primarily viewers' discussions and opinions on the tragic experiences of people suffering from addiction.

Topic	Description	Associated video themes
Topic 1 (*express thoughts*)	Comments or thoughts on the person or addiction experiences presented in the video.	personal experience
Topic 2 (*appreciation*)	Appreciation of and reflection on the video.	education
Topic 3 (*feelings*)	Expression of viewers' feelings towards the video content.	advocacy, personal experience
Topic 4 (*viewers' experiences*)	Viewers' personal experiences related to abuse and addiction.	advocacy
Topic 5 (*love & blessing*)	Showing love, blessing, or encouragement to the person in the video.	personal experience
Topic 6 (*information*)	Information related to drugs, medicines, or treatments.	education
Topic 7 (*gov & society*)	Opinions on the governmental or societal responsibilities.	advocacy

Table 6. LDA-identified topics and their associated video themes.

Fig. 10. Emotion tone and the number of comments of each LDA topic, and the associations between comment topics and video themes. Topics are in descending order of comment count. Brighter links indicate significant associations.

Topic 3 is a mix of positive and negative emotional shout-outs using emojis. Advocacy videos are significantly associated with Topic 7, Topic 4, and Topic 3. Topic 7 consists of viewers' discussions of governments' and societal responsibilities on addiction problems, which has a slightly negative tone. Topic 4 is viewers sharing their own experiences with addiction. Education videos have positive associations with Topic 6 and Topic 2. Topic 6 is health information shared by the viewers in the comments. Topic 2 is viewers' appreciation of YouTubers' efforts to create the videos, which has a positive emotional tone.

The comment analysis shows that disclosing addiction experiences on YouTube leads viewers to show love and blessing to the person in videos and express their thoughts and feelings of others' addiction problems. Viewers may encourage the addicted person in the video or show negative emotions, such as sadness and sorrow. The comments to advocacy videos reflect people's awareness of government and society's responsibilities. Viewers also externalize their own addiction-related experiences. In the comments of education videos, people share information about addiction treatment and medicine and show appreciation to the video creators for the content.

6 DISCUSSION

6.1 YouTube as an Online Resource for Addiction Knowledge and Education

YouTube is adopted by many as a place for help-seeking [62] and informal learning [42]. In consistent with prior findings [45], around 1/3 of videos in our data are in the education theme. Our results further identified manners in which YouTubers educate the viewers. Education videos have a higher solution framing, in which YouTubers share information on treatment programs, changing of lifestyle, medication, online resources, and preventive education. The educational content

is delivered through face-to-face narratives, expert interviews, and infographics or animations. Prior studies have suggested that mental-health tools should offer accessible knowledge and allow viewers to receive personalized and immediate information [66]. YouTubers offer a myriad of free and frequently updated education videos to support addiction help-seeking. We find that around 10% of education videos talk about the impact of COVID on addiction, which is perhaps the immediate and needed information for people with addiction. Viewers of education videos appreciate the content in the comments and share their addiction-related information. However, we also noticed that some knowledge videos contain triggering cues. For example, education videos use images and scenes of needles, shooting scenes, and pills as education materials, potentially triggering the relapse of viewers in recovering processes [4, 7]. Education videos come from channels with fewer subscribers. Viewers watch education videos significantly fewer times and leave significantly fewer comments, indicating viewers' less interaction and engagement with the video creator. These results imply that creators of addiction education videos lack guidelines to present their content safely. Their creators may benefit from improved video creation techniques to engage and interact with the viewers better.

YouTube offers free addiction education and knowledge. YouTubers leverage mental health expertise or their own recovery experiences to educate the viewers. Free online videos can be an alternative information source for help-seeking, especially for people who don't have access to clinical treatments and programs. Education videos might also help people with addiction's families learn about treatment programs, lifestyle changes, and medications. However, video-sharing platforms and services should consider helping video creators increase professionalism [13]. Universal and community guidelines for presenting addiction-triggering content are needed for regulating the creation of addiction-related videos. Video-sharing platforms can incorporate object-recognition and speech-detection technologies to detect and alert triggering content in videos. Such technologies can also encourage video creators to deliberate whether to include these video materials. Also, YouTube allows video uploaders to hide numbers of dislikes since 2021, which prevents viewers from assessing the knowledge quality by other viewers' ratings [67]. This could be a critical problem when viewers look up mental health programs and medication information. Therefore, viewers may benefit from search and recommendation algorithms, navigation tools, and indicators of video professionalism to locate high-quality addiction education content [23]. Platform designers and policymakers should also limit low-quality treatment providers from leveraging the platform for advertisement purposes. Last, mental health professionals who make educational videos may want to improve their creation skills to engage more viewers. Interacting with professionals may foster sponsor relationships to receive on-time help [33, 63]. It is beneficial for people in recovery to receive advice and emotional support through online interactions [55, 60]. Platform designers could consider new video creation and interaction technologies to support the interactions between the viewers and video creators.

