

## **Pediatric Burn Care: How Burn Camps Survived and Thrived During the Coronavirus Pandemic**

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## **Abstract**

Burn camps play a vital role in the recovery of burn survivors by allowing them to develop the confidence and skill sets needed to reintegrate back into society. During the COVID-19 pandemic, burn camps across the United States and Canada could not hold any in-person activities. They had to either pause burn camps or quickly adapt to a virtual online platform. A 37-item electronic survey was developed and emailed to burn camp directors in the United States and Canada to determine what adaptations were necessary during the pandemic. This survey allowed directors to provide details on many facets such as camp format, successes observed, and challenges encountered. Twenty-one of 34 (62%) burn camp organizations completed the survey. 13 of the 21 (62%) respondents held virtual burn camps in 2020 while everyone else canceled their camps in 2020. The mean number of camps offered per organization decreased from 6.3 in 2019 to 4.7 in 2020. The average number of burn survivors and family members participating also dropped in that same period (2019 aggregate mean = 229.2 vs. 2020 aggregate mean = 151.4). Components of virtual camp included video conferencing platforms, “camp in a box” activities, and some prerecorded sessions. Most camp directors believed that their campers were satisfied with the virtual format. Factors allowing for a successful virtual camp included an effective online platform, scheduling adequate duration of programs, and appropriate staffing levels. Most common barriers to an effective virtual camp were participant engagement, special needs/accessibility concerns, and staff effectiveness in this format. While challenging, burn camps can be held in a virtual format successfully with proper planning, staff training, and support of campers and their families.

**Key words:** *burn camps, burn care, burn treatment and recovery, pandemic response*

## Introduction

Burn camp programs are a very important part of a burn survivor's recovery. These camps bring burn survivors together to receive group counseling and to participate in recreational activities with other individuals who may have experienced similar adversity. Studies on attendance at burn camps have shown increased ability of survivors to develop meaningful relationships, buffer children from developmental disruptions and adjust to their trauma. [1] The shared experience with other survivors can aid in their recovery.[2] Burn camps are also instrumental in the lives of counselors, with positive impact their counselors' personal and professional lives. [3]

In the spring 2020, the COVID-19 pandemic had far-reaching consequences on how medical professionals cared for their patients including burn patients. The pandemic limited the ability of individuals to gather in person and therefore compelled many to turn a virtual online format to reach out to others. The burn camp community pivoted to find new and innovative ways to support burn survivor campers and their families. This was all the more essential during a time of forced isolation and uncertainty on the duration of the pandemic. It was vital more than ever that resources were made available to campers so that their recovery was not hindered. The purpose of this study was to quantify the impact that COVID-19 pandemic had on burn camps and to evaluate the experiences burn camps had in 2020 compared to 2019 in caring for their burn survivors and their families. The survey was designed to better understand what adaptations burn camp programs implemented to accommodate campers during the pandemic. The study was also intended to elicit barriers and facilitators in providing a successful burn camp experience.

## **Methods**

### *Participants*

A contact list of burn camp organizers from the following organizations was compiled: the Western Regional Alliance for Pediatric Emergency Management Burn Focus Group, International Association of Burn Camps, and International Association of Fire Fighters. The contact list contained 36 burn camp organizers from the United States and Canada.

### *Data Collection*

The burn camp organizers were contacted directly via email with an invitation to complete a survey through an online survey platform (Qualtrics, Provo, UT). The responses were anonymous; however, the burn camp organizers had the option to provide contact information for future follow-up with a report of the results of the survey.

A 37-item survey was developed by members of the Western Regional Alliance for Emergency Management (WRAP-EM) Burn Focus Group to determine what challenges burn camp programs experienced and what changes were implemented as a result of the COVID-19 pandemic. The survey was piloted among several burn camp organizers and burn care professionals prior to release to the study population. The goal of the survey was to compare pre-COVID-19 burn camp implementation, such as number of camps offered and number of participants, to burn camp implementation during 2020. The survey used multiple choice and write-in response questions to gather implementation data, barrier and facilitator data, and characteristics of the burn camps and burn camp participants.

In order to compare pre-COVID-19 and COVID-19 burn camp implementation, a series of matching questions on number of camps offered, number of burn camp participants,

and burn camp participant demographics (age, race/ethnicity and gender) were included. Study participants were asked about their use of online/virtual platforms to continue burn camps despite the pandemic, specifically what format was used (e.g. Zoom ®, “camp-in-a-box”), difference in cost compared to in-person camp activities, as well as barriers and facilitators to implementation of the virtual camps.

### *Study Approval*

This study was approved by the University of Nevada, Las Vegas School of Medicine Institutional Review Board (Protocol #1676723-1).

