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“Bath Salt” Use and Beliefs about Use among Electronic Dance Music Attendees

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Abstract

Use of synthetic cathinones (“bath salts”) has been associated with tens of thousands of emergency department visits. Few surveys, however, query use. Research on “bath salt” use is needed, especially in high-risk populations, to inform prevention and harm reduction efforts. A total of 933 adults (ages 18–40) were surveyed entering electronic dance music (EDM) parties in New York City in 2017. Lifetime use of 22 different synthetic cathinones was queried, and agreement with four statements about “bath salts” was also assessed. Prevalence and correlates of self-reported “bath salt” use was examined as well as correlates of beliefs about “bath salts.” An estimated 3.5% of EDM attendees have knowingly used “bath salts.” Almost half (46.7%) believe “bath salts” are more harmful than MDMA, 30.1% believe “bath salts” have turned users into cannibals, 30.0% believe “bath salts” are sometimes found in Molly, and 14.9% believe they might have unknowingly used “bath salts.” Males, those earning <\$500 per week, and those with a college degree were at higher risk for use. Believing “bath salts” have turned users into cannibals, however, was protective against use. Findings suggest the need for more accurate information (e.g., regarding drug effects) on this large and heterogeneous group of compounds.

Keywords

Dance music; MDMA; new psychoactive substances; synthetic cathinones

Introduction

“Bath salts” is a common street name for synthetic cathinones, which are amphetamine-like new psychoactive substances (NPS) (Zawilska and Wojcieszak 2013). The dangers associated with “bath salt” use have been covered extensively by the media; however, coverage has largely been sensational, often referring to users as “zombies” or “cannibals” (ABC News 2012; Carstensen 2016; Scaccia 2016). Fact sheets published by government agencies also tend to state that paranoia, hallucinations, extreme agitation, and violent behavior are common effects associated with use (National Institute on Drug Abuse 2018). While reported assaults in the US involving cannibalism were disproven to involve “bath salts” (CBS News 2016a; Sullum 2016), these drugs are still commonly referred to as

“zombie” or “cannibal” drugs by the media and in popular culture. Despite extensive media coverage, few drug surveys ask about “bath salt” use. Research is needed not only on prevalence and correlates of use, but also to examine beliefs about these compounds and to determine how such beliefs relate to use, as such information can inform prevention.

Synthetic cathinones are a large and heterogeneous class of amphetamine-like compounds derived from cathinone, a stimulant found in the khat plant (Zawilska and Andrzejczak 2015). These compounds induce similar subjective effects to those induced by amphetamine, cocaine, and/or 3,4-methylenedioxymethamphetamine (MDMA, ecstasy, Molly). By 2010, the “first generation” of these compounds (including mephedrone, methylone, and MDPV) began to appear in the drug market in the US (US Drug Enforcement Administration [DEA] 2011). Originally prevalent in Europe and commonly purchased on the dark web, these compounds became commonly referred to as “bath salts” in the US (outside although the US, “bath salts” can refer to various NPS other than synthetic cathinones). As these compounds become illegal in the US, new replacement compounds quickly emerge to take their place (Zawilska and Andrzejczak 2015). For example, in 2013, 72% of “bath salt” seizures in the US consisted of methylone, but in 2015, only 2% of seizures consisted of methylone, which was largely replaced by ethylone (which consisted of 47% of seizures) (US DEA 2016). In 2016, dibutylone was the most commonly seized “bath salt,” but by 2017, *N*-ethylpentylone was the most commonly seized compound in this class (US Drug Enforcement Administration, Diversion Control Division 2016,2017,2018). To date, at least 130 different compounds have been identified throughout Europe, with 12 new compounds first identified in 2017 (European Monitoring Centre for Drugs and Drug Addiction 2018).

