

non-professional, peer support program for abstinence, one that is widely available throughout the USA.

NA's fellowship has reported 27,005 group meetings held in the United States on a weekly basis prior to the COVID-19 period. TS fellowships' face-to-face meetings have served to aid in members' recovery from SUDs through peer support and a sense of enhanced personal meaning, both considered important in assuring stable abstinence.¹⁰ It has been found to be supportive of recovery from SUDs,^{11,12} as has the other major Twelve Step fellowship, Alcoholics Anonymous (AA), for addictive disorders, as indicated in the available literature for alcohol use disorders in a recent Cochrane review.⁶

The operation and impact of social networks have long been studied,¹³ with potential paid to the adoption and spread of new ideas.¹⁴ More recently, the potential of virtual (online) video communication by means of programs such as Zoom has been considered relative to video conferencing¹⁵ and telehealth,¹⁶ and, in the addiction field, to the initiation of prescribing maintenance medications for opioid use disorder.¹⁷ Caution has been noted relative to its effectiveness in psychiatry, given a lack of regulatory bodies, particularly for non-professional personnel where established medical resources are limited, as is in the case of SUDs.¹⁸ This would include parties such as counselors in countries with limited professional resources, or Twelve Step sponsors, as well.

We undertook this study to ascertain whether virtual NA meetings had emerged relative to face-to-face meetings since the pandemic arose; how members perceived the effectiveness of virtual meetings in maintaining abstinence; and what respondent characteristics were associated with this relative transition. In order to address these questions, we surveyed a sample of USA NA members.

METHOD

COVID-19 stay-at-home restrictions were the first ones announced in New York, California, Illinois, and Washington states between March 19–23, 2020. The launch of stay-at-home orders led to a spread of these orders around the country. This led the authors to survey members around the same time. Members then submitted their surveys to NA World Services online. An agreement was made with the NA World Service office, located in Chatsworth, CA, for their membership office to email an anonymous survey to subscribers to the NA newsletter. Its purpose was to assess their experience during the period of stay-at-home restrictions. The study was approved by the Institutional Review Boards of the Chestnut Health System and NYU Medical School, with no consent required. The email was therefore sent to NA members ($N \approx 10,000$), and it stated that they could volunteer to respond to an attached anonymous survey about the COVID-19 period, if they chose to do so. The survey included an item asking if the respondent was a resident of the US. Technically, only that person could send one response to the survey that was attached to the email. It was emailed on June 8, to allow for assessing the impact of this period of relative isolation on the respondents' participation in NA meetings. Anonymous responses were analyzed by the authors for US respondents, after which the files were deleted to protect respondents' personal information.

Measures

Two types of meetings were distinguished: face to face (f/f), those held in the traditional fashion, with participants located in the same place; virtual, those held on the internet, typically in the Zoom application. Respondents were also asked to rate their assessment of whether the 2 types of meetings were supportive of abstinence for 2 types of participants: for themselves, and for newcomers to NA. The effectiveness of meetings was rated in a 5 point scale: 1, f/f best; 2, f/f better; 3, about the same; 4, virtual better; 5, virtual best.

We used Likert scales that were employed and validated in our previous studies¹⁹ to assess the degree of members' involvement in the fellowship. One measured the intensity of their affiliative feelings toward NA members as opposed to non-members (sample item, "They care for me"). The relative cohesiveness toward NA was calculated as the difference between the total scores of cohesiveness for the NA members minus those for non-members. A second scale measured the degree of ascription to NA-related beliefs (eg, "I am powerless over addiction").

Craving for drugs or alcohol was assessed by responses to a 0- to 10-point visual analog scale, similar to one previously applied.^{6,9} Duration of abstinence was queried in the survey: "How many months has it been since you last used alcohol or drugs?"

A 6-item psychological distress scale drawn from SCL-90 items was employed. It had been validated for patients with SUDs²⁰ (eg, "Feeling blue"). A loneliness scale²¹ (eg "How often do you feel left out?") was also employed. It had been found to document the relationship between loneliness and several commonly used measures of objective social isolation.