6.2 Disclosing Addiction Experiences on YouTube

Prior research has found users of online recovery-oriented communities reveal personal struggles and share experiences with others [21]. But technologies for recovery processes should manage users' anonymity and personal safety [33, 63]. Our data analysis suggests that disclosing personal addiction experiences is the second most common theme of YouTube addiction-related videos. Around 1/3 of videos in our dataset are personal experience videos, in which YouTubers interview current people with addiction or disclose their own addiction-related experiences to the viewers. Unlike other platforms, many YouTubers reveal other people's addiction issues in their videos. YouTubers publicly share life instability, broken relationships with families, criminal activities,

toxic relationships, and trauma resulting from addiction. Videos showing blame for addiction problems have higher video views than videos that don't use this frame. Some YouTubers interview homeless people to let the public hear their voices and see their struggle with addiction. Others wish to educate viewers by disclosing their own experiences and health hazards resulting from addiction. Video creators encourage viewers to donate to help. Disclosing personal experiences lead to significantly more views and comments from the viewers. Viewers show love and blessing to people with addiction problems, but meanwhile, the video caused negative emotions in some viewers (as in Topic 1). The approach of sharing addiction experiences could be a scare tactic and can raise fear, which has many proven counter effects in preventing addiction [28, 72]. Prior research has recommended that trained peer moderators provide health information [13, 66]; however, it is highly questionable whether one's addiction and recovery experiences can and should be followed by another person.

YouTubers reveal the lives of people who are struggling with addiction problems. Showing the tragic experiences and living conditions of people with addiction perhaps increases public awareness of the severity of addiction problems and people's willingness to help. However, personal experience videos may lack proper consent from the interviewed people with addiction, especially considering their unique mental health and living conditions. Disclosing one's fallout experiences, criminal activities, and health conditions may cause adverse effects on their future return to a normal life. Video-sharing platforms should avoid "poverty porn" effects[35] – video creators should not gain popularity by exploiting poor addiction conditions to induce viewers' sympathy. Reporting the experiences of people who live on the street might also be misleading. Since it could result in stigma against people with addiction [17] and make viewers feel addiction is only associated with homeless people in problematic city areas. The young generation should be alerted that addiction is more prevalent and can be around them in their everyday life. Although scare tactics and fear-arousal could produce perceived severity and susceptibility, the videos must offer efficacy messages to clarify the steps to prevent addiction [2, 72]. Therefore, video-sharing platforms should consider providing video clips and materials for YouTubers to integrate efficacy recommendations in their videos. Recovered individuals also use YouTube to share their past experiences. Video journaling and the connection with the viewer community can be essential for creators' addiction recovery. Prior research has recommended health information be provided by trained peer moderators [13]; however, it is unknown if the recovered individuals have the correct knowledge to help current substance users. Future research needs to examine designs and platform policies to let the viewers assess creators' expertise. It is also valuable to investigate the effects of video-based peer learning for addiction prevention and recovery.

6.3 YouTube as a Community of Supporting People with Addiction

Activist individuals and organizations are using social media to persuade people through one-way communication [5]. Recent years have seen activists leverage video sharing to express opinions on social issues and motivate collective actions [50, 61, 68]. Besides providing educational content and sharing personal experiences, our findings suggest the emergence of YouTube as a platform for addiction advocacy. People tell addiction stories and advocate for solving addiction problems. About 20% of our videos are advocacy videos, in which YouTubers report addiction problems and share stories of helping people with addiction. Advocacy videos use podcasts, livestreams, and story-telling to depict the addiction situation and advocate the public to care about addiction issues. YouTubers regularly upload videos to connect to the viewers and form online communities. Some YouTubers act as community leaders and social activists to report problems caused by addiction and call attention to the addiction and homeless issues. As a response, viewers share thoughts on

the responsibilities of government and society in the comments and disclose their own addiction experiences.