With regard to adverse outcomes related to “bath salt” use in the US, in 2011 alone there were over 20,000 emergency department visits related to use (Substance Abuse and Mental Health Services Administration 2013). Likewise, there were 6,137 reported poisonings related to use in the US in 2011; however, reported poisonings substantially decreased to 2,691 in 2012, 995 in 2013, 582 in 2014, 522 in 2015, and 360 in 2016 (American Association of Poison Control Centers 2016). Despite the substantial decrease in reported poisonings, some compounds have been particularly problematic in recent years. For example, alpha-PVP, commonly referred to as Flakka, was linked to over 60 deaths and numerous cases of “bizarre” behavior in Fort Lauderdale, Florida, within a 16-month period between 2015 and 2016 (CBS 2016b). This may be because alpha-PVP is a highly potent compound which is roughly equipotent to methamphetamine, unlike compounds such as methylone, which are less potent (Watterson and Olive 2017), have lower abuse liability, and appear to be associated with fewer poisonings. Of the few survey studies that have investigated prevalence of “bath salt” use, most have determined that use is rare. Monitoring the Future (MTF), an annual nationally representative survey of high school seniors in the US, has found that, from 2012 to 2017, only ~ 1% of high school seniors used “bath salts” in the past year (Miech et al. 2017; Palamar 2015). However, a limitation of the MTF survey is that it does not provide examples of specific “bath salt” compounds. Only 1% of participants in a college sample reported use on a survey that queried use of “bath salts” and MDPV (Miller and Stogner 2014). Likewise, a survey of nightlife attendees found that only 1% reported use on a survey that queried “mephedrone, also known as meph or bath salts” (Kelly et al. 2013). Surveys that have detected higher prevalence of use have focused on

electronic dance music (EDM) party attendees. Specifically, an online survey of past-year, drug-using nightclub attendees in 2013 found that one out of 10 (10%) reported lifetime use of any “bath salt,” with 8% reporting methylone use, 5% reporting mephedrone use, and 2% reporting MDPV use (Palamar et al. 2016b). A survey of EDM party attendees in New York City (NYC) in 2015 focusing on NPS use estimated that 7% of attendees have used at least one of 26 different “bath salt” compounds, with methylone (3%) being the most prevalent (Palamar et al. 2016a).

Higher prevalence of “bath salt” use may not be unexpected among EDM party attendees, as this population is at high risk for use of various drugs. A nationally representative survey of high school seniors in the US, for example, found that rave party attendees were more likely to use 18 different illegal drugs (and more frequently) than non-attendees (Palamar, Griffin-Tomas, and Ompad 2015). Other recent studies have estimated high prevalence of use of drugs such as ecstasy (MDMA, Molly) among attendees of dance festivals and EDM parties (Hughes et al. 2017; Palamar 2018), as such drugs are often used to enhance light shows and electronic music at these gatherings (Collin 2009; White 2014).

Further research is needed to determine prevalence of use in this high-risk scene and to determine demographic, drug use, and belief-related correlates of use in order to inform prevention and harm reduction. This study examined prevalence of self-reported “bath salt” use in this high-risk population, along with beliefs about “bath salts” and correlates of both use and beliefs about “bath salts,” in order to inform prevention and harm reduction.

Methods

Procedure

EDM parties were randomly selected each week to survey attendees using time-space sampling (MacKellar et al. 2007). Recruitment typically occurred on one to two nights per week on Thursday through Sunday. While most parties were held at nightclubs, participants were also surveyed outside of two large daytime festivals, which were not randomly selected. The two festivals were included because one aim of the parent study was to compare festival and nightclub attendees, and festivals in NYC occur too infrequently to skip if not randomly selected. Passersby were eligible if they were (1) ages 18–40; (2) about to enter the randomly selected party; and (3) were not visibly inebriated. Recruiters approached passersby, and if eligible, they were asked if they would like to take a survey about drug use. Surveys were conducted on tablets, and participants provided informed consent on the tablet. A total of 933 participants completed the survey and were compensated \$10 USD. Recruitment was conducted from June through September of 2017 and the response rate was 74%. This study was approved by the New York University Langone Medical Center Institutional Review Board.