Relationship Among Variables

Paired samples *t*-tests were conducted to compare the number of face-to-face meetings before COVID-19 to the number of virtual meetings and face-to-face meetings in the past week. Independent samples *t*-tests were conducted to compare participants who experienced an increase in drug craving to those who did not in regard to net loneliness and length of time of their abstinence from alcohol and other drugs.

One-way ANOVA tests with post hoc Bonferroni pairwise comparisons were conducted to examine differences between race groups in regard to continuous outcomes. Additionally, logistic regression analyses were conducted to examine differences between race groups in regard to binary outcomes. Finally, Cohen's *d* effect sizes were calculated to supplement results for continuous outcomes. All analyses were conducted using the Statistical Package for the Social Sciences, version 20 (SPSS, IBM Corporation, Armonk, New York).

Community-based Findings

In order to relate our findings to Twelve Step activity in the broader community, we requested information on community-based changes during COVID-19 as evident in internet activity. We contacted the co-founder of the website "In the Rooms." This independent website reports serving 712,000 participants, primarily in Twelve Step Recovery (R Tannenbaum, personal communication, September 20, 2020).

RESULTS

Respondents' Characteristics

Of the surveys sent to the (approximately) 10,000 NA newsletter recipients, 3480 returned. Of them, 2152 were from US residents. Thus, at least 2152/8672, or ~24.8% of US newsletter recipients, responded. (The actual percentage is probably greater, since many of the non-respondent recipients were likely not US residents.)

As indicated in Table 1, respondents were predominantly middle-aged and Caucasian, had a variety of substances that they listed as having been their principal drug problems, were currently long abstinent and (on a scale of 1–10) reported a small amount of drug craving. At some point in their lives, the majority had received psychological treatment (apart from treatment for SUDs).

Experiences in Narcotics Anonymous

On average, respondents attended their first Twelve Step meeting at age 29.8 (9.9); 77% had completed all Twelve Steps; and 97.2% reported having had a spiritual awakening. The large majority (90.1%) currently have a sponsor and had, themselves, sponsored other NA members (85.5%). Most (65%) attended traditional worship services seldom or never. Regarding spiritual aspects of the Twelve Step experience, they reported that on most days they both prayed (83.2%), and they felt God's presence in their lives on most or all days (79.1%). They attended fewer face-to-face meetings during the past week than before the pandemic (0.75 (SD 1.80), $t = 51.93$, $df = 2135$, $P < 0.001$). Additionally, many attended virtual meetings far from home; 44.4% had attended a virtual meeting outside their time zone, and 21.5% had attended meetings conducted outside the USA. Net cohesiveness toward the 10 NA members minus that for non-members was 7.70 (SD 6.02).

Virtual Meeting Attendance

Results of a paired samples t -test support that survey participants attended significantly more virtual meetings in the past week ($\bar{x} = 4.13$, SD 4.64) than face-to-face meetings before COVID-19 ($\bar{x} = 3.35$, SD 2.05, $t[2143] = 7.89$, $P < 0.001$). They also attended significantly fewer face-to-face meetings last week ($\bar{x} = 0.75$, SD 1.80) than they did on average before COVID-19 ($\bar{x} = 3.35$, $t[2135] = -51.93$, $P < 0.001$, Cohen's $d = -1.26$).

Participants who reported an increase in craving during the pandemic were compared to those who reported no change or a decrease in drug craving. The former group reported having had a shorter antecedent length of abstinence from alcohol and other drugs ($t[709.13] = 14.59$, $P < 0.001$), an increase in net loneliness ($t[464.18] = -4.84$, $P < 0.001$), and a lower relative score on Cohesion toward members, rather than non-members ($t[1780] = 2.03$, $P < 0.042$).

Results of the 1 sample non-parametric chi-square test indicate that participants were significantly more likely to agree that virtual meetings were as good or better than face-to-face meetings for maintaining their abstinence, with 64.9% of the sample endorsing this item ($\chi^2 = 1319$, $P < 0.001$). However, 41.8% of the sample agreed that virtual meetings were good as or better than face-to-face meetings for maintaining a newcomer's abstinence ($\chi^2 = 852$, $P < 0.001$).

