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### Understanding the Significance of Virtual Support During Global Pandemic in Young Adults Diagnosed with Hepatitis C

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Understanding the Significance of Virtual Support During Global Pandemic in Young Adults

Diagnosed with Hepatitis C

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### Abstract

Hepatitis C is a viral infection that attacks the liver and leads to inflammation. In recent years, the prevalence of hepatitis C infections among 20 and 30 years of age has increased by 300 percent, and between 30 and 39 years by 400 percent. Due to the global coronavirus pandemic, people diagnosed with Hepatitis C have lost access to mental health services and resources, including in-person meetings with support groups. Since most states enforced stay-at-home order, many community centers, non-profit organizations that work with Hepatitis C patients and the affected population provide limited to no access to support group meetings in person. This project presents data analysis for the prospects of how young adults diagnosed with Hepatitis C can get virtual support as a substitute for in-person support groups. An online survey questionnaire was created for the quantitative and qualitative data to determine the needs of Hepatitis C patients in times of COVID-19 pandemic. There were a total of 29 responses where only eight participants were qualified for the project's purpose. 50% of all participants had elevated anxiety, felt isolated or depressed and found it hard to maintain their lifestyles due to the ongoing global pandemic. 50% of participants said they would become members of a virtual community support group. 75% of participants said they would use an encrypted anonymous messaging app for support if one was available. This project provided an excellent insight into the lack of virtual support for young adults diagnosed with Hepatitis C, the need for more information about risk management, and the overall need for disaster preparedness guidelines.

*Keywords: Hepatitis C, COVID-19, global pandemic, support groups, anxiety, social media, young adults, HCV, anxiety, depression*

## Introduction

Due to the global coronavirus (COVID-19) pandemic, many people diagnosed with Hepatitis C lost access to educational and mental health support resources, especially newly diagnosed patients. Among viral hepatitis with parenteral transmission infectious disease and nowadays also COVID-19, Hepatitis C is still a significant public health problem. Currently, it is closely connected with the global pandemic, especially for young adults aged 18-34. During this time, it is hard to be in touch with healthcare providers, other patients, critical resources, and get support from others.

The number of individuals who need support is increasing due to the global spread of infection, a high incidence rate, and a tendency to form chronic forms of infection, leading to cirrhosis and primary liver cancer. Hepatitis C virus (HCV) can infect many organs and tissues of a person. At the same time, there is still no vaccine against this infection in practical health care, and the medicinal preparations used today are still ineffective, expensive, and potentially harmful to human health. There have been psychosocial effects on the population overall due to mass hysteria, financial loss, and economic burdens during the COVID-19 pandemic. The mental health of Hepatitis C patients has already been under the stress of coping with chronic illness.

Hepatitis C is one of the diseases with a global impact, with a prevalence of over 70 million cases worldwide (Buller-Taylor et al., 2018). Since 2010 HCV has tripled more than threefold, primarily due to increased opioid use and other injectable medications. If patients are to cope with viral hepatitis infection, they have to psychologically adapt to their condition, face stigma, and seek social support (Silberbogen et al., 2009). Stigma can result from community-driven attitudes, social hierarchy, and ignorance (Henderson & Kawakami, 2018). There

remains an urgent need to monitor infection and develop new methods of diagnosis, treatment, and prevention of Hepatitis C. However, it is hard for young adults to go through this process because of the current situation in the world.

Coronavirus pandemic enforced the stay-at-home order, which caused the facilities' closure: community centers, non-profit organizations that work with Hepatitis C patients, and the affected population. This project presents data analysis on the prospects for the intervention development and introduction of how young adults can get virtual support for their coping needs with chronic disease.

## Background

Hepatitis C virus, also is known as HCV, is the viral infection previously known as non-A and non-B viral hepatitis (NANBH) that dates back to 1989 when it was first discovered after numerous studies between 1982 and 1988 by British scientist Michael Houghton along with his co-founders Qui-Lim Choo, George Kuo, and Daniel W. Bradley (Houghton, 2009). The virus induces inflammation of the liver and causes damage, and over many years or decades, it can lead to serious liver complications, including cirrhosis, cancer, and liver failure, requiring a transplant. HCV develops in two forms: acute and chronic, which is determined by the duration of the condition. Acute HCV is considered an early stage when the patient suffers short-term inflammation with symptoms lasting up to six months. The organism is likely to repel the infection; however, up to 85 percent of people diagnosed with hepatitis C will eventually develop the disease's chronic form (WHO, 2020). Chronic Hepatitis C is an interminable infection that may result in other serious health problems, including liver failure, liver cancer, cirrhosis, and even death. The infection spreads when the blood of an HCV-infected person enters the bloodstream of a non-infected person. The most common cause of exposure and transmission of HCV comes from the sharing of needles, syringes, and other paraphernalia used for injected substance use. Other causes include but are not limited to sharing personal items such as razors, toothbrushes, and other items that may have come in contact with infected blood/open wounds/sores, unsafe intercourse, and unregulated tattoos without adequate sterilization of tools.

As shown in the Morbidity and Mortality Weekly Report, the CDC reported 3,621 cases of acute hepatitis C in 2018, approximately 50,300 new cases after data adjustments (Schillie et al., 2020). The number of new infections has increased by about 300% among people aged 20 to

29 and about 400% among people aged 30 to 39 (Schillie et al., 2020). In comparison, the CDC reported 137,713 new HCV cases in the same year, of which 36.5% represented the millennial generation, born between 1981 and 1996 (Ryerson et al., 2020). These results support new CDC guidelines that all adults 18 years of age and older, not just baby boomers, should be screened for HCV at least once. People of all ages should be diagnosed if they are at higher risk of hepatitis C infection, and current "at risk" populations such as drug users, prisoners, and migrants should be regularly tested as well.