Measures

The survey asked about demographic characteristics, such as age, sex, race/ethnicity, weekly income (median-split to <\$500 vs. \$500 per week), educational attainment (median-split to less than a college degree vs. a college degree or higher), and sexual orientation (i.e.,

heterosexual/straight, gay/lesbian, bisexual, other sexuality). Sexual orientation was split into heterosexual vs. non-heterosexual to ensure adequate group sizes for statistical comparisons. Participants were also asked how often in the past year they have attended EDM parties.

Participants were asked about lifetime use of ecstasy/MDMA/Molly, powder cocaine, and nonmedical use of amphetamine and opioids. Participants were also asked whether they had ever knowingly used synthetic cathinones, also known as “bath salts.” It was noted that they were being asked about the drug and not literally salts one may put in his or her bath. The checklist beneath the question included 21 specific compounds (e.g., methylone, mephedrone) and an item for “bath salt” unknown or not listed. Responses were collapsed into a variable indicating whether or not any “bath salts” were reportedly used. Participants were also asked their level of agreement with the following statements: (1) “Bath salts” have turned users into cannibals; (2) “Bath salts” are sometimes found in Molly; (3) “Bath salts” are more harmful than MDMA; and (4) I might have used “bath salts” unknowingly. Response options were strongly agree, agree, not sure, disagree, and strongly disagree, and were dichotomized into agree (strongly agree or agree) vs. all other responses.

Analysis

First, prevalence of self-reported “bath salt” use was estimated—for any “bath salt” use and for use of each individual “bath salt” compound—and then descriptive statistics were examined for all other variables. Crosstabulations were computed to examine proportions within each covariate regarding reported “bath salt” use, and then all covariates were fit into a multivariable binary logistic regression model to determine associations of each covariate with all else being equal. Therefore, each level of each covariate was associated with an adjusted odds ratio (AOR). Multivariable models were then computed to determine potential differences regarding sample characteristics and agreement with each of the four statements about “bath salts” as outcome variables. Since outcomes were prevalent, a generalized linear model using Poisson and log link was used for each separate model. Models generated adjusted prevalence ratios (APRs) for each level of each covariate.

Selection probabilities were computed and composed of: (1) frequency of EDM party attendance; and (2) party-level response rates. For the attendance component, weights were inversely proportional to frequency of attendance. For the response rate component, weights were inversely proportional to the party-level response rate. The two weight components were combined via multiplication and normalized. This upweighting of respondents believed to have a lower probability of selection and down-weighting of respondents believed to have a higher probability of selection has been used in other studies using venue-based sampling (Jenness et al. 2011; MacKellar et al. 2007). These probability weights were used in all analyses to account for differential selection probability and clustering of participants within each party. Data were analyzed using Stata 13 SE using “svy” commands and Taylor series estimation to obtain accurate standard errors (Heeringa, West, and Berglund 2010) with randomly selected party specified as the primary sampling unit.

Results

An estimated 3.5% (95% CI: 2.0, 6.1) of EDM attendees have knowingly used “bath salts.” As shown in Table 1, of those reporting “bath salt” use, over a third (34.7%) reported use of ethylone, followed by “bath salt” unknown or not listed (30.4%), methylone (20.5%), mephedrone (9.0%), 4-MEC (7.2%), methcathinone (3.7%), 4-FMC (3.3%), 3,4-DMMC (2.9%), and 3-MMC (1.3%). Almost half (46.7%) of the sample agreed that “bath salts” are more harmful than MDMA, 30.1% agreed that “bath salts” have turned users into cannibals, 30.0% agreed that “bath salts” are sometimes found in Molly, and 14.9% agreed that they might have unknowingly used “bath salts.”