Ethnicity

Results of the 1-way ANOVA with post hoc Bonferroni tests are provided in Table 2. The omnibus F test indicated that there were significant differences between racial groups. Post hoc results indicate that Black participants attended more virtual meetings, had less of a distinction with regard to cohesion between NA group members and non-NA peers, were less lonely last week, had lower net loneliness, and less distress relative to White participants. Hispanic participants also attended more virtual meetings than White participants, but did not differ in regard to the other outcomes. Minority groups' scores on depth of belief in NA, on spiritual awakening and NA beliefs, however, were no different from those of Whites.

Results of the logistic regression analyses are provided in Table 2. Relative to White participants, Black participants were less likely to experience an increase in craving during the pandemic, and were less likely to have had prior counseling for mental health. They were more likely to endorse that virtual meetings were as good as or better than face-to-face meetings for their own abstinence, and more likely to endorse that virtual meetings were as good as or better than face-to-face meetings for a newcomer's abstinence relative to White participants. Of the Black respondents, 23.6% indicated that they did not think that virtual meetings were as good as face-to-face for themselves. Additionally, Black participants were more likely to have attended 1 or more virtual meetings than White participants, but this finding only approached statistical significance ($P = 0.055$).

Hispanic participants were also less likely to experience an increase in drug craving during the pandemic, more likely to have attended 1 or more virtual meetings, and more likely to endorse virtual meetings as good as or better than face-to-face

TABLE 1. The Respondents (N = 2152)

	Mean (SD); %
Age	52.3 (12.60)
Ethnicity	
White	76.7%
Black	10.5%
Hispanic/Latino	5.8%
Asian	0.9%
Other	6.1%
Principal drug problem	
Cocaine or crack	25.5%
Stimulants	2.1%
Heroin	19.8%
Other opiates (like Percocet or Oxycontin)	13.5%
Crystal meth	16.1%
Alcohol	14.4%
Marijuana	8.6%
NA craving	
Before COVID	0.58 (1.64)
Last week	0.81 (1.81)
Last used substances, y	16.4 (12.4)
Had received psychological treatment	53.8%

TABLE 2. Differences Between Race Groups

Continuous Outcomes: One-Way ANOVA with Post Hoc Bonferroni										
Measure	Mean	SD	F	df		P	Bonferroni			
				Between	Within		White vs Black		White vs Hispanic	
							Cohen's d	P	Cohen's d	P
Total virtual meetings			23.61	2	1995	<0.001	0.42	<0.001	0.45	<0.001
White	3.74	4.28								
Black	5.54	5.67								
Hispanic	5.67	5.74								
Net cohesion			3.47	2	1651	0.031	-0.21	0.026	-0.02	1
White	7.83	5.94								
Black	6.57	6.53								
Hispanic	7.73	6.25								
Loneliness last week			8.84	2	1944	<0.001	-0.29	<0.001	-0.11	0.7
White	4.82	1.87								
Black	4.27	1.55								
Hispanic	4.61	1.9								
Net loneliness			4.9	2	1918	0.008	-0.22	0.005	-0.05	1
White	0.24	1.67								
Black	-0.14	1.34								
Hispanic	0.16	1.57								
Psych distress			13.23	2	1953	<0.001	-0.35	<0.001	-0.14	0.342
White	10.88	4.87								
Black	9.18	3.42								
Hispanic	10.19	4.99								