Social activists and individuals who care about addiction problems use YouTube to raise awareness of addiction problems, demonstrate charitable activities, and connect to supporters. YouTube is an emerging social media platform for community leaders to engage viewers and build reputations. The financial income from video-sharing platforms can be sustainable support for activists and advocates to carry out volunteer actions and help people with addiction. CSCW research should investigate the growing use of video-sharing in anti-addiction advocacy and activism. Prior studies have found humanitarian and nonprofit organizations are sharing videos to distribute knowledge and foster discussion [54, 71]. It will be valuable to understand the use of new video forms, such as video podcasts, livestreams, and vlogs. Research has showed that YouTubers' popularity levels significantly affect video views in a social movement [50]. Designers should examine the technology needs for sharing addiction advocacy videos, increasing visibility, and building anti-addiction communities. Video-sharing platforms should offer platform features to support community activities like donation, discussion, and telling addiction stories.

7 CONCLUSION AND FUTURE WORK

Through analyzing and comparing 387 drug-addiction videos on YouTube, this work provides an understanding of how YouTubers discourse drug addiction issues on video-sharing platforms. Grounded-theory approaches identify video themes and the framing of video content. Three main video themes are identified. Educational videos explain addiction-related knowledge related to a treatment program, lifestyle change, medication, and preventive education. Viewers appreciate the knowledge and share their own information related to addiction. But channels that share education videos have fewer subscribers and receive fewer views and comments. Personal experience videos disclose current or former drug users' addiction experiences. These videos mostly use fear-arousal tactics for addiction education. Personal experience videos have more views and comments. Viewers express love and blessing and negative emotional feelings on others' addiction experiences. Advocacy videos tell stories and record activities to counter substance abuse. Advocacy videos have more comments about the government's and society's responsibility. Our findings suggest video sharing platforms should consider helping YouTubers improve the professionalism of knowledge videos, applying proper measurements to protect the privacy of people with addiction, and supporting anti-addiction communities and activities. Future CSCW research and design should consider supporting knowledge video creation, responsible disclosure of personal experiences, and online activism and advocacy against addiction.

Frankly, drug addiction will remain a severe social and health problem in our society in the coming years. This work is a seminal study to call on the HCI and CSCW community to study the roles of social media and video-sharing platforms in fighting against the addiction epidemic. It is surprising to notice YouTube communities' effort in the battle against addiction and the number of dramatic addiction experiences publicly disclosed on YouTube. There is still a long way to educate the content creators and YouTube influencers to responsively use their video skills and relationships with fans to provide knowledge and share addiction experiences. For example, HCI and CSCW researchers should partner with clinical mental-health experts to identify ways to evaluate video content quality and YouTubers' professionalism to reduce inappropriate video content. The openness of online video sharing could also introduce misinformation and disinformation on the effectiveness of treatments and medications. CSCW researchers should explore indicators of video quality and legitimacy and content warnings to guide video watching of people at different recovery stages. It will also be valuable to interview video creators and information seekers to understand the technological need of receiving help via online videos. Therefore, our future work

will explore video interaction designs that combine machine-learning techniques and social computing approaches to recommend video-based knowledge. We will also delve deeper into addiction education videos and apply education and online learning theories to investigate the effectiveness of video-based education. We will also examine the effects of emerging video/audio applications on addiction education and recovery, such as livestreaming services, short videos (e.g., TikTok), and social audio apps (e.g., ClubHouse).

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A TOP 10 COMMENTS IN EACH TOPIC

Following are the top 10 comments in each topic with the highest probabilities in the LDA model (comments are lightly paraphrased to protect privacy). We do not paraphrase the comments as YouTube does not provide functions to search user comments, and all comments are publicly presented under the videos.

- Topic 1: Comments or thoughts on the person or addiction experiences presented in the video.
  - This is sad D*** D*** hope she wakes up and gets her life back. The pimp provides me everything, not because she thinks he is paying for it since he receives her items, but because he is occupying all of her money and only spending a small amount on her and allowing her to rest. She stated that she is in love with her pimp, who enjoys all women that help him make money. I believe she enjoys the attention he lavishes on her. Her children should remain with her relatives.
  - This guy needs a home. This is so sad he is gonna get f***ed up out there he's brother need to bring him out. He needs a place to live in flat. This is something i feel sad. I know he is a nice person, just needs some help with this s**t f**k the cosmetics. He needs a house a home 🏠 😢
  - She's literally just a baby still 😢😢😢I feel so bad for her just being surrounded by bad people. That poor baby. I hope someone can help the baby to get a better life. I would totally let the baby to come to my home 😢😢😢