Table 2 presents sample characteristics, and these characteristics as they relate to self-reported “bath salt” use. Attendees who were male (AOR = 6.24, $p = .003$), Hispanic (AOR = 2.51, $p = .015$), earn \$500 per week (AOR = 3.60, $p = .022$), have a college degree or higher (AOR = 3.61, $p = .025$), and identify as gay/bisexual or other sexuality (AOR = 3.33, $p = .030$) were all at increased odds of reporting “bath salt” use. Reporting nonmedical use of amphetamine (AOR = 6.78, $p < .001$) or opioids (AOR = 10.21, $p = .003$) was also a risk factor for reporting “bath salt” use, as was agreeing that “bath salts” are sometimes found in Molly (AOR = 3.49, $p = .013$) and reporting that “bath salts” might have been used by the attendee unknowingly (AOR = 12.85, $p < .001$). Compared to White attendees, Black attendees (AOR = 0.09, $p = .021$) were at low odds for reporting use, as were those who agreed that “bath salts” are more harmful than MDMA (AOR = 0.07, $p < .001$) or that “bath salts” have turned users into cannibals (AOR = 0.24, $p = .026$).

Associations between sample characteristics and agreement with each of the four statements about “bath salts” are presented in Table 3. Younger participants (ages 25–40; APR = 1.55, $p = .002$) and ecstasy users (APR = 1.49, $p = .014$) were more likely to agree that “bath salts” have turned users into cannibals, and those earning <\$500 per week (APR = 0.63, $p < .001$) and users of “bath salts” (APR = 0.32, $p = .023$) were less likely to agree with this statement. Younger participants (APR = 1.71, $p = .002$) were more likely to agree that “bath salts” are sometimes found in Molly, and gay/lesbian and participants of other sexuality (APR = 0.63, $p = .027$) were less likely to agree with this statement. Younger participants (APR = 1.40, $p = .037$) and users of ecstasy (APR = 1.46, $p = .010$) and amphetamine (APR = 1.52, $p = .002$) were more likely to agree that “bath salts” are more harmful than MDMA. Asian participants (APR = 0.61, $p = .019$), as well as users of “bath salts” (APR = 0.57, $p = .006$), were less likely to agree with this statement. Finally, younger participants (APR = 1.89, $p = .002$), users of powder cocaine (APR = 1.82, $p = .025$), and users of “bath salts” (APR = 2.63, $p < .001$) were more likely to agree that they might have unknowingly used “bath salts.”

Discussion

In this study, an estimated 3.5% of EDM attendees in NYC have knowingly used “bath salts.” This estimate is only half of the prevalence estimate derived from a similar study of the EDM population in NYC conducted in 2015, which estimated prevalence of use to be 7% (Palamar et al. 2016a). Thus, it appears that known “bath salt” use has decreased in this

population. However, this is still a high-risk scene for use, as this estimate is still higher than estimates of 1% in studies of other populations (Kelly et al. 2013; Miech et al. 2017; Miller and Stogner 2014; Palamar 2015).

Ethylone was the most prevalent “bath salt” reportedly used in this sample (used by over a third of “bath salt” users), and this is consistent with seizure data. Ethylone was the most common “bath salt” seized in the US in 2015, accounting for nearly half of such seizures (US Drug Enforcement Administration 2016). Similarly, methylone use was prevalent among “bath salt” users in this sample with a fifth reporting use of this compound, and methylone was also the most confiscated “bath salt” in 2013 and 2014 (US Drug Enforcement Administration 2016). Thus, seizure data may relate directly to prevalence of use of specific compounds in the US.

Prevalence estimates derived from this study, however, may be underestimates, as self-reported use only refers to known use, and not unknown use. This is important to note, as previous studies have found that 40% of ecstasy users in this population have unknowingly used “bath salts” since these compounds are common adulterants in ecstasy (Mohr et al. 2017, Palamar et al. 2016b, 2017). It is also unknown how many individuals who reported using did so intentionally or whether they later found out or suspected using such compounds, as they could have been present in another drug used, such as ecstasy. In fact, 14.9% of those surveyed reported that they might have unknowingly used “bath salts” and those reporting “bath salt” use were more likely to report potential unknown use.

