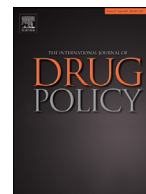




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Research Paper

Virtual raves and happy hours during COVID-19: New drug use contexts for electronic dance music partygoers

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ABSTRACT

Background: The popularity of virtual raves and happy hours has increased during the COVID-19 pandemic. While nightlife settings are often associated with drug use, it is unknown whether virtual events are associated with use.

Methods: Electronic dance music (EDM) partygoers who live in New York and reported recent drug use were recruited online and screened for eligibility throughout April and May 2020. Eligible adults ($n = 128$) were asked about virtual rave and happy hour attendance during the COVID-19 crisis. We examined prevalence and correlates of drug use during such events.

Results: 55.5% of participants attended virtual raves and 69.5% attended virtual happy hours. 40.9% used illegal drugs during virtual raves and the most frequently used drugs were cannabis (29.6%), ecstasy/MDMA/Molly (8.5%), LSD (7.0%), and cocaine (4.2%). 33.7% used illegal drugs during virtual happy hours and the most frequently used drugs were cannabis (29.2%), cocaine (3.4%), and ketamine (3.4%). Older participants were more likely to use illegal drugs during virtual raves, and those reporting past-year use of more drugs were more likely to use drugs during virtual raves and/or happy hours ($ps < 0.05$).

Conclusions: EDM partygoers are at risk for using drugs during virtual events. Results can inform prevention and harm reduction efforts.

Introduction

The COVID-19 pandemic has led to widespread social distancing measures in effort to curb transmission of the virus. Social distancing has had a substantial effect on nightlife, with many governments temporarily banning gatherings in such settings. This has resulted in the temporary closure of nightclubs and the cancelation of large dance festivals. However, some forms of nightlife have shifted to online platforms, and virtual raves and virtual happy hours have become popular means for people to socialize and/or to experience live DJ performances while social distancing (Goldfarb, 2020; Ren, 2020; Weaver, Yar, Wortham, & Oswaks, 2020). Virtual happy hours in particular have become more common (Goldfarb, 2020; Weaver et al., 2020), although this term appears to apply to various types of social gatherings whether or not alcohol consumption is involved. Such virtual events are easily hosted or attended through free popular online video-conferencing platforms such as Zoom or Google Hangouts.

While virtual meetings have been popular for work and social gatherings for some time, virtual raves, sometimes referred to as cloud raves, appear to be a newer phenomenon. Virtual raves are DJ events which

are typically live broadcasted to thousands or even millions of people around the world through Twitch or other platforms (Ren, 2020; Weaver et al., 2020). While some virtual raves are small, others are hosted by major festival promoters. In May, for example, Electric Daisy Circus, the largest electronic dance music (EDM) dance festival in the US, held a virtual rave-a-thon featuring many leading international EDM DJs. Minecraft is also planning to host the largest virtual rave to date called Rave Family Block Fest which is scheduled to feature over 950 artists, 65 virtual stages, and hundreds of millions of people are expected to watch (Potter L, 2020). Given increasing popularity of such virtual events, it is important to determine whether attendance is associated with health-related behaviors such as drug use.

People who attend non-virtual EDM events at nightclubs or dance festivals are at high risk for party drugs such as ecstasy (MDMA, Molly), cocaine, LSD, and amphetamine (Fernandez-Calderon, Cleland, & Palamar, 2017; Krotulski, Mohr, Fogarty, & Logan, 2018; Palamar, Acosta, Le, Cleland, & Nelson, 2019). EDM parties are often considered high-risk environments not only because of high prevalence of drug use, but also because environmental factors such as heat, overcrowding, lack of drinking water, and/or lack of places to rest or cool off can increase

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the risk of experiencing adverse drug-related effects (Bellis, Hughes, & Lowey, 2002; Parrott, 2004). However, use in more laid-back contexts may reduce risk of adverse effects that are largely dependent on such environments.

While decades of research have focused on drug-related risk behavior within the EDM scene, research is needed to determine the extent to which virtual events are associated with drug use. The aim of this study is to examine the extent of drug use during virtual raves and happy hours among drug using EDM partygoers in order to inform prevention and harm reduction efforts.