### *Data Analysis*

Due to the nature of the data collected, quantitative and qualitative analysis was conducted. Qualitative analysis consisted of content and thematic analysis to find themes in the write-in responses.

### **Results**

Of the 34 burn camp organizations invited to respond the survey, 21 (62%) of the contacts (burn camp directors) completed the survey. These camps largely served pediatric burn survivors with mean aggregate attendance of 104.6 campers aged 6 to 17 years compared to a mean aggregate attendance of 29.6 campers aged 18 and older in 2019. Of the twenty-one respondents, eleven had sponsorships from non-profit community groups, followed by hospitals (3 respondents) and then fire departments (2 respondents). The remainder had multiple sponsors, which included non-profit groups and hospitals. All of the respondent burn camp organizations operated in North America with 20 based in the United States and one in Canada. Over half (15 of the 21 respondents) serve campers only from the United States. The other six respondents serve campers from the US and other countries,

namely Canada and Mexico. More than half of the respondents (13 of the 21 [62%]) stated that they held virtual burn camps in 2020 while the remaining eight canceled camp due to the COVID-19 pandemic.

Referrals for potential campers came from a variety of sources including burn centers, foundations, social media, fire departments, health care providers, police and schools. About half of the respondents (10 of 21 [48%]) were either somewhat to extremely satisfied with the volume of referrals and eight (38%) respondents were somewhat to extremely dissatisfied. The remainder 3 respondents (14%) were neutral (Figure 1). There were many suggestions for improving referrals including burn centers promoting burn camps, creating a culture where burn camps are part of the usual spectrum of care, and for burn camps to have easier access to patient contact information. One suggestion was to allow burn survivors and their families to opt in to being contacted by burn camp staff members to register.

The mean number of camps offered per organization in 2020 was 4.7, down from 6.3 in 2019. The average number of campers (burn survivors and family members) participating in 2020 dropped for each age group when compared to 2019 (Table 1). The majority of participants' race/ethnicity was Non-Hispanic white (57.3%), followed by Black/African descent (17.1%), Hispanic/Latino (13.5%) (Table 2). Most of the respondents (11 of the 13) stated the race/ethnicity breakdown for their 2020 camps was no different from that of 2019 with two respondents stating that they were not certain about the changes in the racial and ethnic demographics. Fifty-three percent of the campers were male and 13 respondents stated that there was no change in gender breakdown between 2019 and 2020. (Table 3).

The majority of respondents who held camps in 2020 (11 of 13) reported that 2020 was their first year offering virtual/online camps. Multiple video conferencing platforms were used with Zoom ® being the most common one (used by 10 out of 13 respondents). Campers

received “camp-in-a-box” packages which included materials for online activities, camp swag, and memorabilia. Online learning systems such as Canvas were also used to create courses that included camp activities and pre-recorded sessions. A majority of the survey respondents (10 of the 13 respondents) stated that operating expenses were less in 2020 compared to 2019. Camps had many special populations to serve with the most common being individuals with physical challenges, those with limited access to technology, individuals with emotional challenges and families living at or below the poverty line (Figure 2).

Many of the respondents (9 of 13) reported that campers overall appeared satisfied with the virtual/online burn camp programming (Figure 3). About half of the respondents (7 of 13) reported that they intend to continue virtual/online burn camp only if the pandemic continues, and four of the respondents intend to continue offering virtual burn camp based on the success they had in offering the virtual/online camps in 2020 (Figure 4). Factors that allowed for a successful virtual burn camp included having an effective online platform, scheduling adequate duration of programs, and appropriate staffing levels. Most common barriers to an effective virtual camp identified were participant engagement, special needs/accessibility concerns, and staff effectiveness in this online format (Figure 5). Methods used to measure success included engaging burn camp participants via social media, attendance levels, obtaining informal feedback from participants, and surveys of burn survivors, family members and staff members.

The respondents stated that the most important lessons learned from this experience included: good communication is essential to keep participants engaged, camp in a box was well received and virtual platforms may need more IT support to address technical difficulties. Furthermore, respondents also mentioned virtual platforms can allow camps to connect with families and online programming can be used to connect with campers.



Those who responded recommended numerous opportunities for improvement including having campers open camp-in-a-box together, placing activity instructions in the box, and having dedicated staff for IT support. Additional recommendations included allowing more time for interaction amongst campers, gathering feedback from campers and their family, and understanding that the virtual format may not work for everyone and thus using multiple means to engage campers may be necessary.