Males were at higher odds for known “bath salt” use and this may be unsurprising, considering that males tend to be at higher risk for using various drugs (Johnston et al. 2018) and previous studies have found that males who attend nightclubs are also more likely to use “bath salts” than females (Palamar et al. 2016b). Individuals identifying as non-heterosexual were found to be at higher risk for reporting known use and previous studies have found that gay and bisexual individuals tend to be at higher risk for use of ecstasy, cocaine, methamphetamine, ketamine, and GHB (Corliss et al. 2010; Roxburgh et al. 2016). However, non-heterosexual attendees were less likely than heterosexual attendees to agree that “bath salts” are often found in Molly. Therefore, education about high incidence of adulteration of ecstasy/Molly may need to be geared toward non-heterosexual individuals who use ecstasy.

This study also found that Black attendees were at low risk for use and Hispanic attendees were at high risk for use. Further research may explore whether higher use among Hispanic attendees has been intentional or unintentional, because previous studies have found that non-White ecstasy-using EDM attendees are more likely to have their hair test positive for “bath salts” after denying use (Palamar et al. 2016c, 2017a). Further research is also needed regarding risk related to socioeconomic status, as income and education associations were in opposite directions. Specifically, those with higher education were more likely to report use, and those with lower income were also more likely to report use.

Other drug use was also a major risk factor for “bath salt” use in this study. Nonmedical users of amphetamine and opioids were more likely than non-users to report “bath salt” use, and cocaine users were also more likely to report potential unintentional use of these

compounds. This may be expected, as previous studies have found that psychostimulant users who use NPS tend to prefer compounds with similar effects to the more common drugs they use (Sutherland et al. 2016), and other studies focusing on the EDM scene have found that “bath salt” users also tend to use a variety of other stimulants (Fernandez-Calderon, Cleland, and Palamar 2017).

With regard to perceived risk, almost half of attendees believe “bath salts” are more harmful than MDMA, and this belief was particularly prevalent among ecstasy and amphetamine users. Those reporting “bath salt” use, however, were less likely to agree that “bath salts” are more harmful than MDMA. It was not explored whether such beliefs existed prior to use or were formed in response to use. These results are important because perception of risk tends to be a protective factor against use (Lipari et al. 2016) and low perception of risk can indicate susceptibility to use. In nationally representative samples of US high school seniors, perceived risk associated with trying “bath salts” has fluctuated. In 2013, only a third (33%) of high school seniors believed trying “bath salts” places a user at risk, but in 2014, perception of risk increased to 60%, and has remained above 50% through 2017 (Johnston et al. 2018). Among high school seniors, in 2017, prevalence of perceived risk associated with trying “bath salts” (51%) was similar to that of ecstasy (49%), higher than LSD (30%) and synthetic cannabinoids (33%), and lower than heroin (63%) and methamphetamine (69%) (Johnston et al. 2018). Another study of EDM attendees found that participants rated “bath salts” as riskier to use than other NPS classes (Palamar, Acosta, and Cleland 2018). However, in this study and in other studies, it is unknown whether these comparisons of perceived risk are based on drug education, experience, or simply based upon media coverage and/or other hearsay about the effects of “bath salts.”