  - "My daughter had a good life," says her mother, who is and was a prostitute with addiction issues who put her in a bad condition at home. Rather than moving in with her mother, it appears that the daughter should go to a rehad and get as far away from her as possible. It's terrible for her daughter.
  - Because of the numerous judgments made in response to these comments, prostitutes believe that their "pimps" are their boyfriends who look after them. However, pimps don't care about anyone but themselves, so they brainwash the females and continue to exploit them. The whole "beautiful female" thing is a load of crap. To maintain making money, pimps prefer to butter up their women now and then.
  - I had to return to add the final comment. She had been raped since she was seven years old. I have a 6-year-old child, and I can't imagine how that would affect a youngster's growth. I just can't do it; it's unthinkable. pity the poor kid. I'm curious as to why she was imprisoned! She also claims that her mother will not allow her to return home…ugh
  - The woman had had far too much. She was spoiled as a child, so she does as she pleases. She acts as though she knows everything and that someone owes her anything. I'm sorry to say, but I don't see any changes in the near future. She needs to mature. She claims to reside at a hotel with her father, which is absurd.
  - OMG I'm almost certain I've seen this person around town before. I spotted them on the street just outside the port, and they were always wearing a pink dress, I believe. But based on their appearance, I would never have guessed they were in this circumstance. I'm not sure if it's the same individual.
  - I believe she believes she doesn't make a lot of mistakes on skid row because she acts like a child. She acts as though she is a lost young girl, and that is how others perceive her.
  - What is this woman's point of view? Her child, as far as I know, was in foster homes and was abused. And she claims that she and her mother co-parented her daughter?! And they'd go on adventures together…I'd like to see mother and daughter being interviewed together so they can get their story straight.
- Topic 2: Appreciation of and reflection on the video.
  - Hey Dr. B***, I am from India, where the majority of our food consists of grains such as rice, wheat, different grains, and pulses, and has done so for generations. We consume meat, but grains are a staple in our diet. I follow your work and videos, and while most of them are unquestionably correct, I have my doubts about this one. Because Indians have been eating grains for ages, are you referring to Americans or everyone else in the world?
  - Top notch editing by the way D***. Great quality video. You use great cameras and good editing software. You are producing content better quality than 90% of YouTube channels. I think you could benefit from a direction you would like to take the channel. Sharing one hour or two hour videos is not gonna attracts a lot of viewers.
  - Seeing N*** healthy and vibrant is so heartwarming! Congratulations to her for doing all of those to a better life…it couldn't have been simple, but she made it and I hope she continues her growth in this way for a bigger and even brighter future‼! (Edit Also thank you, for giving her a voice and sharing her story when she felt she didn't have a chance. Your work is priceless).
  - The only grain I consume is one to two slices of Zea bread per week, which I cooked myself. I also barely make a keto cake with flour and nuts, but those are not grains. I do not eat carbs, fruit or processed food, I only eat real food, meat, fish, some leafy greens, avocados, eggs, seeds, butter and some yogurt that I make. Fasting and resistance training are also important.
  - Love your channel. I'm learning the ropes when I need to help with a close friend with her addiction. Thank you for your video. Hope it can help improve some of the "difficult times" between my friend and I. I have started setting the ground work for boundaries and so far she understands, so let's see.
  - N*** always manages to make mecry within the first 5 minutes of these interviews ‼! i tell everyone to watch these videos. The great quotes that N*** has, the wisdom, eloquence, and the ability to portray something so hard in such an influential way is the making for insanely powerful content. WHAT wonderful news to know he finds a job‼ I would be the 1st customer in line to buy N***'s autobiography.
  - N***‼! I love seeing your progress videos! So much information in your words! We have to embrace the oysters in life! Love it! Keep pushing N*** you are so helpful to me and others! I too am an addict, I am in recovering. I started counseling too, it's the only approach for me to get better I have to let it all go! Thank you for sharing! Much love from Texas!
  - N***, you're doing great brother. Something about your energy is so positive and inspiring man; I can't even put it into words brother. You're the greatest person I've ever heard speak before man, just no words to express it but keep on striving.
  - 1st meeting February 19**, sobriety date February 19**, & I still stay in the day that I'm in. 24th August is a while away yet, so be careful brother. I appreciate your ability to serve, & give a voice to people who are invisible, I've been like that too. I can learn a lot from you, blessings ever from B*** to you and all those you cherish brother.