## **Discussion**

Burn camp is an essential component in the spectrum of care of the pediatric burn patient. It started with the establishment of two camps, one in North Carolina and another in Colorado, in the early 1980s. In the decades following, there has been a rapid expansion of such camps with dozens of camps being offered in the United States and around the globe.[4] They are designed to provide pediatric burn survivors an opportunity to have a shared experience with other burn survivors of similar ages. Through this shared experience in a safe and welcoming environment, these camps are intended to foster personal development in many facets including but not limited to enhancing self-esteem, developing social skills, encouraging teamwork, coping with the stigma of a burn, having confidence in showing their burn scars and putting those scars in perspective.[5-11] It can also assist them with depression and anxiety.[12] Furthermore, it can allow them to evaluate preconceived notions of their limitations and feel a sense of normalcy.[3] Some studies have shown that adolescents who participate in burn camps develop a more positive body image and build many skills sets such as goal-setting and problem-solving abilities, increased physical activity, communication, emotional regulation, and time management skills.[13, 14]

With the COVID-19 pandemic in 2020, many activities, meetings and events had to be either cancelled or quickly adapted to an online virtual format and burn camps were no

exception. While most of the respondents did hold a virtual version of burn camp, a substantial number of organizations opted to cancel altogether. Those that did hold virtual camps offered fewer sessions in 2020 compared to 2019 and had fewer overall participants in each age group. This was also reflected by the fact that just under half of the respondents were satisfied with the volume of referrals in 2020. As a result of these factors, this pandemic deprived many young survivors the opportunity to take advantage of an activity that has shown to be extremely beneficial in their recovery and subsequent reintegration back into society.

Those that did hold virtual camps did have many successes. They were able to utilize a virtual platform such as Zoom ® to have “camp-in-a-box” packages with associated online activities. “Camp-in-a-box” feature was extremely popular and well received overall. Even though it was the first time hosting an online camp for most respondents, the directors and their staff used such platforms to create online courses and save pre-recorded teaching sessions with some success and benefit to their organizations. Most centers reported lower overhead costs which was invaluable given the economic strains put forth by the pandemic.[15] The online format did make it easier for many campers who had scheduling conflicts or limited access to transportation.

The majority of camp directors stated that the camp participants appeared satisfied with this online format. They reiterated that proper staffing levels, having a good online program, and scheduling an appropriate length of time for activities each camp day were essential in their success. Despite the perceived satisfaction, most camp directors were either unsure if they would continue this online format next year or would only do so if the pandemic continues into 2021 and beyond.

This hesitancy to move forward with an online format in the future stems from many reasons. First, it was much more difficult to stimulate participation by camp survivors in an online format versus an in-person session. This can be even more challenging for someone who at baseline might be introverted. Second, as it was the first time for many to implement an online format, the staff may not have been as prepared for facing the challenges associated with the shift to virtual programming. Many previous studies have indicated that proper training of camp counselors led to more empowered staff, attentive to positive behaviors, and reported increased confidence in abilities to handle misbehavior.[16] Training of counselors especially by a multidisciplinary staff team can also tailor the camp experience based on the needs of their campers.[17] All of these factors can enrich the overall experience for campers and staff.

Another limitation of the virtual format was the challenge of accommodating many special needs populations. For example, there were many survivors that had medical impairments, physical disabilities and/or psychological challenges. There were others who were impoverished or had limited access to technology like a computer and/or internet access. The digital divide we noticed in the survey was a microcosm of what the United States as a whole was experiencing nationwide in 2020 especially in the school system. [18,19] Exacerbating matters were limited IT support for each burn camp which made it difficult to troubleshoot any technical difficulties. For all of these reasons, the online format, while very beneficial, was less than ideal.

Our study did have certain limitations. First, a little over a third of organizations did not complete the survey. Unfortunately, we did not have any data from them to help with our analysis. Second, this is survey limited to camp directors. All of the information in the survey was derived from them and their perceptions of the entire process. It is possible the directors consulted with their counselors when completing the survey, but we cannot be certain. We

did not have the ability to have surveys sent out to all camp counselors, burn survivors who participated, and their families. Including these groups would have made the survey more comprehensive, but we did not have the contact lists for these other groups. Additionally, due to the small sample size, robust statistical analysis was not possible and this study was limited to descriptive frequencies to measure the changes between pre-COVID-19 and 2020 camp implementation.