Binary Outcomes: Logistic Regression

Measure	Count	%	B	S.E.	Wald	df	P	Odds Ratio	Odds Ratio 95% CI	
									Lower	Upper
Increased craving										
White	324	19.6%			23.23	2	<0.001			
Black	16	7.1%	-1.17	0.27	19.1	1	<0.001	0.31	0.18	0.53
Hispanic	14	11.3%	-0.65	0.29	5.04	1	0.025	0.52	0.29	0.92
Virtual meeting attendance (1+ meetings)										
White	1385	84.0%			11.62	2	0.003			
Black	201	88.9%	0.43	0.22	3.68	1	0.055	1.53	0.99	2.37
Hispanic	116	94.3%	1.15	0.39	8.48	1	0.004	3.16	1.46	6.85
Prior counseling										
White	900	55.1%			4.76	2	0.093			
Black	106	47.3%	-0.31	0.14	4.75	1	0.029	0.73	0.55	0.97
Hispanic	66	53.7%	-0.06	0.19	0.09	1	0.76	0.94	0.65	1.36
You abstinence virtual										
White	977	62.9%			15.8	2	0			
Black	165	76.4%	0.65	0.17	14.67	1	0	1.91	1.37	2.65
Hispanic	81	69.2%	0.28	0.21	1.86	1	0.172	1.33	0.88	1.99
Newcomer abstinence virtual										
White	621	40.1%			19.15	2	0			
Black	112	54.1%	0.57	0.15	14.43	1	0	1.76	1.31	2.36
Hispanic	60	52.2%	0.49	0.19	6.33	1	0.012	1.63	1.11	2.38

meetings for a newcomer’s abstinence relative to White participants. They did not, however, differ from White participants on other variables.

Exploratory analyses were conducted to determine whether other items or scales in the survey had meaningful associations or outcomes of interest. They indicated that other items and scales were either not significantly related to outcome, or the effect sizes were so small that they were not of clinical significance, such as the number of Steps (of the 12) worked; or living alone or with family.

In terms of community-based findings, the considerable change in internet-based meetings is reflected in the

communication from the independent-based program supporting Twelve Step recovery. This report indicates since the onset of the COVID-19 pandemic, there was an increase an average of 170 to 465 weekly attendees at virtual Twelve Step meetings at their site.

DISCUSSION

The respondents to our survey were well-established NA members, in that their attendance at their first Twelve Step meeting had taken place an average of over 23 years beforehand. They indicated high levels of NA belief, high levels of cohesiveness to other members, and high levels of involvement

in NA sponsorship. They had now attended more NA meetings virtually than they had attended face-to-face beforehand, and they attended few face-to-face meetings currently. Notably, therefore, their choice of virtual meetings largely replaced face-to-face meetings during the COVID-19 period. The authors do not know which survey recipients were in states with or without stay-at-home orders.

The option of virtual meetings in the COVID-19 period apparently presented a positive option within the fellowship, and possibly for newcomers as well. Members could now attend virtual meetings in areas remote from their local meeting sites. This is evident in the fact that almost half of respondents had now attended such meetings outside of the time zone in which they live, with many responding that they had also attended meetings originating overseas. This may offer NA members more flexibility in scheduling, particularly for those in areas where there are no nearby meetings. The emergence of access to a great variety of remote, even international ties, may increase the impression of the fellowship's universality. We have previously found that cohesiveness felt toward members of such groups beyond one's immediate acquaintances is associated with closer ties to the overall group.²² Additionally, social anxiety has been found to detract from the likelihood of a person with SUD becoming engaged in treatment²³ and the perceived exposure to strangers in face-to-face Twelve Step meetings. The option of initial encounters with the fellowship available without actually being exposed to this source of aversive anxiety may serve to minimize this problem.

Not all respondents experienced the same vulnerability to increased craving during the COVID-19 period. Those who had a shorter period of antecedent drug-free status, lower relative cohesiveness to other members and those who experienced an increase in loneliness over that period were more likely to have experienced increased craving, suggesting that less well-established members with more psychological vulnerability may have more difficulty in maintaining abstinence in the face of COVID-19. This is particularly relevant in terms of research into the mediation and moderation of craving, which has been studied. The mediation of Twelve Step practices relative to improved drinking outcome in AA members has been studied in relation to their spirituality.^{24,25} Newer members may struggle with craving and sobriety because they have not made sufficient progress in multiple areas considered mediators, including enhancing self-efficacy, coping skills, and motivation, in addition to a spiritual awakening.²⁶ Higher levels of spirituality and spiritual awakening in TS meetings have also been found to be associated with decreased craving.²⁷

Overall, Blacks were less troubled and responded more positively to the virtual meetings than Whites. They were less likely to have had non-SUD counseling, reported less experience of loneliness currently, and less of an increase in loneliness from the onset of COVID-19; less psychological distress, and less likelihood to experience an increase in craving during the pandemic. They were also more likely than Whites to have attended virtual meetings, and to have judged them to be as good as or better than face-to-face meetings for both themselves and newcomers.