  - I've been keep watching this channel for the past few weeks and it's absolutely great. This channel serves to humanize people that others may otherwise walk right by. Most of the stories are truly mesmerizing. Thank you for creating this and giving all of these people a platform to share stories about their live.
- Topic 3: Expression of viewers' feelings towards the video content.
  - If I ever met small eyes, I would ask him why we ask useless a** questions to black people….. I hate ** ***, this black, and any other white dude interviews rappers asking student questions…… Lets stop this and shut this down. Ask real f**king questions.
  - He thought dude was gay 😹😹😹😹😹😹😹😹😹😹😹😹😹😹😹😹😹😹😹
  - S*** is a weirdo bro , 😂😂😂😂😂😂😂😂😂😂😂😂
  - That intro is f**king rude lmao. Everyone else you start out with them saying hello or some s**t. She's fat so the intro is her eating ice cream and spilling on herself. I f**kin dislike ppl in La
  - This person loses her mind as hell….AFFLLLAACCKKK took me out 😂😂😂😂😂😂😂😂😂
  - Yo that edible story got me crying 😭😭😭😭😭😂😂😂😂😂💯
  - Bru I'm dead….I'm sitting there rubbing my knees NO CAP rubbing my knees😹😹😹😹😹this black guy funny
  - bro just a chill a** dude Fr lmfao. I been f**kin wit the black music for a min but never actually heard him describing his thoughts 💯
  - 800 why he pause like that 😂😂😂😂😂😂😂😂😂
  - Man that beat sound at the beginning slaps 🔥🔥🔥🔥🔥🔥🔥🔥🔥🔥
- Topic 4: Viewers' viewers' experiences related to abuse and addiction.
  - I'm sick and terrified because of my lack of appetite and terrible nausea. I've struggled with anorexia in the past and can't seem to gain weight. I'd like to stop smoking, but I'm afraid I won't be able to because my weight is dropping so quickly. I began smoking about 6-7 years ago and continued to do so on a daily basis. I began while I was depressed, and it made me feel so good that I continued doing it indefinitely. I'm not sure how to deal with my feelings and the realities of life. It's time to give up and start learning what I should have learnt seven years ago.
  - One day, I took a substance that burnt my eyes and made them water, thinking it was cocaine. But it didn't hurt. What I did and what I've been consuming for the past 14 days is meth, I now know. For a long time, I can feel the impacts. My mouth will be so dry that it will feel as if I don't feel anything or have no feeling; I'll be up for 24 hours or more and unable to sleep despite taking Benadryl. To be honest, I don't mind doing meth, but being depressed makes me feel horrible about myself and helps me recognize what's genuine. My guy is hooked to a variety of substances. I want to be there for him and assist him when or if he decides to recover, but I can't since I'm also addicted…
  - When you take something on a daily basis for a long time and then stop, you will experience withdrawal symptoms, which are both physical and psychological. I used to work in a coffee shop, and because to COVID and lockdown, I couldn't drink espresso, which I used to consume several times a day. I had an odd withdrawal, not as bad as other substances, but it was strange, like you miss something. I'm not sure what I'm talking about, but you know what I mean. Marijuana has never caused me to experience withdrawal symptoms, but the overall habit has a strong impact on your stomach throughout the day. Furthermore, if you smoke with companions outside, you will be able to avoid this. Stopping using it can make you feel even more isolated.
  - hey.. for about 2 months, I used to smoke pot every day, but now I only had one joint a day. It makes me ill, but I have to take it. I had withdrawal symptoms such as a loss of appetite, nausea, nighttime sweats, and weird nightmares. Is it possible to estimate when the symptoms will be gone? Should you quit cold turkey or gradually reduce your intake? It's just been two months since I started smoking it. It's amazing at first, but it quickly becomes unpleasant, and the taste makes me sick.
  - AND GOT HIGH AND GOT HIGH AND GOT HIGH
  - It's so bizarre! I used to smoke every day for approximately 6 months, and after smoking one day around 7 months ago, I experienced severe mental health difficulties; I tried again a week later, and it happened again and again. I took a month off, tried again, and it occurred again. So I've given up totally and haven't done it in over a year, and I'm not going to do it again.
  - I've been smoking pot since I was a teenager, starting in the midst of my freshman year of college and stopping recently. I've always fantasized of getting high on marijuana. My life is so much more pleasurable now that I'm free of marijuana. I understand that weed may be beneficial to certain people, but it was not for me. I've had severe mental health concerns as a result of it, and it's made my life a living hell.
  - Others said it was impossible when I said there was withdrawal. This was a good ** years ago when I stopped using weed, and I'm sure there was a withdrawal period. Lack of sleep, bad mood, and hunger are the most common mental health issues. However, there are no physical side effects. But it's possible that's because it's better than the other substances I've given up….