Despite these limitations, we strongly believe that the results of our survey tell a very compelling story. There was a substantial decrease of burn camps held in 2020 due to the COVID-19 pandemic with associated inability to gather in large groups safely. Those that held burn camps had fewer participants and had to adopt an online format. If centers decide to move forward with a more permanent virtual component, there are several valuable lessons learned as a result of this survey. The “camp-in-a-box” format should continue as it was extremely popular. Staff should be trained on how to engage participants more effectively on a virtual platform. Each center should have more robust IT support to address any technical difficulties that will inevitably ensue. Frequent communication with survivors and their families is key to tailor camp to their needs. One must understand that virtual camp may not be a suitable option for some participants, especially for those of low-income households without access to a computer or the internet or those with disabilities. Moving forward, it would be reasonable to resume in person camps with proper precautions when it is deemed safe and perhaps offer a virtual camp to a select group of people. It may be possible to identify potential campers that have especially benefit from virtual camps and relationships established may be more easily maintained through virtual ongoing connection. In addition, the lower cost of virtual camps may make camps in developing or large geographic areas more feasible. The concept of a virtual survivors group may be applicable to multiple non-

burn survivor populations, such as survivors of injury, violence, etc. Clearly, additional study is warranted to explore the potential of virtual camps and survivors networks.

## **Conclusion**

Despite the many difficulties encountered during the COVID-19 pandemic, those who organized burn camps were able to pivot effectively to a virtual format to provide this necessary service to burn survivors. They were able to overcome many obstacles to provide an effective camp which will undoubtedly aid in the recovery process for participating survivors and their families. We are hopeful the results of this study can be used as a model to virtually support burn and non-burn patients in their recovery, including those who live in an environment not conducive to in-person support services.

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## References

- [1] Rimmer RB, Bay C, Kalil E, Chacon D, Esker M, Foster KN. Through the Eyes of Burn-Injured Youth - How Burn Camp Helps Survivors Thrive. *J Burn Care Res.* April 2019; 40(S1): S188.
- [2] Barr M, Marrale K, Fields A, Chrisco L. So Much More Than Just a Good Time: A Qualitative Look at a Burn Camp Experience,. *J Burn Care Res.* March 2020; 41 (S1): S120–S121
- [3] Alden NE, Hunter H, Rabbitts A, Yurt RW. Burn Camp: A Positive Experience for Volunteer Counselors. *J Burn Care Res.* Nov-Dec 2006;27(6):809-12.
- [4] Maslow GR, Lobato D. Summer camps for children with burn injuries: a literature review. *J Burn Care Res.* Sep-Oct 2010;31(5):740-9
- [5] Rimmer RB, Fornaciari GM, Foster KN, Bay CR, Wadsworth MM, Wood M, et al. Impact of a pediatric residential burn camp experience on burn survivors' perceptions of self and attitudes regarding the camp community. *J Burn Care Res* 2007;28(March–April (2)):334–41.
- [6] Gaskell SL, Cooke S, Lunke M, O'Shaughnessy J, Kazbekov M, Zajicek R. A Pan-European evaluation of residential burns camps for children and young people. *Burns* 2009;36(June (4)):511–21.
- [7] Cox ER, Call SB, Williams NR, Reeves PM. Shedding the layers: exploring the impact of the burn camp experience on adolescent campers' body image. *J Burn Care Rehabil* 2004;25(January–February (1)):141–7.

- [8] Gaskell SL. The challenge of evaluating rehabilitative activity holidays for burn-injured children: qualitative and quantitative outcome data from a burns camp over a five- year period. *Dev Neurorehab* 2007;10(April–June (2)):149–60.
- [9] Maertens K, Ponjaert-Kristoffersen I. The expectations and experiences of children attending burn camps: a qualitative study. *J Burn Care Res* 2008;29(May–June (3)):475–81.
- [10] Williams NR, Reeves PM, Cox ER, Call SB. Creating a social work link to the burn community: a research team goes to burn camp. *Soc Work Health Care* 2004;38(3):81–103.
- [11] Bakker A, Van der Heijden PG, Van Son MJ, Van de Schoot R, Van Loey NE, Impact of pediatric burn camps on participants' self esteem and body image: An empirical study. *Burns* 2011; 37(8): 1317-1325,
- [12] Tropez-Arceneaux LL, Castillo Alaniz AT, Icaza IL, Murillo EA. The Psychological Impact of First Burn Camp in Nicaragua. *J Burn Care Res* 2018; 38 (1) January-February: 1–7.
- [13] Cox ER, Call SB, Williams NR, Reeves PM. Shedding the Layers: Exploring the Impact of the Burn Camp Experience on Adolescent Campers' Body Image, *The Journal of Burn Care & Rehabilitation*, 2004; 25 (1), January-February: 141–147
- [14] Rimmer RR, Pressman MS, Takach OP, Bay RC, Croteau R, Hansen LD, Foster KN, Caruso DM. Burn-Injured Adolescents Report Gaining Multiple Developmental Benefits and Improved Life Skills as a Result of Burn Camp Attendance, *J Burn Care Res*, 2012. 33(4) July-August: 552–560.
- [15] Parker K, Minkin R, Bennett J. Economic Fallout From COVID-19 Continues To Hit Lower-Income Americans the Hardest. Pew Research Center. 2020 Sept 24.

