AIDS Behav
DOI 10.1007/s10461-012-0277-z

BRIEF REPORT

Use of the Location-Based Social Networking Application GRINDR as a Recruitment Tool in Rectal Microbicide Development Research

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Abstract Mobile phone social networking applications such as GRINDR are potential tools for recruitment of men who have sex with men (MSM) for HIV prevention research. Demographics and sexual risk behaviors of men recruited through GRINDR and through traditional media were compared. GRINDR participants were younger (mean age 31 vs. 42, $p < 0.0001$), more White identified (44 vs. 30 %, $p < 0.01$), and had more sex partners in the previous 14 days (1.88 vs. 1.10, $p < 0.05$) than other recruits. Email responses were less successful for enrollment than phone calls (5 vs. 50 %). This approach resulted in successful recruitment of younger and more educated, White identified MSM.

Keywords Mobile phone · Social networking · Recruitment · MSM · HIV

Background

Information and communication technology is rapidly diffusing globally; over the next 5–10 years smart mobile phones will be broadly disseminated, connecting billions of people to the Internet [1]. The Internet is increasingly being used in the scale-up of health systems enabling lower cost, highly engaging, and ubiquitous STD/HIV prevention and treatment support interventions [2–6]. Mobile phone social networking applications have the potential to be an important tool in identifying and recruiting at-risk men who have sex with men (MSM) for HIV prevention research [7–14], including HIV/AIDS related clinical trials.

Recruitment of participants for randomized clinical trial has become increasingly challenging [15–17]. A recent survey of corresponding authors of randomized trials published between the years 2000 and 2001 in the Lancet or British Medical Journal found that nearly 60 % had either failed to meet their recruitment target or required an extended recruitment period [18]. Engaging MSM in particular is a concern because of their continuing high incidence of HIV [19]. Risk behaviors among MSM have been increasing across all races/ethnicities and age groups [20–23], mirrored by rising rates of HIV [24–28]. These rising HIV rates have led to calls for intensified prevention efforts [29, 30] including the trial of biomedical interventions such as pre-exposure prophylaxis based rectal microbicides.

Internet use is rapidly increasing in the United States [31] and the Internet has been shown to be an efficient format for collecting data on human sexual behavior [32]. In recent years the internet has become increasingly popular as a means for meeting sex partners [33–38]. Coincident with these increases is MSM's burgeoning Internet use [39–41]. MSM were early adopters of the Internet, and a recent review concluded that 35–45 % of MSM now access the Internet to seek sexual partners [42]. New smart mobile phone social networking applications have also become popular among MSM, and allow users to find restaurants, clubs, and bars, and meet other men through on-line dating

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Published online: 01 August 2012

services. These applications are possible tools to enhance targeted recruitment for HIV prevention studies and interventions within this population.

GRINDR is an MSM-specific location-based social networking application for smart phones originally developed as a free service in 2009, but now available in both free and subscription-based versions. The service works with the Apple iPhone, iPod touch, iPad and, more recently, compatible BlackBerry and Android devices to connect local users through the sharing of profiles, photos, personal statistics, as well as the option to chat, trade pictures, and share one's location anonymously. GRINDR makes use of GPS technology in the iPhone, BlackBerry, and Android and Wi-Fi in the iPod touch or iPad to determine the users exact location and display a grid of users pictures, arranged from nearest to farthest away. Tapping on a picture will display a brief profile for that user. GRINDR is extremely popular among MSM, with almost 50,000 subscribing in the Los Angeles area within a year of the application's launch. These features make GRINDR an attractive social networking application for the recruitment of MSM.

Methods

A clinical trial was conducted to inform the development of rectal microbicide products by providing data on anal intercourse, rectal health, and the acceptability of carrier methods for rectal microbicides in Los Angeles, CA in 2010. We measured the experiences with, and preferences between three potential anorectal microbicide delivery systems among 105 men and 25 women screened, enrolled and randomized to a sequence of 3 different over the counter (OTC) products used anorectally 3–5 times over an eight-week period. Eligibility criteria included being 18 years of age or older, having a HIV negative test result at visit 1, reporting receptive anal intercourse (RAI) at least once within the previous 30 days of visit 1 (males) or RAI at least once within the previous 12 months of visit 1 (females), a negative syphilis, rectal gonorrhea, and rectal chlamydia test results at visit 1, a negative pregnancy test at visit 1 (females), being willing and able to try all three anorectal product delivery systems, complete study questionnaire via telephone, complete computer-assisted questionnaires during clinic visits, and being willing and able to give informed consent for study participation.