There are reports of problems encountered in the responsiveness of Blacks to both SUD treatment and Twelve Step participation.^{28–30} The apparently more positive experience of these Black NA respondents during the pandemic may suggest a meaningful distinction from the experience of White members. For example, even if Black people with SUDs may be underrepresented in TS meetings, they may fare as well or better than Whites under certain circumstances when they become engaged. Further investigation into these findings is warranted.

Since our respondents were drawn from a group of long-standing NA members, it was useful to solicit information from a community-based source. The personal communication from the co-founder of the Twelve Step-related independent website is relevant here. It confirms an increase in virtual meeting attendance overall, suggesting that the increase in internet-based virtual meetings was represented among members from the overall Twelve Step-related community, and not just our respondents.

Case and Deaton³¹ found that there has been an increase in deaths for non-college-educated Whites from drug and alcohol use disorders and suicide in recent decades. They indicate that the emergence of this trend is one of “deaths of despair” resulting from a lack of hope for the future and a compromise in access to the medical care that might address the problem. Religious services have been found to play a structured role for relief from SUDs for many members of the general public.^{32,33} Although the large majority of our respondents seldom or never attend traditional worship services, they can, however, achieve such structured support from their involvement in the self-designated spiritual fellowship of NA, particularly at the time of deficit in access to social and mutual experience in the COVID era. This is embodied in the peer support and access to meaning and purpose in life,^{10,34} key aspects of the recovery capital.

LIMITATIONS

Respondents to this survey are not necessarily representative of a cross-section of NA members overall. Persons attending NA meetings were not likely included, such as occasional attenders, newcomers or those who are unstable or in relapse. Seasoned members' perspective may be quite different from those of newcomers. Generalizing from the findings reported here is therefore limited. Additionally, many of the items solicited in this survey were retrospective.

Additionally, while craving was analyzed as a dependent variable regarding the impact of COVID-19 on NA, aspects of functional outcome are also relevant. Although these were not included in this survey, they bear further study. An independent website for Twelve Step attendees reported a considerable growth in virtual meetings during the COVID-19 period. This does not, however, indicate any specific information on these attendees themselves, or any information on what benefit they may have derived from the meetings reported.

Operating NA meetings in a virtual manner is only one aspect of the circumstances associated with stabilizing NA members' abstinence during the COVID-19 period. Benefit from individual contacts with other members, such as those between sponsors and sponsees, and access to NA literature are important elements as well. These latter supports, likely

associated with a positive outcome, were not dealt with in this survey. Further research would be needed on this count.

CONCLUSION

The onset of COVID-19 presented a particular problem for the role of Twelve Step programs in promoting addiction recovery, since members employ face-to-face meetings as an important aspect of their participation. Among the long-term NA members we studied relative to their respective experiences, most successfully achieved a transition from this face-to-face format to internet-based virtual meetings. They reported experiencing only a limited increase in both loneliness and drug craving during this period. Many estimated that benefit with the transition can be derived for newcomers, as well, but further study on the benefits of virtual meetings to less established or unstable persons with SUDs would be useful. Distinctions by racial background were observed. A website reporting on community-based findings also suggests that there was wider access to virtual Twelve Step meetings. The option of accessing virtual meetings may therefore provide an opportunity for continuing contact with the fellowship during the COVID-19 period and potential utility for sustaining abstinence. Clinicians can access available meetings in their respective locations by accessing on the internet. These findings can be useful for clinicians and for further research on online virtual treatment, as well.

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