[16] Williford DN, Jackson CB, Thomas B, Simon R, Hajduk G, Leonard L, Aballay A, Duncan CL. Behavioral Principles as Part of a Summer Pediatric Burn Camp: Implications for Practice, Counselor Training, and Important Lessons Learned, *J Burn Care Res*, 2019. 40(1) April: S110.

[17] Jackson B, Boulter T, Mikolaj K. Burn Camp Multidisciplinary Staff: Efficacy of Training. *J Burn Care Res*, 2020. 40(1). March: S215.

[18] Vogels EA, Perrin A, Rainie L, Anderson M. 53% of Americans Say the Internet Has Been Essential During the COVID-19 Outbreak. Pew Research Center. April 30, 2020.

[19] Hamilton LS, Grant D, Kaufman JH, Diliberti MK, Schwartz HL, Hunter GP, Setodji CM, Young CJ. COVID-19 and the State of K–12 Schools: Results and Technical Documentation from the Spring 2020 American Educator Panels COVID-19 Surveys.

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Average Number of Campers by Age and Camper Type (n=13 responses)	Average # of campers per camp	Average # of campers per camp
	2019	2020
Burn survivors 5 years and younger	5.3	3.2
Burn survivors 6 to 17 years old	104.6	79.5
Burn survivors 18 years and older	29.6	19.8
Family members under 17 years old	50.9	25.4
Family members 18 and older	38.8	23.5

Table 1-Comparison of average number of campers by type and age group in 2019 and 2020

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<b>Race/Ethnicity of Campers (Average Percent Reported) (n=13 responses)</b>	<b>2019 (%)</b>
Non-Hispanic White	57.3
Black/African Descent	17.1
Hispanic/Latino	13.5
Asian	3.4
American Indian/Alaskan Native/Aboriginal	1.1
Pacific Islander/Native Hawaiian	1.0
Multiracial	5.1
Not sure/Don't know	1.4

Table 2-Breakdown of race/ethnicity of campers in 2019

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<b>Gender Identity of Campers (Average Percent Reported) (n=11 responses)</b>	<b>2019 (%)</b>
Male	53.3
Female	46.3
Non-binary/Other	0.4
Not sure/Don't know	0

Table 3-Gender identity of campers in 2019

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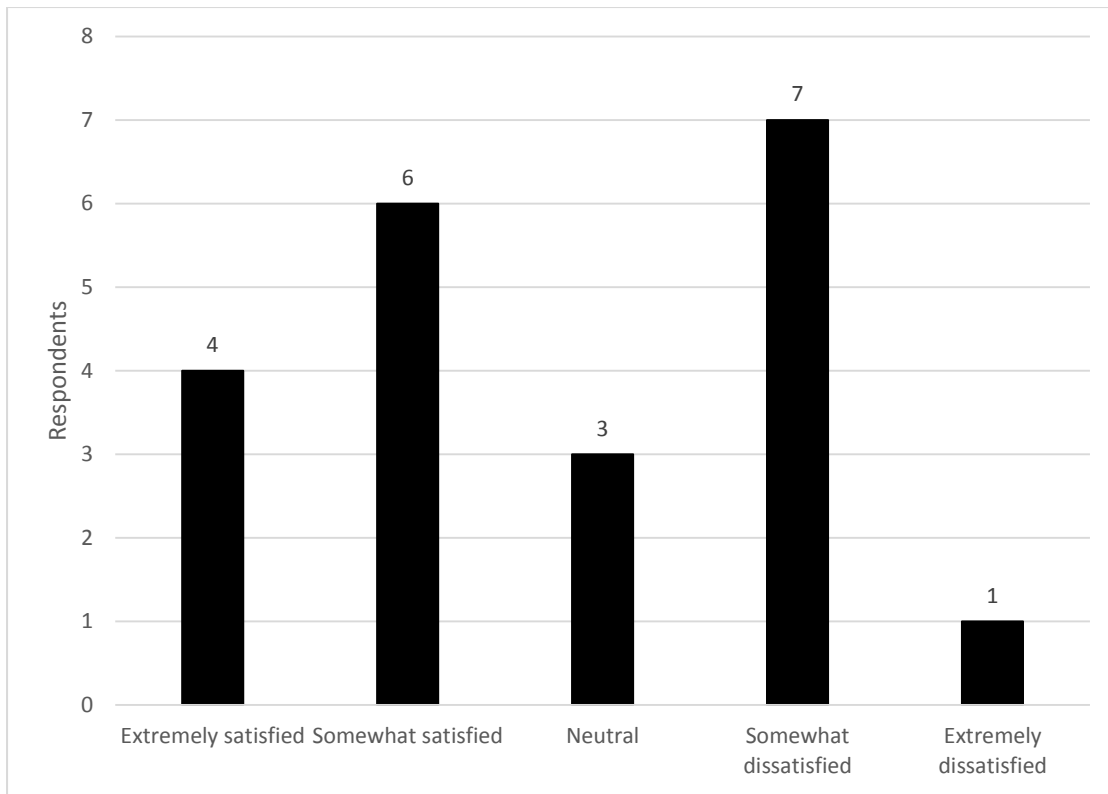