Indeed, some “bath salts,” such as alpha-PVP, are particularly potent and have been associated with numerous deaths and accounts of “bizarre” behavior, as has been covered by the media (CBS News 2016b). However, it appears that much of the public is unaware that “bath salts” refers to a large group of compounds with heterogeneous effects; therefore, some compounds within this class are likely riskier or more harmful than others. Some compounds (e.g., alpha-PVP, MDPV) are about equipotent to methamphetamine (Watterson and Olive 2017) and mephedrone has been found to have higher abuse liability than MDMA (Papaseit et al. 2016). Methylone, which is less potent than alpha-PVP and MDPV, has effects comparable to MDMA, and although it has been found to be a stronger reinforcer than MDMA, it has also been found to have weaker rewarding properties (Watterson et al. 2012). Therefore, it appears that some “bath salt” compounds are potentially more dangerous than MDMA (e.g., with regard to potency and compulsive use), and others may be equal or less dangerous. It appears that adverse outcomes and “bizarre” instances of behavior associated with a particular “bath salt” compound are likely deemed effects of “bath salts” in general by the public. More education is needed regarding the wide variety of compounds in this class, as well as the wide range of effects.

Limitations

Since this study was limited to the high-risk EDM scene in NYC, results are not fully generalizable outside of this population. Further, this study examined self-reported use and

was unable to determine unknown or unintentional use of “bath salts” as adulterants. Many individuals are also unaware that various drugs (e.g., methylone) are in fact “bath salts,” so this could have affected responses. However, the survey asked about 22 different compounds including “bath salts” unknown or not listed, and these were classified into use vs. non-use of any. While study staff sought to exclude inebriated participants, tests for inebriation were not conducted. It is possible that some individuals were in fact inebriated. No one was excluded for being inebriated after being approached or giving informed consent. However, not approaching individuals who are visibly inebriated could also affect prevalence estimates.

Conclusions

This study focused on known use in a high-risk population—EDM party attendees—and an estimated 3.5% of such attendees in NYC have ever knowingly used these compounds. It is likely that prevalence estimates of known use outside of this scene are underestimates, as the few surveys that have queried “bath salt” use have tended to omit examples of specific compounds or not ask about specific compounds. This is further complicated by the fact that many individuals who have knowingly used a specific “bath salt” compound (such as methylone) may be unaware that the compound they used is in fact a “bath salt” (Palamar et al. 2017b). Future studies that query “bath salt” use should consider the large variety of compounds within this class.

Investigators researching “bath salt” use should also consider that much “bath salt” use appears to be unintentional or unknown among users (Mohr et al. 2017; Palamar et al. 2016c, 2017). A common harm reduction practice among ecstasy users is drug checking (Barratt et al. 2017), which allows users to deduce whether the substance they are about to use contains MDMA and/or other drugs (including “bath salts”). Since various “bath salt” compounds appear to be more dangerous than ecstasy, more widespread use of such testing is needed to test for adulterants among those who insist on using drugs such as ecstasy.

Findings from this study can inform prevention and harm reduction efforts inside and outside of this scene. However, while believing misinformation about “bath salts” (e.g., that use has turned individuals into cannibals) was found to be protective against use, it may be inappropriate to rely on this information to prevent use. It may be most beneficial to utilize prevention education that limits stigmatizing misinformation while still providing information about associated risk. While “reefer madness” style scare tactics may help prevent use, they tend to add to a wealth of misinformation about this large, heterogeneous, and constantly expanding class of compounds. Better education about this drug class is needed in order for individuals to be able to make informed decisions regarding use and to be more compassionate to those who have used and may become stigmatized as a result.

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Table 1.

Prevalence estimates of “bath salt” use in the New York City EDM scene.