  - For me, cannabis withdrawal resulted in a loss of appetite, a sensation of malaise, a lack of energy, and a high level of emotionality. The major issue is that no one can relate to it, although all of these withdrawals have some advantages. Fasting without food is beneficial to your health. Working on oneself isn't entirely terrible; it just feels bad, is extremely boring, and makes you sick.
  - This was not the first time it had happened to me. My emotions are depressed by night sweats, intense dreams, and being hot all the time. My reality was dreadful for about a week. I smoked to stay sober, so I was still high when I quit, but my body is still getting used to not smoking.
- Top 5: Showing love, blessing, or encouragement to the person in the video.
  - 💕💕💕💕💕💕💕💕💕💕💕💕💕💕💕💕💕💕💕💕💕💕💕💕💕💕💕WE BELIEVE💕💕💕💕💕💕💕💕💕💕IN YOU 💕💕💕💕💕💕💕💕💕💕V***💕💕💕💕💕💕 💕💕💕💕💕💕💕💕💕💕💕💕💕
  - ✨🌟✨🌟✨🤍✨🌟✨🌟✨🌟✨🌟V*** 🌟✨🌟✨✨🌟hope u get sober🌟✨🌟✨🌟✨🤍🌟 ✨🌟✨✨🌟
  - M*** i know you were under the weather, i hope you stay in good health .... but i hope she stays sober she looks tired and her poor arms 🥺😬...i hope she is taking care of them but cheer up my girl 💅🏽💅🏽💅🏽...and the interview is great 🌟👏🏽👏🏽👏🏽
  - ✨🌟✨🌟✨🌟✨🌟✨🌟✨🌟✨🌟C***🌟✨🌟✨🌟✨🌟✨🌟✨🌟✨🌟✨🌟✨
  - ✨💖✨💖🥺💖✨💖✨💖✨💖 RIP 💖✨💖✨✨💖✨💖✨💖✨💖✨💖
  - M***'s I see the tragedy when looking at you…I bless you, I hope you get clean and treat your teeth…god bless you.🤍🤍👉🏾💖😍🤍😇💅🏽 💅🏽😇💅🏽😇💅🏽😇💅🏽🤦🏾‍♂️🤦🏾‍♂️😇💅🏽
  - His hearts lonely an lost…. I pray he can improve his life also.. He is a good person…. I hope you stay in the light an find love in ur light.. Don't let the bad out there keep your kindness… dont ever let ur light go out
  - You deserve of all great things in your life! Please kee up! You just have to let it go and love and the blessings will come to you. It's difficult but I know you will make it. I BELIEVE IN YOU! God bless you 💅🏽💅🏽💅🏽💅🏽🤍🤍🤍🤍🤍 much love from Texas 🤚🏽
  - Love you R*** God bless💅🏽💅🏽💅🏽💅🏽💅🏽💅🏽
  - I believe you and I believe in you ❤️ I'm so sorry you are experiencing this . You didn't deserve any of this . Love yourself honey , give yourself the love you need It's never too late to change and start a new life. You deserve so much more ❤️ You need a safe place to take a break, and I can see you will get better. Sending you abundance of love and prayers.
- Topic 6: Information related to drugs, medicines, or treatments.
  - I'd want to explain how a scam works. First, they offer you a phony "health insurance" policy that claims to cover all medical procedures you require. But, of course, that would not be cheap, and the CEO would spend your money on yachts. So, if you get hurt (or old) and need knee or back surgery, they put you on pain pills instead of surgery whenever feasible. The ruse is that they put you on extremely powerful and addictive painkillers. You lose your job if you become addicted to opioids, and you lose your insurance if you lose your job. In addition, your insurance company is unconcerned with your knee or back problems. You won't be able to receive prescribed painkillers, and since you didn't undergo knee surgery, you'll have to get herion on the street and risk dying from a fentanyl overdose. And that is how insurance corporations profit from our healthcare system without ever giving any therapy.
  - All drugs are now legal in Oregon. People refuse to acknowledge that drug addicts are not criminals. They are alcoholics and addicts. Those who criticize them may be addicted to something they are unaware of in their lives. Persons who condemn people with suicide thoughts or depression have most certainly never been in any of those situations. WE REQUIRE MEDICAL ATTENTION. JAIL IS NOT AN OPTION. JAIL MAKES ADDICTION EVEN WORSE. Oregon has finally grasped this, and I hope the public recognizes that this is the appropriate path to take in order to address the opioid issue. Humans are creatures of habit, and their brains are no exception. We feel rewarded when we maintain routines using dopamine. Brains prefer to be "organized," but the concept of that word is getting increasingly ambiguous by certain persons in that addiction. Oregon did a fantastic job. Hopefully, we will be able to start making a difference.
  - Doctors rarely prescribe opioids in Germany since we are one of the few nations where metamizole, the active component, is still available. After a tonsil procedure, a buddy from the United Kingdom received narcotics for pain relief, whereas I received metamizole. The active ingredient is a very strong pain and fever reliever, not an opioid, but it can cause agranulocytosis as a major side effect in rare situations; yet, the risk is accepted here. And, sadly, when opioids are prescribed, they are done so without sufficient monitoring. After a life-threatening procedure, my mother was put on Tillidine. Months later, the doctor refused to lower the amount because she "couldn't take the pain" and should "trust his experience." She nagged the doctor until she phased it off over time, despite my pleading and begging. She is currently undergoing pain management and has been prescribed a non-opioid pain reliever, with which she is very satisfied.