Methods

Study procedures and participants

This study was an online extension of our parent study and this extension was conducted in order to examine drug use patterns during COVID-19 social distancing. The study flyer was posted on social media sites and aimed to attract EDM partygoers. The flyer advertised that we were seeking EDM party-going adults who live in NYC and that we were aiming to research drug use during the COVID-19 crisis. The flyer noted that those who were eligible for and completed the full survey would be compensated with a \$10 USD online gift certificate from a vendor such as Amazon. Interested individuals clicked the study URL which took them to a two-minute screener survey. This was used not only to determine eligibility, but also to flag potential mischievous responses and overreporting which was expected given that we offered compensation for survey completion (Palamar & Acosta, 2020).

To be eligible, individuals must: 1) be age ≥ 18 , 2) report having attended an EDM party in the past six months, 3) report living in New York, 4) provide an email address where we can send the full survey, and 5) report past-3-month use of at least one drug queried (i.e., cannabis, ecstasy/MDMA/Molly, cocaine, LSD, ketamine, heroin) or report past-3-month vaping of any substance including nicotine. The New York University Langone Medical Center institutional review board approved all study procedures.

Screener

After providing informed consent on the first page of the screener, participants were asked about demographic characteristics and about criteria described above to determine eligibility. The screener also contained a variety of questions to gauge overreporting and mischievous and careless responses (Palamar & Acosta, 2020). This included questions about legal blindness and deafness, weight, and number of siblings in order to detect patterns of extreme responses (e.g., weight of <75 lbs. or having >10 siblings) (Furlong, Fullchange, & Dowdy, 2017). A fictitious drug was also listed to further detect overreporting (Fernandez-Calderon et al., 2017).

We also conducted numerous checks for repeated submissions (from the same email or IP address) and we examined suspicious patterns or clusters of submissions with similar email addresses and with nearly identical text box responses (Palamar & Acosta, 2020). This system allowed us to detect an abundance of suspicious screener submissions. Between April 18 and May 25, 2020, we received 786 screener submissions; however, given the eligibility and screening criteria, only 20% ($n = 156$) of participants submitting a screener survey were determined to be eligible. Only individuals determined eligible were sent an email containing a link to the full survey. Of those invited, 128 completed the survey.

Full survey

The survey invitation email contained a unique ID number which participants entered on the first page of the survey. This ID allowed

us to link screener responses to full survey responses. Similar to previous studies (Palamar, Le, Acosta, & Cleland, 2019), demographic information (i.e., age, sex, race/ethnicity) had to match the information provided on the screener for participants to be considered eligible for compensation. The survey asked about demographic characteristics and about past-year use of various drugs. The survey also asked participants whether they had attended virtual raves or virtual happy hours since the COVID-19 crisis began. It was explained that virtual raves typically have a live DJ who streams for an audience and that virtual happy hours are typically group chats with friends. While non-virtual happy hours usually suggest alcoholic drink specials at a venue during certain times (Tutenges & Böhling, 2019), we did not note to participants that alcohol is commonly consumed during such events because we believe it is implied that alcohol is welcomed or promoted according to the name of the event. We defined the start of the COVID-19 crisis for participants as beginning the week of March 16, 2020, when Governor Cuomo requested the closure of nightlife venues and began asking New York residents to stay home. Those reporting having attended a virtual rave or happy hour were asked if they had used drugs or alcohol during the event. Those reporting use were asked to type in the name(s) of the substance(s) used.

Statistical analysis

First, frequencies and percentages were generated to describe sample characteristics, virtual rave and happy hour attendance, and drug use during such events. Next, each covariate was examined in a bivariable manner via chi-square and independent samples *t*-test. Finally, all covariates were fit into a multivariable generalized linear model using Poisson and log link, which generated adjusted prevalence ratios (aPRs) for each covariate. This was done for virtual raves and virtual happy hours separately.

Results

On average, participants were age 23.3 (SD=4.4, range: 18–42), and the majority identified as female (61.7%, $n = 79$) and had a college degree (55.5%, $n = 71$). With regard to race/ethnicity, 41.4% ($n = 53$) identified as white, 43.0% ($n = 55$) identified as Asian, 8.6% ($n = 11$) identified as other/mixed race, 5.5% ($n = 7$) identified as Hispanic, and 1.6% ($n = 2$) identified as black. Past-year drug use was prevalent and was reported as follows: alcohol (93.8%, $n = 120$), cannabis (93.8%, $n = 120$), ecstasy/MDMA/Molly (59.4%, $n = 76$), cocaine (48.4%, $n = 62$), LSD (37.5%, $n = 48$), amphetamine (nonmedical use; 29.5%, $n = 38$), ketamine (28.1%, $n = 36$), and mushrooms (28.1%, $n = 36$).