World Hepatitis Day is held on July 28th annually to increase awareness of viral hepatitis that can cause liver disease and trigger a number of health issues. During the recent celebration of World Hepatitis Day, the World Health Organization (WHO) introduced several resources to minimize diagnostic and care expenses for viral hepatitis and asserted the need to increase funds to eradicate the disease. A recent WHO report also showed that spending US\$6 billion a year in hepatitis elimination programs in 67 low- and middle-income nations would prevent 4.5 million premature deaths by 2030, and over 26 million deaths beyond that year (WHO, 2020). Many people do not have access to prevention, testing, and treatment services. In such situation 325 million people estimated to be living with Hepatitis B and C:

- of the 71 million people who were estimated to have chronic hepatitis C in 2015;
- in the same year, there were 23.7 new HCV infections per 100,000 people worldwide;
- 15% (2 million people) of those diagnosed were treated in the same year. In total, in the period from 2014 to 2017, 5 million people have been treated for hepatitis C;
- in 2017, only 19% (13.1 million people) knew the status of their infection;
- about 2.9 million people with HIV have Hepatitis C co-infection



In the United States, nearly 2.4 million individuals suffer from chronic hepatitis C virus, and about 40% of them do not know whether they are infected (Ryerson et al., 2020). Kowalska et al. (2018) study results indicate that most patients have no knowledge about their condition and how to cope with it even when having conversations with their doctors or browsing information on the internet.

The virus had a significant impact in the United States, which, before 1992, had no way of testing the blood supply for HCV. This prompted the Centers for Disease Control and Prevention (CDC) along with the U.S. Preventive Services Task Force to recommend that everyone born between 1945 and 1965 should be tested for hepatitis C (Matthews, 2017). These circumstances resulted in Hepatitis C being labeled a baby boomer disease. However, since 2010 hepatitis C infections have tripled more than threefold. Today, HCV is relatively easy to treat with direct-acting antiviral drugs, so it is crucial for people living with the virus to know their status so that they can receive timely help and treatment.

Along with additional testing and treatment for Hepatitis C, the CDC recommends extended prevention services, including harm reduction programs for people with drug addiction (CDC, 2020). In states like California, which suffer from rampant substance abuse, HCV exposure is primarily due to increased spread of opioid use and other medication injections, directly related to the increased infection rate amongst generation Z and millennials. As a result, HCV is a heavily stigmatized disease for being strongly associated with scrutinized behaviors such as homosexuality and drugs' intravenous use. Due to the fact that a large number of patients have a history with intravenous drug use, they are often perceived as reckless, unaccountable, and avoided by society. Studies have shown that having a positive Hepatitis C diagnosis can have a detrimental effect on the physical condition and dramatically affects the patient's mental

health and quality of life (Marinho, R. T., & Barreira, 2013). Stigma is heavily influenced by community-driven attitudes, social hierarchy, and ignorance due to the general lack of understanding (Henderson & Kawakami, 2018). Attributable to the fact that HCV is also a blood-borne disease, it is commonly associated with HIV, which is a condemning factor for a patient's social standing. Acknowledgment of this stigma surrounding the disease is a significant contribution to the rise of anxiety, panic, and depression amongst patients causing mental health problems that often develop in those with chronic HCV. If patients are to cope with HCV, they have to psychologically adapt to the needs of their condition, face stigma, and seek social support (Silberbogen et al., 2009).

### **Existing methods/interventions for healthcare professionals**

There are several ways for healthcare professionals to help patients. They are very different since some may include just psychological areas, and others are more related to medications. Both adults and children with persistent HCV infection should be tested to assess if antiviral treatment is recommended. The WHO recommends offering treatment to all people over 12 years of age to diagnose Hepatitis C, regardless of the stage of the disease (WHO, 2020).

The analysis of literature data on changes in patients' psycho-emotional status with chronic viral hepatitis shows that it is imperative for the patients to stay connected with healthcare providers, especially during the global pandemic. Shifts in mental state indicators have been demonstrated in patients with chronic hepatitis B and C, while the severity of the disorders depends on the disease's clinical, laboratory, and morphological characteristics (Boscarino et al., 2015).

### **Communication**

Information about the observed signs of socio-psychological maladjustment, an increase in the level of anxiety, and symptoms of depression in patients with chronic hepatitis are presented. Applequist et al. (2020) concluded that it is essential to communicate better with patients through information sharing infographics, and positive emotional messages in order to get a better level of support. The importance of timely diagnosis and correction of mental disorders in patients with chronic hepatitis was confirmed, as well as the need to study individual characteristics and mental abnormalities that can act as factors provoking risky behavior in this category of patients (Applequist et al., 2020).

### **Knowledge gaps**

Lower levels of engagement in HCV care, which contribute to HCV-related morbidity and mortality, are associated with Hepatitis C knowledge gaps. Those may be exacerbated because of the fast changes in HCV treatment/care. Work-saving, timely, and convenient education is needed to reduce knowledge gaps and foster HCV care engagement. There has been developed a free, online, one-hour course for providers and patients in Canada (Buller-Taylor et al., 2018). Perceived knowledge gains were evident, with mean scores increasing 79% to over 98%, and increased capacity to educate themselves (Buller-Taylor et al., 2018). The project confirmed ongoing patient and provider HCV knowledge gaps. Knowledge gaps were significantly reduced, and providers' capacity to educate and encourage client engagement in HCV care increased.