  - People don't often understand the resources required to successfully wean someone off opiates or heroin if that individual is willing. So much so that the phrase "simply send them to rehab" is still used. Not to mention that simply having a poor day can result in a high likelihood of relapse. If the person is UNWILLING but still wants to get better, the resources are quickly multiplied by the number needed to aid someone who is ready to quit. People don't often understand the resources required to successfully wean someone off opiates or heroin if that individual is willing. So much so that the phrase "simply send them to rehab" is still used. Not to mention that simply having a poor day can result in a high likelihood of relapse. If the person is UNWILLING but still wants to get better, the resources are quickly multiplied by the number needed to aid someone who is ready to quit.
  - There are a few items for pharmacology students to consider, but they are unimportant to laypeople. Although Xanax is not an opioid, it is used as an example at 548. A benzodiazepine is Xanax (alprazolam). Opioids/opiates can also inhibit the medulla oblongata's functions and alter the levels of other neurotransmitters such as dopamine and norepinephrine (noradrenaline), but they do not bind to or impact the levels of those receptors. They only affect and bind mu, kappa, and delta receptors for opiates and endorphins. Only norepinephrine and andrenergic medications bind to norephinephrine receptors in the brain, and only dopamine while dopaminergic drugs attach to dopamine receptors. Tolerance and accidental overdose are linked to opioid receptors and liver metabolic enzyme levels, not to adrenergic receptor levels. Finally, in the medical world, the terms opioid and opiate are now interchangeable, as the difference between natural and synthetic substances is not clinically significant.
  - 716… Methadone DOES have psychotropic effects, as I can personally attest. They aren't as potent or quick as other opiates since they take longer to kick in, but once they do, they give you the same opiate "glow" and warmth in your body. That's why so many people move from Suboxone to Methadone: Suboxone isn't strong enough and doesn't provide the same warm feeling as Methadone. This is the most common misconception regarding Methadone that I hear from people: "it does nothing but keep you out of withdrawal." Sorry, but if that were the truth, Methadone wouldn't work nearly as well as it does now.
  - I'm on Suboxone and it's relatively easy to get in my state; you can literally call any addiction doctor or hospital (which is easy to find, just Google it) and sign up with them, and they'll ask you to take a drug test to ensure that you were actually using before they prescribe it to you; I don't want to prescribe it to people who claim to be addicts when they aren't, and if you do have opiates in your system, they'll tell you. It has a lot of potential to benefit people, but talk to your doctor about it!
  - Heroin addiction is a nightmare. You may be fine for the month with all of your bills and everything, but your mind convinces you that skipping out on the necessities is acceptable. You'll put your rent money, food money, and so on to good use. "I'll find a way to replace this money before rent." To obtain money, you'll sell everything you own and then start stealing. Then you're screwed when it comes to paying your bills. I'm glad I got away. Suboxone is highly recommended for anyone in this circumstance. Methadone is not one of them.
  - But, really, come on. It isn't the pharmaceutical companies, but they are to blame for exacerbating the situation by allowing it to happen in the first place. Why are we DRIVEN to use these substances in the first place? We're just fooling around with the medical cabinet, aren't we? Perhaps. Perhaps. I know I did, and I was addicted for the next ten years. But why did I want to get so stoned to begin with? or who knows. Maybe I'm completely incorrect about this. Perhaps the simultaneous development, rise, and domination of the internet and Big Pharma's trademark. Opioid methods are just a big fluke.
  - For ten years, the medical community had me on painkillers! The dosages were awful! I've been on suboxone for a while and am gradually weaning off of it. It was the best decision I've ever made. Pain is a lot easier to deal with than narcotic addiction! Enroll in a program. Outpatient treatment can be effective, as it has been for me. I was able to reclaim my life! Opioids are a disgusting substance. When you take them for an extended period of time, your brain produces more pain than it should. It is so desperate for opioids and dopamine that it is willing to suffer in order to obtain them. You can, however, reverse the situation. You have the ability to improve! And you won't damage anyone or yourself any longer. Please seek assistance!
- Topic 7: Opinions on the governmental or societal responsibilities.
  - Why do they come into being? Stop producing people who no one cares about…..the it's epitome of child abuse, which then becomes a societal issue, which you then blame on Western culture…..these people should know enough to take responsibility for their own race, culture, and society, and when they don't, as they clearly haven't, they look for other people to blame. That is the true global issue: irresponsibility. Don't bring people into the world that you can't support….that is the crime.
  - I believe she became homeless as a result of her parents' rejection of her when she came out, perhaps they kicked her out or disowned her, which is why she claims they died after she was born and she doesn't want to bring them up because the people she needed the most disappointed her, so now she's trying to live the life she imagined for herself as "R***," where she believes she's free and fashionable and so happy, and she uses drugs to cope and block out reality 🤷 Maybe I'm mistaken, but it's depressing to watch.