Over half (55.5%; $n = 71$) of participants reported having attended a virtual rave since the beginning of the COVID-19 crisis in New York. 60.6% ($n = 43$) reported using a drug or alcohol during a virtual rave, 40.9% ($n = 29$) used an illegal drug, and 18.3% ($n = 13$) used a drug other than cannabis. Alcohol was the most prevalent substance used (46.5%; $n = 33$), and with regard to illegal drugs, cannabis was the most prevalent drug (29.6%; $n = 21$), followed by ecstasy/MDMA/Molly (8.5%, $n = 6$), LSD (7.0%, $n = 5$), cocaine (4.2%, $n = 3$), ketamine (2.8%, $n = 2$), mushrooms (2.8%, $n = 2$), and DMT (1.4%, $n = 1$). Over two thirds (69.5%; $n = 89$) of participants reported attending virtual happy hours since the crisis began, and 80.9% ($n = 72$) reported using a drug or alcohol with 33.7% ($n = 30$) reporting use of an illegal drug. The majority (69.7%, $n = 62$) of participants reported using alcohol, and 7.9% ($n = 7$) used a drug other than cannabis. Cannabis was the most prevalent illegal drug used (29.2%, $n = 26$), followed by cocaine (3.4%, $n = 3$), ketamine (3.4%, $n = 3$), ecstasy/MDMA/Molly (2.3%, $n = 2$), and LSD (1.2%, $n = 1$).

Table 1 presents bivariable and multivariable models examining correlates of reporting illegal drug use during virtual raves and during virtual happy hours. In the multivariable model, older participants (aPR=1.10, 95% CI: 1.01–1.19) and those reporting past-year use of

Table 1
Correlates of using illegal drugs during virtual raves and virtual happy hours during COVID-19 social distancing.

	Drug Use at Virtual Raves (n = 71)			Drug Use at Virtual Happy Hours (n = 89)		
	Bivariable Comparisons		Model	Bivariable Comparisons		Model
	No (n = 42)% (n)	Yes (n = 29)% (n)	aPR (95% CI)	No (n = 59)% (n)	Yes (n = 30)% (n)	aPR (95% CI)
Age, years	M = 22.6 (SD=2.3)	M = 25.5 (SD=6.4)**	1.10 (1.01–1.19)*	M = 22.8 (SD=3.3)	M = 23.7 (SD=5.0)	1.04 (0.94–1.15)
Sex						
Male	61.9 (26)	62.1 (18)	1.00	64.4 (38)	73.3 (22)	1.00
Female	38.1 (16)	37.9 (11)	1.77 (0.72–4.39)	35.6 (21)	26.7 (8)	0.93 (0.39–2.19)
Race/Ethnicity						
White	31.0 (13)	51.7 (15)	1.00	45.8 (27)	33.3 (10)	1.00
Asian	54.8 (23)	34.5 (10)	1.04 (0.37–2.94)	44.1 (26)	46.7 (14)	1.66 (0.68–4.03)
Black/Hispanic/Other/Mixed	14.3 (6)	13.8 (4)	0.91 (0.28–2.89)	10.2 (6)	20.0 (6)	2.02 (0.71–5.71)
Education						
Less than High School	9.5 (4)	10.3 (3)	1.00	17.0 (10)	10.0 (3)	1.00
Some College	21.4 (9)	20.7 (6)	0.85 (0.19–3.78)	27.1 (16)	30.0 (9)	1.90 (0.44–8.25)
College Degree	69.1 (29)	69.0 (20)	0.35 (0.08–1.62)	55.9 (33)	60.0 (18)	1.14 (0.28–4.57)
Past-Year EDM Party Attendance						
Less than Monthly	21.4 (9)	27.6 (8)	1.00	25.4 (15)	33.3 (10)	1.00
Monthly	38.1 (16)	20.7 (6)	0.46 (0.15–1.43)	39.0 (23)	23.3 (7)	0.69 (0.24–1.98)
Every Other Week or More	40.5 (17)	51.7 (15)	0.79 (0.30–2.07)	35.6 (21)	43.3 (13)	0.95 (0.39–2.32)
Number of Drugs Used	M = 3.0 (SD=1.7)	M = 4.1 (SD=1.5)**	1.39 (1.06–1.82)*	M = 3.0 (SD=1.8)	M = 4.1 (SD=1.5)**	1.31 (1.03–1.66)*
Number of Weeks into Pandemic	M = 2.4 (SD=1.4)	M = 3.2 (SD=1.4)*	1.40 (1.04–1.88)*	M = 6.6 (SD=1.4)	M = 6.9 (SD=1.4)	1.20 (0.89–1.60)