### **Existing methods/interventions for patients**

Low rates of diagnosis and treatment for HCV infection in people who inject drugs (PWID) were shown in previous researches. The research surveyed patients and recovery center

workers to share in focus groups and one-on-one interviews for determination of the effects of the HepCATT intervention from their own point of view (Harrison et al., 2019). The goals were to check the effect of a comprehensive intervention (HepCATT) in drug and alcohol clinics. It has been determined that the introduction of a temporary mediator at drug and alcohol clinics has increased the participation of HCV-infected people who inject drugs with Hepatitis C virus care pathways, with increased uptake also of testing, referral to hepatology and initiation of treatment (Harrison et al., 2019).

### **Baby Boomers**

Another study showed that social media is a good strategy for promoting HCV testing for baby boomers. About 25% of the online study sample tested for HCV within 30 days after clicking on the Facebook post or an ad, following the website afterward (Plant et al., 2019). The plan was to make further refinements to the program based on the evaluation results and then expand the program to other geographic areas, prioritizing segments of baby boomers at the highest risk for Hepatitis C infection (Plant et al., 2019). As a result, those who have not been tested intend to get screened in the near future. It was an excellent opportunity for people to understand and evaluate their health situation's chances and risks.

### **Peer Support**

Peer support was the other experienced method that acknowledges the expertise of those living with HCV. Peer support can enable patient engagement with healthcare services, particularly for marginalized populations. The idea of peer support is the efficacy for intervention at promoting successful engagement with clinical services for chronic Hepatitis C patients (Stagg et al., 2019). There are two main peer support models: peer-driven from outside services (Community generated) and from within services (Service generated). The outcomes are

the high degree of trust between peer support workers and clients of the clinic, fears of treatment eased, and treatment participation increased (Stagg et al., 2019). Peer support may enhance the engagement of chronic HCV patients with available medical services.

### **Social Media**

Social media has contributed to connecting people from around the world, particularly on important issues affecting every individual regardless of race, gender, and age. Knowledge of Hepatitis in social media is useful in the fight against the disease. Some of the benefits may include health information on how someone can contract it, the risk factors associated with it, the testing, and treatment of chronic hepatitis, and how to live with it (Pourkarim et al., 2018). There are several ways to learn more about Hep C. Including the public health media library, image sharing, mobile and web apps, online videos, and podcasts. Doctors also recommend some social media tools, widgets, and digital media metrics, including but not limited: Facebook, Instagram, Twitter, Reddit, LinkedIn, and YouTube. There are some virtual resources available for the patients worldwide, such as webinars, publications, and assessment tools, including the guidance on monitoring, managing, diagnosing, and screening.

The main goal of Hepatitis C treatment is to eradicate the virus. If eradication is impossible, the goals of treatment are to stop or slow down inflammatory processes in the liver and prevent the disease's transition to cirrhosis or cancer. Even amid the global pandemic, people must ensure access to life-saving medications and practices against Hepatitis C.

The COVID-19 pandemic imposed the shelter-in-place orders forcing the shutdown of in-person support groups for hepatitis C patients, making it harder to communicate with healthcare professionals, family, friends, and peers. The pandemic generated a need to understand the importance of virtual support for young adults diagnosed with Hepatitis C.

### **Scope of work**

Hepatitis C has a significant influence on specific aspects of individuals' lives, and health professionals, in particular, should acknowledge this. Patients want and need better access to resources within their patient community. To reduce anxiety and other concerns in people infected with Hepatitis C during the pandemic, and to keep patients connected with their support system, it was established that online resources should be utilized. This project aims to examine the future of intervention design and demonstrate how young adults access virtual assistance for their chronic illness coping needs. It is intended for individuals living with or at risk of HCV, healthcare providers, community-based agencies delivering viral hepatitis treatment and education, as well as public health workers overseeing HCV programs.

### **California hepatitis C Task Force**

In 2003, California state had been afflicted by the HIV/AIDS crisis for nearly two decades, neglecting the cumulative number of over 600,000 cases of HVC that represented the urgency around little to none commitment from public health agencies (California Hepatitis C Task Force, 2020). There was no successful treatment, no particular medication, no immunization, and no immediate intervention from public health authorities. In March of the same year, William Remak and his devoted team formed the California Hepatitis C Task Force as a non-profit organization to tackle the people's awareness and lack of health literacy, detection, screening, monitoring, and treatment of viral Hepatitis. The non-profit is financed by academia, industry, foundations, community-based funding that funds non-profits in the community, small business funding, unrestricted funding, private donations, and serves the population in California, and it is located in Petaluma, CA.

The organization primarily collaborates with organizations and agencies that deal with viral hepatitis. The California Hepatitis C Task Force is partnering with local health officials to collaborate with community organizations and providers to establish a comprehensive approach in their communities to address the infectious disease. They provide assistance, the network for the growth of new partner groups, and improve local initiatives to provide greater access to viral hepatitis treatment. The organization takes advocacy positions that support patients and their access to treatments with passion. It also uses community assistance to facilitate policies that improve health safety and participates in legislation related to health equity for women, people of color, prison population, and homeless. They are implementing methods and strengthening current viral hepatitis prevention, learning, treatment plans, monitoring, and reporting procedures, promoting evidence-based viral hepatitis therapy.

California Hepatitis C Task Force's mission is to support the policies that eliminate obstacles to the treatment of viral Hepatitis and facilitate better practices for delivering evidence-based hepatitis treatments by raising awareness, encouraging collaborations, and mobilizing resources to enhance education, diagnosis, surveillance and documentation on viral Hepatitis.