Figure 1 Burn camp director level of satisfaction with volume of referrals (n=21)

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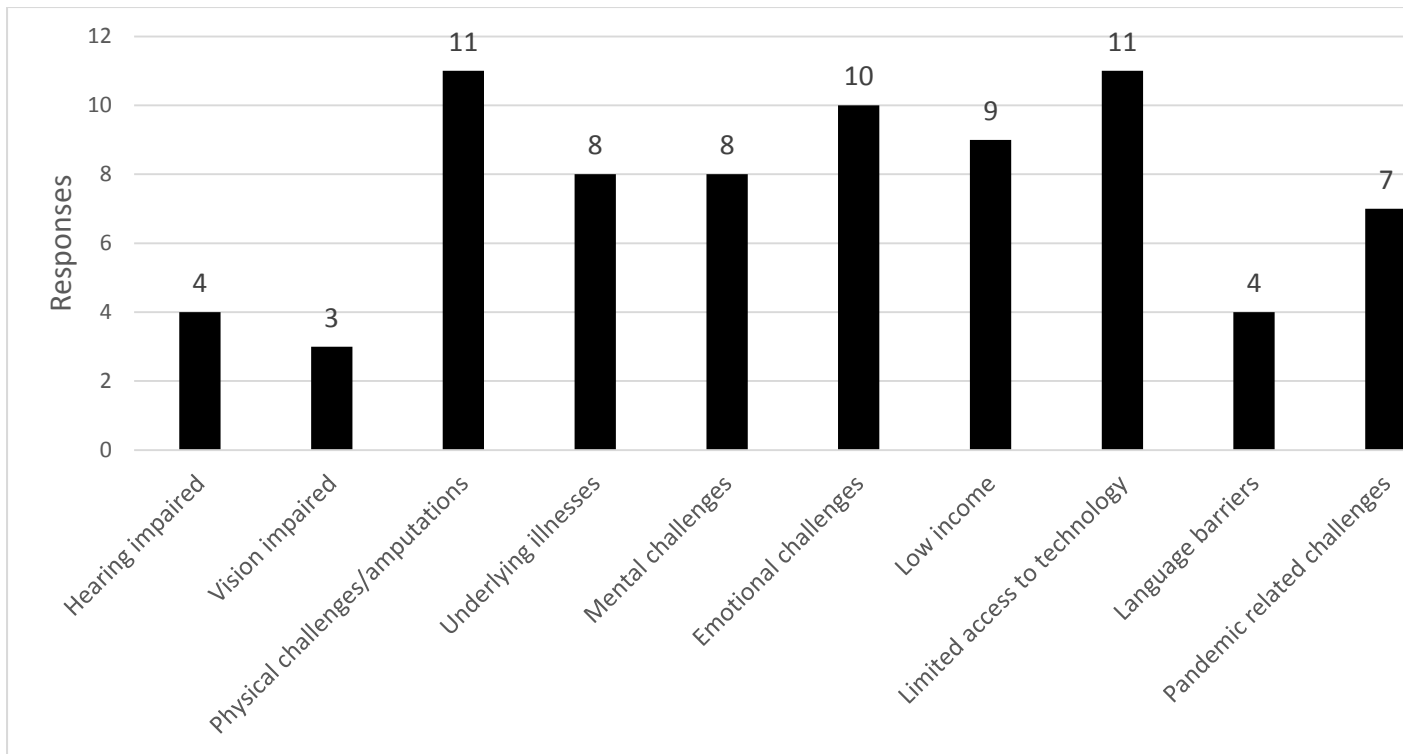


Figure 2-Special populations served by burn camps in 2020. N=13 with respondents able to select multiple groups