Participants were primarily recruited through traditional recruitment techniques such as referrals through ongoing Microbicide Development Program (MDP) projects being conducted at the University of California, Los Angeles (UCLA), the Network for AIDS Research in Los Angeles (NARLA) research registry, informational fliers and outreach at local HIV/AIDS health clinics and community-based organizations, print advertisements in local publications, and Internet postings on craigslist.org. Beginning in May 2010 the social networking application GRINDR was introduced as an additional recruitment approach. GRINDR was used to recruit HIV-negative males reporting a history of receptive anal sex for this rectal microbicide acceptability clinical trial. We compare rates of recruitment, demographic characteristics, and sexual risk behaviors of men recruited into this randomized clinical trial from traditional recruitment techniques and GRINDR.

When logging on to GRINDR, all users receive a broadcast advertisement. Any particular broadcast is sent out once in a defined area for 24 hours, allowing every user who logs on in that time period to see the broadcast. This is approximately 70 % of registered users in Los Angeles County. GRINDR allows advertisers to define the broadcast location and radius of the area included in each broadcast. For this study we sent out two broadcast blasts, the first an 8 mile radius centered on West Hollywood, CA and the second a 20 mile radius centered on downtown LA—covering most all of LA County. Each blast was received by all users logging on within the 24 hours of May 10 and July 7, 2010 respectively. The broadcast was linked to the study email and phone number contact information through a landing page describing more about the study that users saw when they clicked "more".

Demographics and sexual risk behaviors were compared between those men recruited through our combined GRINDR broadcast blasts and those recruited through traditional referrals, fliers, outreach, print, and/or web advertisements. Women recruited for this study are not included in the analysis presented here as GRINDR is MSM-specific. Data analysis was performed using SAS software (SAS/STAT 9.2, SAS Institute Inc., Cary, NC, USA). Demographic and sexual risk patterns were characterized using descriptive statistics. The Pearson χ^2 test was used to evaluate basic univariate associations, and results reported as significant ($p = 0.05$).

Results

In 2010, GRINDR had 46,400 total Los Angeles users, with about 70 % logging in daily. This resulted in 32,480 users who received our broadcast. From both the May and July 2010 broadcasts, 1,389 men clicked through to our landing page, or 4.3 % of users who saw the broadcast. We received 137 contacts through email or phone call from interested men. This corresponds to an overall response rate of 10 % of men who clicked through, and

Table 1 Select baseline demographics and sexual risk behaviors for total male participants and by recruitment method (N = 105)

Select baseline demographics	Total % (N)	Recruitment method		*p* value
		GRINDR (n = 24) %	Other (n = 81) %	
Participants	100 (105)	23.8	75.2	–
18–30 years old	27.6 (105)	56.0	18.8	0.0003
White identified	33.7 (103)	44.0	30.4	0.009
English speaking	93.3 (104)	88.0	94.9	0.4239
College education or more	47.1 (102)	68.0	40.3	0.0158
Homeless in previous 12 months	5.8 (104)	0.0	7.6	0.1558

Select baseline sexual risk behaviors	Total mean (range)	Recruitment method		*p* value
		GRINDR mean (range)	Other mean (range)	
Lifetime anal intercourse partners	73.4 (1–2000)	79.6 (1–500)	71.2 (1–2000)	0.8822
Anal intercourse partners in previous year	6.7 (0–60)	8.9 (0–60)	5.9 (0–50)	0.1944
Receptive anal intercourse acts in previous 14 days	1.9 (0–28)	2.0 (0–20)	1.8 (0–28)	0.8794
Insertive anal intercourse acts in previous 14 days	2.0 (0–24)	2.5 (0–18)	1.9 (0–24)	0.4701
Lifetime vaginal intercourse partners	15.2 (0–400)	2.2 (0–30)	19.3 (0–400)	0.1489
Vaginal intercourse partners in previous year	1.1 (0–20)	0.7 (0–15)	1.3 (0–20)	0.4317
Vaginal intercourse acts in previous 14 days	0.6 (0–12)	0.5 (0–12)	0.6 (0–12)	0.8809

approximately 0.3 % of total GRINDR users in LA County. Email responses had a lower successful "live contact" rate compared to phone calls, about 5 vs. 50 % (data based on first broadcast centered on West Hollywood, CA only).