	Within “Bath salt” Users (<i>N</i> = 58) % (95% CI)	Full Sample (<i>N</i> = 933) % (95% CI)
Any “bath salt”	-	3.5 (2.0, 6.1)
Ethyl one	34.7 (15.0, 61.4)	1.0 (0.0, 3.3)
“Bath salt” unknown or not listed	30.4(16.3, 49.4)	1.1 (0.5, 2.1)
Methylone (M1)	20.5 (8.9, 40.5)	1.0 (0.0, 1.7)
Mephedrone (MCAT, Meow Meow, Drone)	9.0 (2.9, 24.8)	0.0 (0.0, 1.0)
4-MEC	7.2 (1.0, 37.2)	0.3 (0.0, 1.9)
Methcathinone (Cat, Jeff)	3.7 (1.1, 11.5)	0.1 (0.0, 0.5)
4-FMC	3.3 (0.6, 15.3)	0.0 (0.0, 0.6)
3,4-DMMC	2.9 (0.7, 11.6)	0.0 (0.0, 0.6)
3-MMC	1.3 (0.3, 6.4)	0.0 (0.0, 0.2)
Metamfepramone	0.9 (0.2, 4.1)	0.0 (0.0, 0.0)
Methedrone	0.9 (0.2, 4.0)	0.0 (0.0, 0.0)
Butylone (Bl)	0.8 (0.2, 3.4)	0.0 (0.0, 0.0)
Ethcathinone (E-Cat, Eth-Cat)	0.6 (0.0, 4.8)	0.0 (0.0, 0.0)
3-FMC	0.6 (0.0, 4.4)	0.0 (0.0, 0.2)
Alpha-PVP (Flakka)	0.6 (0.0, 4.4)	0.0 (0.0, 0.0)
Buphedrone	0.3 (0.0, 2.8)	0.0 (0.0, 0.0)
MPBP	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
MDPPP	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
MDPV	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
Pentylone	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
3-MEC	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)
4-Methylbuphedrone	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)

Note. CI = confidence interval. Any “bath salt” use indicates that the participant reported lifetime use of any of the specific 22 compounds (including “bath salts” unknown or not listed).

Table 2.

Sample characteristics and correlates of self-reported “bath salt” use.

	Full Sample (N = 933), %	No Bath Salt Use (n = 875), %	Bath Salt Use (n = 58), %	AOR	95% CI
Sex					
Female	48.4	98.0	2.0	1.00	
Male	51.6	95.2	4.8	6.24**	(1.96, 19.86)
Age					
25–40	54.3	96.3	3.7	1.00	
18–24	45.7	96.8	3.2	2.01	(0.64, 6.37)
Race/Ethnicity					
White	52.4	95.9	4.1	1.00	
Black	7.5	99.6	0.4	0.09*	(0.01, 0.68)
Hispanic	19.9	96.5	3.5	2.51*	(1.21, 5.21)
Asian	13.7	95.9	4.1	3.64	(0.80, 16.67)
Other/Mixed	6.5	99.7	0.3	0.13	(0.01, 1.73)
Weekly Income					
\$500	50.0	97.4	2.6	1.00	
<\$500	50.0	95.7	4.3	3.60*	(1.21, 10.67)
Education					
Less than 8A	43.7	97.2	2.8	1.00	
BA or higher	56.3	96.0	4.0	3.61*	(1.18, 11.06)
Sexual Orientation					
Heterosexual	83.5	97.1	6.3	1.00	
Non-Heterosexual	16.5	93.7	2.9	3.33*	(1.13, 9.83)
Lifetime Drug Use					
Ecstasy	50.1	94.7	5.3	0.44	(0.13, 1.41)
Powder Cocaine	33.8	92.8	7.2	1.99	(0.73, 5.40)
Amphetamine (nonmedical)	24.5	90.8	9.2	6.78***	(3.71, 12.38)

	Full Sample (<i>N</i> = 933), %	No Bath Salt Use (<i>n</i> = 875), %	Bath Salt Use (<i>n</i> = 58), %	AOR	95% CI
Opioids (nonmedical)	24.0	88.8	11.2	10.21 ^{**}	(2.36, 44.23)
Agree with Statements about Bath Salts					
They have turned users into cannibals	30.1	98.8	1.2	0.24 [*]	(0.07, 0.84)
They are sometimes found in Molly	29.6	93.8	6.2	3.49 [*]	(1.32, 9.20)
They are more harmful than MDMA	46.7	97.0	3.0	0.07 ^{***}	(0.02, 0.23)
Might have unknowingly used them	14.9	86.8	13.2	12.85 ^{***}	(3.80, 43.46)

Note. Column percentages are presented in the column for the full sample and row percentages are provided in the columns indicating whether or not "bath salt" use was reported. AOR = adjusted odds ratio, CI = confidence interval.