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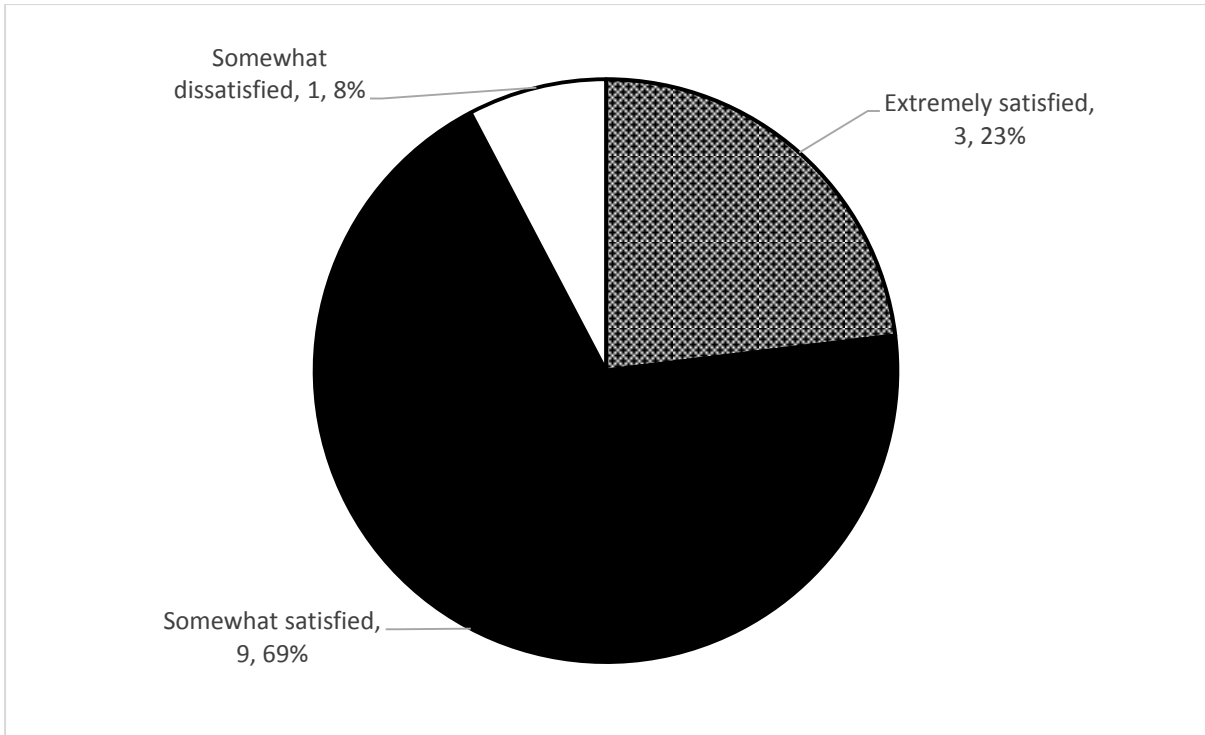


Figure 3- Camp directors' perceived camper satisfaction. N = 13

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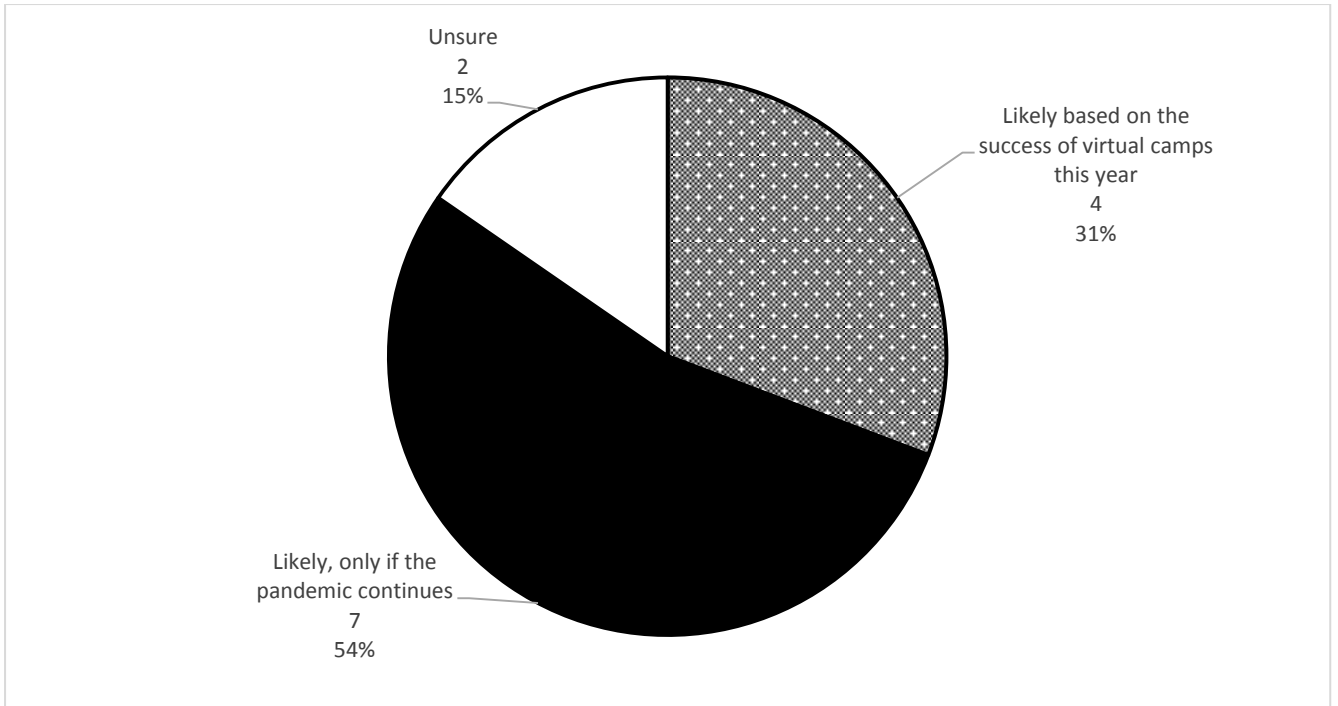