Among all men who completed the study (N = 105), 27.6 % were between 18–30 years old (29/105) with a mean and median age of 39.5 and 38.4 respectively, 33.7 % were White identified (35/103), 93.3 % were English speaking (97/104), 47.1 % had a college education or more (48/102), and 5.8 % reported that they had been homeless in the previous 12 months (6/104) (Table 1). The sample had a mean of 73.4 (range 1–2,000) lifetime anal intercourse partners, 6.7 (0–60) anal intercourse partners in the previous year, 1.9 (0–28) RAI acts in the previous 14 days, and 2.0 (0–24) insertive anal intercourse acts in the previous 14 days. Men also reported 15.2 (0–400) lifetime vaginal intercourse partners and 1.1 (0–20) vaginal intercourse partners in the previous year. Approximately one-third (30.4 %) of men reported having a vaginal sex partner in the previous 14 days, with an average of 0.6 (0–12) vaginal intercourse acts in the previous 14 days.

In total, 23.8 % of male participants were recruited through our two GRINDR broadcast advertisements. GRINDR respondents were more likely to complete their screening visit and enroll in the study after screening (24/25) compared to other recruitment strategies (93/123) ($p < 0.05$). Baseline demographics differed significantly by recruitment method with 56 % of GRINDR participants ranging from 18 to 30 years old compared to 19 % of participants recruited through other methods ($p < 0.01$) and 44 % of GRINDR participants identifying as White compared to 30 % of other participants ($p < 0.01$) (Table 1). GRINDR participants also tended to be more educated with 68 % of GRINDR participants reporting college education or more compared to 40 % of other participants ($p < 0.02$).

Although not statistically significant, men recruited through GRINDR reported a mean of 9 anal sex partners in the previous year compared to 6 reported by other participants ($p = 0.19$), and an average of 2 lifetime vaginal sex partners compared to 19 reported by men recruited through other methods ($p = 0.16$) (Table 1).

Conclusions

There are several limitations to consider. There was only one study site and a relatively small sample size, which limits generalizability of our results. Do to the nature of the broadcast blast, we were unable to differentiate participants recruited from our two geographic broadcast blasts. Additionally, no information was collected on reasons why GRINDR respondents did not enroll compared to those who did.

GRINDR was a high throughput recruitment technique with almost a quarter of our entire study recruited from only two broadcast blasts, and had a higher rate of

successful screening visits and subsequent enrollment than traditional recruitment techniques. Generally, participants recruited from GRINDR were younger than those recruited from other sources.

Participants recruited through GRINDR were more White identified and reported more college education than participants recruited from other methods. This could be the results of a recruitment strategy that relies on the use of a smart phone application, implicitly recruiting users with smart phone contracts. White, educated participants also meant fewer who were unemployed and therefore increased scheduling difficulty. However, GRINDR participants had more stable phone numbers, were more reliable at attending clinic visits once they were scheduled, and had a lower screen-failure rate than those recruited via other methods.

We found GRINDR to be an efficient and effective tool for the identification and recruitment of a targeted high-risk MSM population in Los Angeles County. Our two single broadcast events required minimal preparation and technical expertise to launch, and resulted in 137 contacts through email or phone calls from interested men. Participants were highly motivated and altruistic, however their relative affluence resulted in some scheduling conflicts between our clinic and their working hours. More research is needed to explore alternative social networking applications and their ability to target specific sup-groups within the Los Angeles County MSM population, and demonstrate the efficacy of these recruitment approaches against proven recruitment strategies.

Acknowledgments UCLA Microbicide Development Program Project 3 funded by NIH Grant IPCP U19 AI060614.

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