**p* < .05;

***p* < .01;

****p* < .001.

Table 3.

Adjusted models examining participant characteristics in relation to agreement with statements about “bath salts” ($N = 933$).

	Bath salts have turned users into cannibals		Bath salts are sometimes found in Molly		Bath salts are more harmful than MDMA		I might have unknowingly used bath salts	
	APR	(95% CI)	APR	(95% CI)	APR	(95% CI)	APR	(95% CI)
Sex								
Female	1.00		1.00		1.00		1.00	
Male	0.95	(0.71, 1.27)	1.10	(0.85, 1.42)	1.25	(0.96, 1.63)	1.56	(0.96, 2.53)
Age								
25–40	1.00		1.00		1.00		1.00	
18–24	1.55**	(1.19, 2.03)	1.71**	(1.23, 2.39)	1.40*	(1.02, 1.92)	1.89**	(1.29, 2.77)
Race/Ethnicity								
White	1.00		1.00		1.00		1.00	
Black	1.34	(0.78, 2.29)	0.71	(0.35, 1.47)	1.02	(0.62, 1.67)	0.51	(0.15, 1.72)
Hispanic	1.43	(0.96, 2.13)	0.80	(0.58, 1.10)	1.20	(0.96, 1.51)	0.72	(0.45, 1.16)
Asian	0.65	(0.39, 1.06)	0.54	(0.29, 1.01)	0.61*	(0.41, 0.92)	0.41	(0.12, 1.43)
Other/Mixed	1.16	(0.55, 2.44)	0.62	(0.26, 1.50)	1.08	(0.68, 1.70)	0.76	(0.25, 2.31)
Weekly Income								
\$500	1.00		1.00		1.00		1.00	
<\$500	0.63***	(0.50, 0.79)	0.86	(0.62, 1.20)	0.95	(0.77, 1.17)	0.76	(0.44, 1.30)
Education								
< College Degree	1.00		1.00		1.00		1.00	
College Degree	0.97	(0.72, 1.31)	0.97	(0.76, 1.25)	1.23	(0.96, 1.58)	1.02	(0.54, 1.93)
Sexual Orientation								
Heterosexual	1.00		1.00		1.00		1.00	
Non-Heterosexual	0.98	(0.67, 1.41)	0.63*	(0.42, 0.95)	0.97	(0.76, 1.24)	0.83	(0.43, 1.58)
Lifetime Drug Use								
Ecstasy	1.49*	(1.09, 2.03)	1.29	(0.94, 1.78)	1.46*	(1.10, 1.93)	1.86	(0.97, 3.57)
Powder Cocaine	0.96	(0.67, 1.39)	1.12	(0.76, 1.65)	0.98	(0.72, 1.32)	1.82*	(1.08, 3.05)
Amphetamine	1.07	(0.72, 1.59)	1.05	(0.69, 1.60)	1.52**	(1.18, 1.95)	1.07	(0.68, 1.69)

	Bath salts have turned users into cannibals		Bath salts are sometimes found in Molly		Bath salts are more harmful than MDMA		I might have unknowingly used bath salts	
	APR	(95% CI)	APR	(95% CI)	APR	(95% CI)	APR	(95% CI)
Opioids	1.02	(0.71, 1.45)	1.42	(0.99, 2.04)	1.18	(0.95, 1.47)	1.04	(0.68, 1.57)
Bath Salts	0.32 *	(0.12, 0.84)	1.40	(0.91, 2.16)	0.57 **	(0.38, 0.84)	2.63 ***	(1.73, 4.01)

Note. Amphetamine and opioid use refer to nonmedical use. APR = adjusted prevalence ratio, CI = confidence interval.

* $p < .05$;

** $p < .01$;

*** $p < .001$.