Note. Number of drugs used refers to the number of drugs used in the past year. *M* = mean; *SD* = standard deviation; aPR = adjusted prevalence ratio; CI = confidence interval; EDM = electronic dance music.

* *p* < .05.

** *p* < .01.

more drugs (aPR=1.39, 95% CI: 1.06–1.82) were more likely to use drugs during virtual raves. Those surveyed further into the pandemic were also at higher risk for drug use during virtual raves (aPR=1.40, 95% CI: 1.04–1.88). With regard to correlates of drug use during virtual happy hours, in the multivariable model, reporting past-year use of more drugs (aPR=1.31, 95% CI: 1.03–1.66) were more likely to use drugs during virtual raves.

Discussion

This is the first study to examine drug use during virtual raves and happy hours. Among this sample of drug using EDM partygoers in New York, 55.5% have attended virtual raves and 69.5% have attended virtual happy hours during COVID-19-related social distancing. Alcohol was the most prevalent substance used during both types of event, followed by cannabis, which was used by 29–30% of participants attending either type of event. Use of illegal drugs other than cannabis was less prevalent, with 18.3% of virtual rave attendees reporting use and 7.9% of virtual happy hour attendees reporting use. Drugs used included ecstasy/MDMA/Molly, cocaine, ketamine, and LSD, and a few instances of use of mushrooms and DMT among those reporting virtual rave attendance. Cannabis, cocaine, ecstasy/MDMA/Molly, ketamine, and LSD are the most prevalent party drugs used by this population in general (Palamar et al., 2019) so it appears that these are among the drugs of choice across party or social settings.

While it is unknown to what extent these participants used various drugs in daily life, results suggest that a subset of EDM partygoers do use drugs during such virtual events. Relatedly, we found that use of more drugs within the past year was associated with increased risk of use of drugs during such an event. Therefore, those with more recent experience using various drugs are more likely to use during these events.

Although research on behavioral aspects of attending virtual events is in its infancy, more research on virtual happy hours in particular is needed, in part, because these events are broadly defined and may vary greatly. More research on virtual raves and happy hours is needed, especially with respect to contexts of drug use behavior. For example, it is unknown if participants attended alone or if they were with others. These factors can have implications for harm reduction as using certain drugs by oneself can be more dangerous in certain circumstances. More research is also needed within general population samples. This study

focused on a high-risk sample of people who have recently used drugs. We suspect that illegal drug use would be less prevalent in general population samples.

Limitations

This sample was limited to EDM partygoers so results may not be generalizable to other populations. Online recruitment and survey methods have many limitations; however, we believe we eliminated many pitfalls of online surveying through our methodology. Although, a particularly high number of females and participants identifying as Asian took the survey which make results less generalizable as EDM partygoers are typically white and male (Palamar et al., 2019). In addition, unweighted prevalence of past-year drug use was higher in this study than in the parent study (e.g., for ecstasy/MDMA/Molly: 59.4% vs. 41.1% (Palamar et al., 2019)). We believe this is due to drug use being required to enroll in this study. Due to strict inclusion criteria to limit mischievous reporters from taking the full survey, the sample size was relatively small. Requiring an email address also likely led to concerns about confidentiality despite the informed consent explaining that data were indeed confidential. We also did not ask about quantity or frequency of drugs used, or the frequency of virtual events attended.

Conclusions

Drug use during virtual raves and happy hours appears to be somewhat prevalent among drug using EDM partygoers. While prevention and harm reduction typically focus on drug use at EDM parties, more research is needed to determine the contexts in which drug use occurs during virtual events. Although use may be “safer” in a home environment, such use may introduce different risks; for example, risks associated with using alone. Policy and public health experts should be aware that drug use is occurring during virtual events as this may provide an opportunity to reach individuals with prevention or harm reduction information.

Declarations of Interest

The authors declare no conflict of interest. The authors alone are responsible for the content and writing of this paper.

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