The non-profits' primary goals are:

- development and deployment of data collection and analysis methods
- support the establishment of Hepatitis Task Forces throughout the country for public health agencies, viral hepatitis group action plans, and public education advancement
- define collective strategies to speed up the treatment of the hepatitis virus
- getting adequate healthcare for Hepatitis C patients and other comorbidity health issues
- provide adequate preventive services for people with hepatitis C and other comorbid conditions

### **Project**

The project's primary goals were to establish an online community outreach for people diagnosed with Hepatitis C with the use of the social media platform (Facebook) and to evaluate the patients' needs for virtual support and gain their feedback on existing virtual services through the needs assessment survey. The target population was young adults between 18 to 34 years of age, as there has been a threefold increase in new HCV cases in the past several years in this specific population group (Schillie et al., 2020). The initiative will also support the general public, as it would give voice to the communities involved. The outcomes expected are increased emotional support to the affected population, promotion of Hepatitis C available virtual services, and design of the new type intervention.

### **Objectives**

- During June-July 2020, discover all available resources online on hepatitis C, mental health, COVID-19, support groups online, and establish their connection with one another for the background on the health issue and design the intervention to address the target population.
- Over two and a half months period, form a well-managed and open communication online support group on Facebook for young adults with HCV diagnosis.
- By July 20th, design the needs assessment survey and share it with the members of the virtual support group on Facebook.
- By August 1st, 2020, create a safe environment where patients could speak openly without fearing stigma or their health status being revealed through continuous communication with the members of the virtual support group.
- By August 1st, 2020, create an anonymous chat where users could talk freely, without



worrying about stigma or their health status being revealed.

- By August 7th, 2020, evaluate the results from the needs assessment survey completed by the affected population.

### **Ecological model**

From the standpoint of the Ecological model, this project has a multi-level effect on the interpersonal, intrapersonal, community, and organizational levels:

- Interpersonal level includes formal and informal social networks, family, friends communication about the health issue, and its effects.
- Intrapersonal level includes one's knowledge or skills, or both and their effects on an individual's behavior patterns by providing education and resources about HCV and available treatment.
- Community level includes the setting of the available resources and social norms that help to address social isolation.
- Organizational level includes the functions of the organization to improve one's health and address regulations and stigmatization.

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design of the new type intervention.

### **Role**

My role at the California Hepatitis C Task Force was an intern. Due to the global coronavirus pandemic, I was working remotely. I completed prolonged hours of research on the information about the support groups' facilitation, establishment/management of online groups on social media platforms (Facebook, Instagram, Snapchat, Twitter, Reddit), and availability of virtual services in general. I discovered many studies and research articles online on the topics of Hepatitis C, depression, anxiety, social media, race, COVID-19, coronavirus, support groups, stigma, prevention, social inequality, and public health. I created folders and google docs to track the available mental health support resources (in-person and online). All this was covered in my deliverables: a support group for Facebook and a 12-question survey, both could easily be tailored to the organization's needs. This internship opportunity allowed me to incorporate my personal and professional goals: gain experience in the public health field, apply the knowledge I gained in the MPH program, practice study design skills, and facilitate existing intervention or create a new one.

### **Methods**

The American Liver Foundation (ALF) website has a few useful resources about the support groups in each state; however, there were only a few online support group resources available that appeared to be outdated or not working ("Support Groups," n.d.). It was then agreed upon with my preceptor that a new type of intervention - a virtual support group - was needed, especially in the times of disasters like COVID-19 pandemic and shelter-in-place orders. As my target population was young adults aged 18 to 34 diagnosed with hepatitis C, which included millennials and generation Z (Vitelar, 2019), who are deemed technologically skillful, it

was agreed that social media, particularly Facebook, would provide a significant outreach to this population group.

After thorough research of other social media platforms, I established Facebook was the best option for virtual support groups due to the platform's ability to write and share posts, discuss posts in the comments section, and share images, videos, and links to the outside resources. When a support group was created, privacy issues were addressed by placing the group page in private mode and creating questions for membership as most Hepatitis C patients prefer their health status to remain private to the general public due to the disease's stigmatization. The support group was named "Hepatitis C Young Adults Virtual Support" and has been promoted in other Facebook groups, in the comments section of various hepatitis-related public pages on Facebook and Instagram and Nextdoor website. Canva website has been used to create an image, with the California Hepatitis C Task Force logo to indicate the affiliation, as an attractive cover image for the Facebook group. Image 1 could be found in [Appendix A](#).

I reviewed and completed the instruction technologies and training for Qualtrics and watched the instructions to SurveyMonkey and Google forms to identify the survey tool that has the best application for my capstone project. After drafting several Word documents with potential survey questions, I created a survey and distributed it to different Facebook groups to get quantitative and qualitative data to evaluate young adults' needs with HCV in the global crisis and give patients a voice. It was shared with over 60 groups and public pages on Facebook with thousands of members and followers worldwide. The survey was composed of 12 questions split into three sections: demographics, patients' feelings about COVID-19 pandemic, and virtual support. Questions for the needs assessment survey could be found in [Appendix B](#).

Additionally, I wanted to utilize end-to-end encrypted messaging platforms to encourage the virtual support group members to ask questions anonymously if they are not comfortable with disclosure of their health status or worried about the stigmatization. That required prolonged hours of research on available messaging applications such as Snapchat, WhatsApp, Telegram, Facebook Messenger, Viber, GroupMe, Signal.