- It would be a poor idea for folks in red and blue states to vote for Hillary, because Trump needs to win not just the electoral college this time, but also the popular vote, in order to put an end to the leftist lunacy they've planned for any scenario other than a clear Biden victory. The one scenario they haven't openly simulated is a Trump victory in the popular vote.
- The way you've handled this is quite admirable, and it demonstrates that you're both wonderful people. It's terrible because I recall seeing comments blaming N*** and you, and knowing the real reason for your breakup must have been difficult to read. Just another lesson to not pass judgment and to say nothing pleasant if you don't have anything nice to say. I hope you're feeling better and happy now. xx
- How are we ever going to be able to avoid having a two-party system? Not doing so is against human nature. When was the last time a one-on-one war didn't finish with two sides joining forces against the strongest? How many sports have a 1vs1vs1 format? Aside from that, how can anyone achieve 270 with three people in a tight race? Even if one outruns the other two by a large enough margin to win, the other two will either merge into one party the next time around or hand the election to the third candidate. The natural form of government is a two-party system.
- You can see he's a kind guy… all he needs now is some support, assistance, and love… THERAPY. We all require those items; but, some of us have the resources while others do not, which is why the world is so unfair. Although we cannot choose our family, THE GOVERNMENT MUST PROVIDE RESOURCES FOR THOSE WITH BAD PARENTS. The foundations on which this world is created are incorrect.
- This is a human existence issue, not a Zimbabwe issue. If you're poor and have no possibilities in life, drugs may seem like the only way to stay sane. They would not be in this condition if they had opportunities to improve their life. It's unfortunate, but this is a global problem, and local and foreign governments should do all possible to assist these people.
- I'm from a third-world nation, and believe me when I say that being poor and addicted in America is far better than anywhere else. With that said, the resources are available to you young guy; just keep battling; it won't be easy; in fact, it will most likely be the most difficult thing you've ever done, but you can do it… Fight!!
- I'm from H***, West Virginia, and my mother's wisest option was to take us out of the state. Most of our relatives who still live in West Virginia deal with addiction. In our bloodline, there are relatively few success stories. Obviously, there are temptations everywhere, but the ability to make a decent livelihood has a significant impact. I believe it has an impact on your young development because you begin to feel helpless without the prospect of growth and opportunity.
- It is not true that officers kill African-Americans. A large number of white persons are slain by officers in the United States. One bad officer does not imply that all cops are bad. After all, who would you call 911 and who would come over cops if you were in trouble?

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