Figure 4 Camp directors' likelihood of future virtual burn camps. N =13

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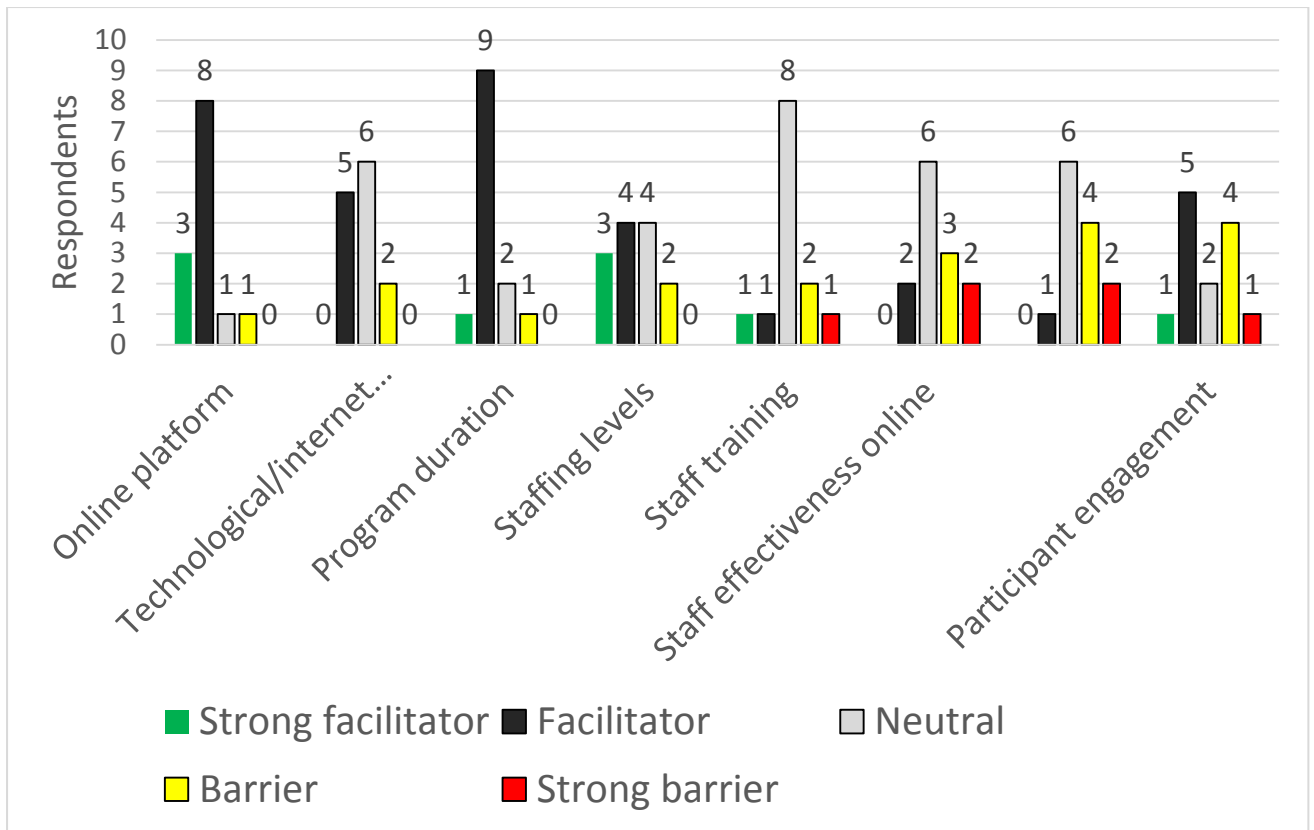


Figure 5 Perceived barriers and facilitators in implementation of virtual 2020 burn camp. N=13

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