### **Public Health Impact**

Conducting this study has given greater insight into patients' diagnosed with Hepatitis C daily concerns during the COVID-19 pandemic. A total of 29 individuals participated in the survey, but only 8 of them qualified for the study's purpose. Tables 1, 2, and 3 contain all participants' answers to the survey and could be found in Appendixes C, D, and E. Out of 8 participants:

- 50% of the participants said they felt elevated anxiety, isolated or depressed, and it was hard to maintain their lifestyle during the pandemic (Image 2 & 3, Appendixes F & G).
- 12.5% strongly agree that there is a lack of online community support for their age group (18-34), while 62.5% agree, and 25% felt neutral about it (Image 4, Appendix H).
- 50% said they would become members of the online community for their age group if one is available, while 37.5% responded maybe, and 12.5% said no (Image 5, Appendix I).
- 75% would use an anonymous messaging app for peer support if one was available, while 12.5% of participants responded no, and the other 12.5% said maybe (Image 6, Appendix J).

The results for the open-ended question about the need for modern services/online support during the COVID-19 pandemic were as followed:

- 3 participants said they do not need anything
- 2 participants were not sure what they need
- 1 participant required more information about Hepatitis C
- 1 participant required "better guidance about risk management to avoid COVID-19"

### **Discussion**

This needs assessment was designed to explore whether young adults with HCV could navigate online support in coping with their chronic conditions. The outcomes of the survey were unexpected. Five out of eight participants stated that online support was not necessary or had no understanding of what they might need during the global pandemic. There were numerous implications for this project.

The project's Facebook group "Hepatitis C Young Adults Virtual Support" had no following within two months' time frame; thus, it was agreed upon to share the needs assessment survey with the worldwide available groups and pages on Facebook. According to the results, only 29 responses were received out of more than 60 related to Hepatitis C or liver disease private/public groups and public pages on Facebook with thousands of members; thus, it is safe to conclude this specific social media platform is not fit for this specific population. If there was available funding, marketing the support group on Snapchat, Instagram, and TikTok could have successfully reached out to the target population. Three major social media platforms are most commonly used by millennials and generation z (Vitelar, 2019):

- Instagram (<https://www.instagram.com/>) is used mostly for photo sharing, and thus lacks the community functionality needed for this project, for instance, sharing links to the information resources outside the platform.
- Snapchat (<https://www.snapchat.com/>) is only a messaging app that might be hard to facilitate as a support group; it also allows only up to 32 people in a group chat.
- TikTok (<https://www.tiktok.com/en/>) is a short-video social media platform that is lacking any features needed for this project.

All three platforms lack the anonymity required for young adults with HCV and could be a significant concern due to the disease's stigmatization. Although out of all available social

media platforms, Facebook seemed to be the best fit. It allows the members to keep the lively atmosphere in the online group by posting the questions, hosting online support groups' meetings through the events via Zoom activities, arranging online broadcast sessions with knowledgeable about the condition speakers.

More awareness about the disease must be done for future research, especially by the governmental agencies, more social marketing campaigns how it was done for baby boomers' generation. With worldwide stigmatization of the disease, there is a need for healthcare providers to show understanding of emotional stressors that could impact one's ability to cope with the disease, especially during global emergencies like the COVID-19 pandemic for patient's emotional impact. It is a necessity to provide doctors and hospitals with patient group contact information in order to help them access available online resources they might not be aware of and improve the community outreach when funding for marketing campaigns is not available.

One other possible intervention would be to develop a robust, end-to-end encrypted, anonymous messaging app for people affected by hepatitis C, where they could discuss their concerns about their condition, treatment, and other complications without worrying that their identity will be revealed to the general public. Due to the stigmatization aspects, it is essential to address patients' privacy and security concerns when the facilitation of virtual support chats is involved. That could be utilized primarily by patients as a fantastic tool for virtual peer support. A great example of an available messaging application would be Discord. Discord is a free application that could be used on the smartphone, PC, and Mac systems. The user should register with email and choose a nickname, which addresses the privacy issue for Hepatitis C patients. The California Hepatitis C Task Force or any other public health organization could implement this technology to facilitate the virtual support chat. In order to use Discord, the facilitator will

need to start an invite-only Discord server that can be tailored with differently themed/hash tagged text channels, including video and voice call channels. This technology may fulfill the needs of coping resources in young adults between 18 and 34 who have been diagnosed with HCV.



### **Conclusion**

The national population has been affected mentally by mass panic, economic difficulties, and financial stress during the COVID-19 pandemic. As most states have implemented lockdowns and shelter-in-place orders, numerous healthcare facilities, and non-profit organizations dealing with hepatitis C patients do not have adequate access to in-person support group meetings. Some of the drawbacks of the COVID-19 pandemic is that no secure and confidential social networking services exist for young adults with viral hepatitis to address health conditions or coping strategies with a doctor or fellow patient. There is a need to create social networking that enables patients to have a dedicated conversation with another individual about very private issues. The project's survey analyzes the potential for young people living with Hepatitis C to pursue virtual assistance and use online services as a replacement for in-person meetings. This application of using social networking to connect medical staff to their community would be beneficial to patients who have no way to access mental health services due to the pandemic. However, this intervention needs evaluation for long-term applications, monetary support, and feedback from stakeholders, patients, and healthcare providers. Patients will require increased access to resources in the medical and patient communities to get the help they need to overcome future global disasters.

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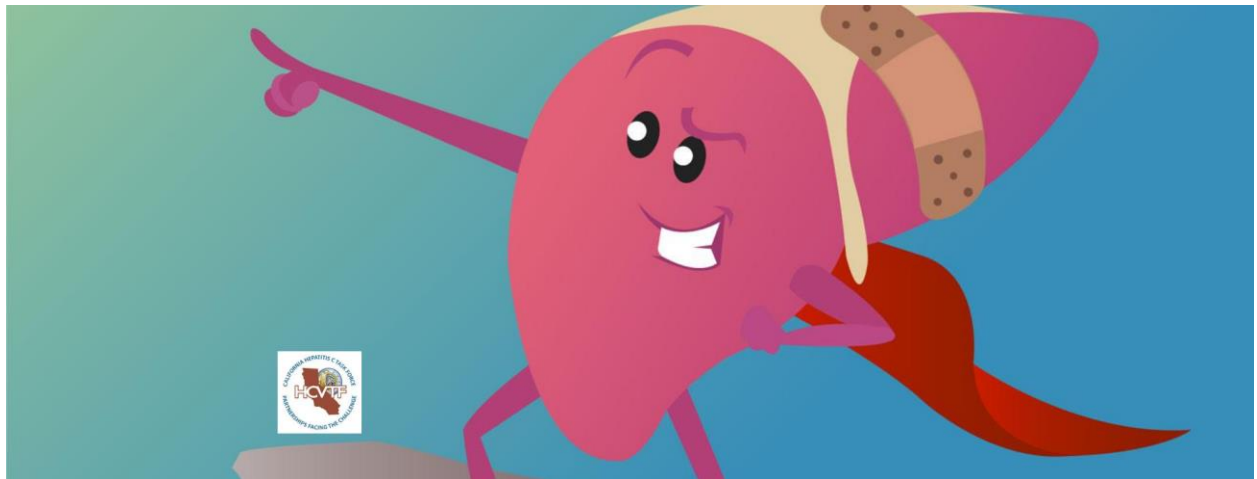
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Appendix A.

**Image 1:** Picture with the California Hepatitis C logo to indicate the affiliation of the project.



Appendix B.

The “Hepatitis C Young Adults” survey questionnaire.

## Hepatitis C Young Adults

The purpose of this survey is to assess the needs of virtual support for young adults diagnosed with Hepatitis C during the COVID-19 global pandemic.

\* Required

1. What is your age? \*

Mark only one oval.

- 18-23  
 24-29  
 29-34  
 35+

2. What is your gender? \*

Mark only one oval.

- Female  
 Male  
 I prefer not to answer

3. What is your ethnicity? (Check all that apply.) \*

Check all that apply.

- American Indian or Alaska Native  
 Arab or Middle Eastern  
 Asian  
 Black or African American  
 Latinax  
 Native Hawaiian or another Pacific Islander  
 Caucasian or European

Other:  \_\_\_\_\_

## VIRTUAL SERVICES NEED DURING GLOBAL PANDEMIC

4. Where do you live in? (country or state, if you live in the United States) \*

COVID-19 questions

Answer a few questions about your experience with the global pandemic.

5. How concerned are you about contracting the new coronavirus (COVID-19)? \*

Mark only one oval.

- Very concerned  
 Moderately concerned  
 Slightly concerned  
 Does not bother me at all

6. Do you feel isolated or depressed? \*

Mark only one oval.

- Yes  
 No  
 I prefer not to answer

7. What is the hardest part of following the stay-at-home order? (Check all that apply.) \*

Check all that apply.

- Being isolated from others  
 Increased anxiety levels  
 Working/Studying from home  
 Maintaining lifestyle (exercising, traveling, daily routine)  
Other:  \_\_\_\_\_



## VIRTUAL SERVICES NEED DURING GLOBAL PANDEMIC

### Virtual support

Answer a few questions about your needs for virtual support during the pandemic and stay-at-home order.

8. Do you believe it is important to practice self-care? \*

*Mark only one oval.*

- Yes  
 No

9. Do you believe there is a lack of online community support for Hepatitis C patients of your age group? \*

*Mark only one oval.*

- Strongly Agree  
 Agree  
 Neutral  
 Disagree  
 Strongly Disagree

10. If there was an established online community of your age group, would you become a member? (Examples: Facebook group, Instagram page, smartphone app) \*

*Mark only one oval.*

- Yes  
 No  
 Maybe

## VIRTUAL SERVICES NEED DURING GLOBAL PANDEMIC

11. If there was an anonymous messaging app to interact with other Hepatitis C patients, would you use it? \*

Mark only one oval.

- Yes  
 No  
 Maybe

12. What modern services/online support do you need during the COVID-19 global pandemic? \*

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Google Forms

Appendix C.

**Table 1:** Demographics responses to Hepatitis C Young Adults Survey.

What is your age?	What is your gender?	What is your ethnicity? (Check all that apply.)	Where do you live in? (country or state, if you live in the United States)
35+	Male	Caucasian or Europid	Illinois
35+	Female	Caucasian or Europid	Virginia
35+	Female	Caucasian or Europid	UK
35+	Male	Mixed	Arizona
24-29	Male	Asian	India
35+	Female	Caucasian or Europid	Arizona
24-29	Male	Asian	Thailand
35+	Female	Caucasian or Europid	Florida
35+	Female	Caucasian or Europid	California
35+	Female	Caucasian or Europid	Ireland
35+	Male	Caucasian or Europid	USA California
35+	Female	Caucasian or Europid	Iceland
35+	Female	Caucasian or Europid	New York
29-34	Male	Caucasian or Europid	California
35+	Female	Caucasian or Europid	New York

## VIRTUAL SERVICES NEED DURING GLOBAL PANDEMIC

29-34	Female	Caucasian or Europid	Canada
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Appendix D.

**Table 2:** Participants responses about COVID-19 questions to Hepatitis C Young Adults Survey.

How concerned are you about contracting the new coronavirus (COVID-19)?	Do you feel isolated or depressed?	What is the hardest part of following the stay-at-home order? (Check all that apply.)
Very concerned	No	People are selfish and the world is nuts.
Slightly concerned	Yes	Maintaining lifestyle (exercising, traveling, daily routine)
Very concerned	No	Being isolated from others, Increased anxiety levels
Moderately concerned	Yes	Being isolated from others
Very concerned	Yes	Increased anxiety levels
Moderately concerned	No	Maintaining lifestyle (exercising, traveling, daily routine)
Slightly concerned	No	Maintaining lifestyle (exercising, traveling, daily routine)
Very concerned	No	Maintaining lifestyle (exercising, traveling, daily routine)
Very concerned	Yes	Maintaining lifestyle (exercising,

## VIRTUAL SERVICES NEED DURING GLOBAL PANDEMIC

		traveling, daily routine)
Very concerned	No	Working/Studying from home, Maintaining lifestyle (exercising, traveling, daily routine)
Very concerned	No	Being isolated from others
Very concerned	Yes	Maintaining lifestyle (exercising, traveling, daily routine)
Slightly concerned	No	Being isolated from others
Very concerned	Yes	Being isolated from others, Increased anxiety levels
Very concerned	No	Maintaining lifestyle (exercising, traveling, daily routine)
Does not bother me at all	No	Maintaining lifestyle (exercising, traveling, daily routine)

Appendix E.

**Table 3:** Participants responses about virtual support to Hepatitis C Young Adults Survey.

Do you believe it is important to practice self-care?	Do you believe there is a lack of online community support for Hepatitis C patients of your age group?	If there was an established online community of your age group, would you become a member? (Examples: Facebook group, Instagram page, smartphone app)	If there was an anonymous messaging app to interact with other Hepatitis C patients, would you use it?	What modern services/online support do you need during the COVID-19 global pandemic?
Yes	Neutral	Maybe	Maybe	I really don't know
Yes	Neutral	Yes	Yes	Counseling
Yes	Disagree	Yes	No	I have enough online support, as I am admin for a hep C group.
Yes	Disagree	Yes	Yes	Support group
Yes	Agree	Yes	Yes	Not much
Yes	Disagree	Yes	Yes	Support group
Yes	Agree	Yes	Yes	More info on Hep C
Yes	Strongly Agree	Yes	Maybe	Telemedicine

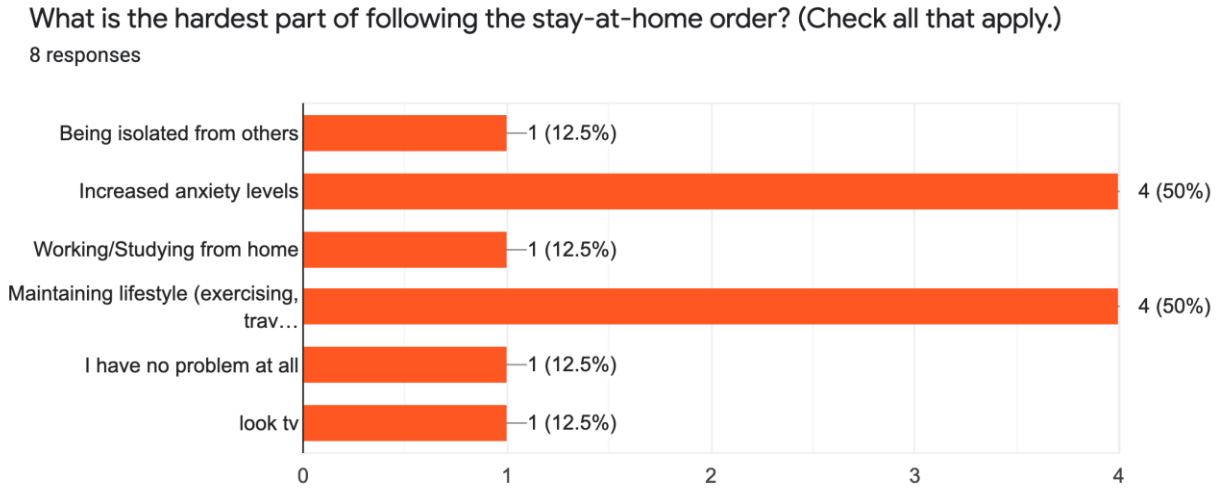
VIRTUAL SERVICES NEED DURING GLOBAL PANDEMIC

Yes	Strongly Agree	Yes	Maybe	Friends
Yes	Agree	Yes	Yes	No need
				I need a vaccine so we can begin controlling this monster! You have confused Covid 19 and Hepatitis C.???
Yes	Strongly Agree	Maybe	Yes	
Yes	Agree	Yes	Yes	None, but a facebook group
Yes	Neutral	Yes	Yes	none
				better guidance about risk management to avoid COVID19
Yes	Agree	Yes	Maybe	
Yes	Strongly Disagree	Yes	Maybe	I have a lot of support
No	Agree	No	Yes	nothing



Appendix F.

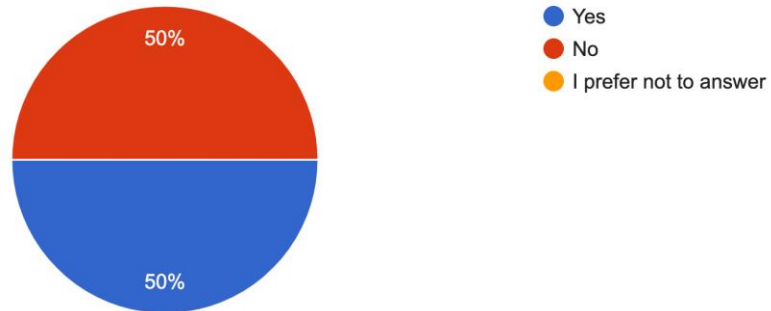
**Image 2:** Infographic of the patients' feelings about stay-at-home order.



Appendix G.

**Image 3:** Infographic of the patients' feeling isolated or depressed.

Do you feel isolated or depressed?  
8 responses

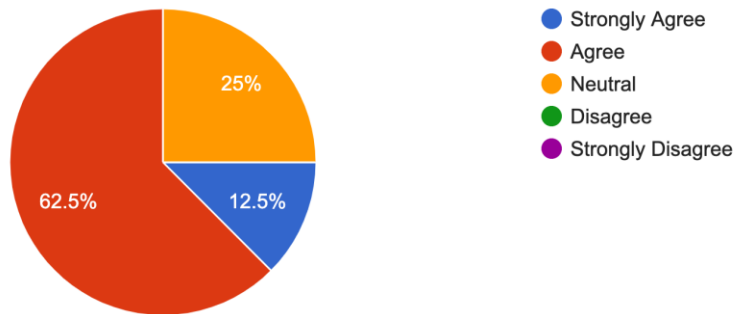


Appendix H.

**Image 4:** Infographic of the patients' feelings about the lack of online community support.

Do you believe there is a lack of online community support for Hepatitis C patients of your age group?

8 responses

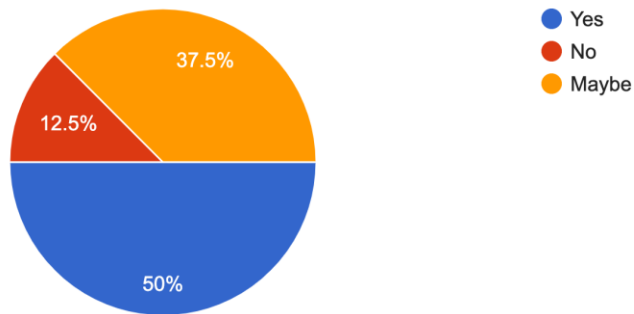


Appendix I.

**Image 5:** Infographic of the patients' feelings about joining the online community.

If there was an established online community of your age group, would you become a member?  
(Examples: Facebook group, Instagram page, smartphone app)

8 responses

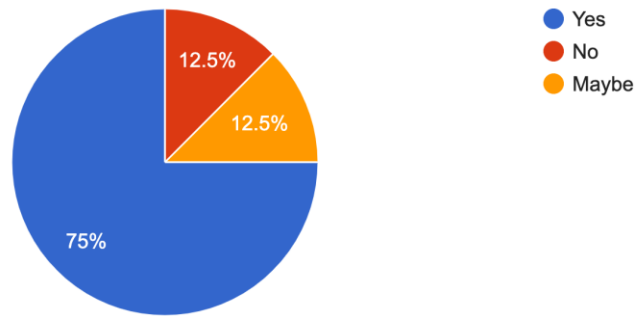


Appendix J.

**Image 6:** Infographic of the patients' feelings about utilizing the anonymous messaging app

If there was an anonymous messaging app to interact with other Hepatitis C patients, would you use it?

8 responses



MPH Program Competency Inventory

Competency	Description of How Each Was Achieved
<p>1. Assess population needs, assets, and capacities that affect communities' health</p>	<p>Completed online research on Hepatitis C Task Force organization; Hepatitis C (general info). Had frequent meetings and discussions with preceptors about Hepatitis C in young adults and its possible effects on the mental health of the patients coping with this chronic disease during the global pandemic. discovered many studies and research articles online on the topics of Hepatitis C, depression, anxiety, social media, race, COVID-19, coronavirus, support groups, stigma, prevention, social inequality, and public health. Completed hours of literature research which included the impact of social media usage for Hepatitis C patients and various ways they can get the support they need.</p>
<p>2. Design a population-based policy, program, project or intervention</p>	<p>Completed extended research on how to facilitate support groups, designed the virtual support group on Facebook considering time, trends, and</p>

	<p>the target population. Set privacy settings, created security questions for membership requests.</p> <p>Additionally, reviewed and completed the instruction technologies and training for Qualtrics.</p> <p>Watched the instructions to SurveyMonkey and Google forms to identify the survey tool that has the best application for my capstone project.</p> <p>Drafted several Word documents with potential survey questions.</p> <p>Created an online survey and distributed it to different Facebook groups to get quantitative and qualitative data to evaluate the needs of young adults with HCV during the global disaster.</p>
<p>3. Select communication strategies for different audiences and sectors</p>	<p>Created an online social media dialogue page on Instagram (had to switch to Facebook) where people diagnosed with Hepatitis C can share their experiences or resources to help other patients.</p> <p>Through online social platforms (Facebook), sent out emails and private messages to different</p>

	<p>organizations, public/private groups, and open pages on Facebook, personally contacted every admin of every group.</p>
<p>4. Apply moral, human rights, social justice, and/ or legal principles to public health practice</p>	<p>Designed and outlined an anonymous online chat room for the affected population who prefers to stay anonymous while asking questions or sharing experiences or anything else related to the disease due to confidentiality of health status (stigmatization).</p> <p>“What do you want to know but afraid of asking”</p>
<p>5. Utilize a technology-based communication format to advocate for a health policy, program, or proposal for diverse populations</p>	<p>Created an online social media dialogue page on Facebook where people diagnosed with Hepatitis C can share their experiences or resources to help other patients.</p> <p>Used the Canva website to create a fun, eye-catching cover for the project’s support group.</p> <p>Used Google Forms to design and conduct the survey.</p>