

# Gay men who engage in substance use and sexual risk behaviour: a dual-risk group with unique characteristics

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**Summary:** ‘Recreational’ substances used among men having sex with men, and their association with risky unprotected anal intercourse (RUI) were examined – for the first time in Israel – in an internet-based questionnaire assessing knowledge, practices and motivation. Between March and May 2005, 2873 participants completed the entire questionnaire. Of the total, 669 (23%) reported RUI during the last six months, and 1319 (46%) used substances during sex. Use of substance was significantly higher among those performing RUI than those who did not (31.5% versus 26.4%,  $P = 0.03$ ). Involvement in both substance use and RUI was reported by 366 participants (13%). HIV rates were higher in this dual-risk group ( $P < 0.01$ ), and individuals reported more partners in the last six months than those not part of this dual risk (11.6 versus 8.2,  $P = 0.02$ ). In multivariate analyses, Tel-Aviv residency, lower education, performing receptive RUI, misperception of HIV transmission and limited negotiation skills were positively associated with this dual-risk behaviour.

**Keywords:** Internet, Israel, men having sex with men, sexual behaviour, substances

## INTRODUCTION

The annual number of newly diagnosed HIV/AIDS infections among men who have sex with men (MSM) in Israel has doubled between 1999 and 2006, as well as the portion of all new Israeli HIV/AIDS cases<sup>1</sup> attributed to MSM. These data are in concordance with the reports from North America, Australia and Europe regarding increased prevalence of unprotected sex and the resurgence in sexually transmitted diseases (STD) and HIV among MSM.<sup>2,3</sup> This rise emphasizes the need to understand the current sexual patterns and concomitant behaviours that contribute to the spread of STD and HIV among people at risk.

Substance use during sexual intercourse is a recognized risk factor<sup>4</sup> as it may affect decision-making and result in risky sexual behaviour.

Alcohol in excessive quantities results in decreased attention to social norms and mutes self-monitoring,<sup>5,6</sup> particularly with the non-primary partner.<sup>7</sup> Club drugs, such as methylenedioxy-methamphetamine (MDMA, ecstasy), methamphetamine (crystal), gathinone (Gat), gamma hydroxybutyrate and Ketamine (special K), are dissociative hallucinogens and produce a euphoric state. Sildenafil citrate (Viagra), which is the most common erectile dysfunction drug in Israel, may modify sexual function and is associated with unprotected

sexual behaviour.<sup>8</sup> Many studies reported frequent and increased use of drugs among both HIV-positive and -negative MSM.<sup>5–11</sup> MSM may be exposed to social norms of drug use in gay-oriented venues and in circuit parties,<sup>12,13</sup> where substances have become a structural element and therefore present a continuous effect on sexual behaviour.

Owing to the growing concern regarding the increase in HIV burden among gay men in Israel and limited data on sex behaviour among Israeli MSM, we conducted an internet-based study to identify the extent of behavioural risk factors, and to explore the behaviours’ associations with substance use in a predominantly non-Christian and pluralistic society.

## METHODS

### Electronic questionnaire

An internet-based, anonymous questionnaire assessing knowledge, motivation and practices regarding HIV/AIDS and safe sex was developed by the Israeli Ministry of Health in collaboration with a national gay community organization in Israel. This was a tailored, ‘adaptive’ questionnaire, which was designed to alter the sequence of its questions as a consequence of the participant’s responses regarding meeting habits and sexual practices. Participants thus, were asked between 37 and 75 questions, depending on their type of partner, sexual practices and risk profile.

Following a pilot-test phase, the questionnaire was electronically launched and advertised in Israeli gay-oriented internet

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sites, gay venues promotions and general press releases. The purpose of the study was stated at the first electronic page of the questionnaire and participants were asked to agree to the terms before completion.

### Recruitment and eligibility

Participants were recruited between March and May 2005. Inclusion criteria were male gender, having had sex with men, age of 16 years or older, and currently living in Israel. Before analysis, we disregarded inconsistent or highly improbable responses (such as an 18-year-old participant who reported having a PhD degree). Sexual intercourse was defined as an oral or an anal intercourse with another male during the last six months.

The electronic system established to support the questionnaire could identify duplicate responses from the same computer line by analysing 'cookie' information. Cases with several responses were recorded from the same browser; the system chose the first fully completed entry.

### Substance use

Participants were asked to indicate whether they used any substances right before or while having sex during the last six months: alcohol, marijuana, cocaine, D-lysergic acid diethylamide (LSD), MDMA, methamphetamine, nitrites, gathinone, ketamine and Viagra. If participants responded positively, they were asked to specify the type of substance(s) used.

Participants were divided into two groups: those who had been using any of the substances during sex in the last six months, and those who had not, regardless of the frequency of the substance use.

### Sexual risk behaviour

Participants were also asked to report their involvement in risky unprotected anal intercourse (RUAI) in the last six months. RUAI was defined as anal intercourse without a condom between HIV serodiscordant couple; or anal intercourse without a condom and without knowing the HIV status of the sexual partner. No differentiation was made between insertive or receptive anal intercourse.

### Demographics

Besides sociodemographic characteristics, participants were asked to indicate whether they had steady or casual partners in the last six months. A steady partner was defined as a sexual partner whom they meet on a stable basis or whom they identify as boyfriends, even if those relationships were not monogomal. A casual partner was defined as a 'one night stand' or a sexual partner with whom the relationship has not been defined.

Age was clustered into categories of 10 years, except in the case of the youngest age group. The youngest age group (16–21) was determined as ending at the age at which men in Israel are normally discharged from compulsory military service, as we believe them to share similar social and behavioural characteristics.

Education level of participants was classified into higher education if they have or are working towards a university degree, or completed boarding school.

Income level of participants was classified into higher income if the reported earning exceeded the average salary in Israel.

Participants indicated whether they were tested for HIV, and had the options of checking whether they are HIV-positive, -negative or choosing not to disclose.

### Knowledge, motivation and practices

We measured participants' knowledge of HIV transmission, motivation to use condoms and sexual practices. Responses to questions regarding knowledge, attitudes about sex, comfort with condom use and perceptions about HIV transmission were grouped in respective clusters by exploratory factor analysis (principal components extraction and Promax rotation), and reduced to summary variables for analysis. The exploratory factor analysis assumes that the responses to items on a survey are correlated because each of the items is measuring an underlying, 'latent' construct. For example, questions about condoms dislike, ability to enjoy sex with condoms and condoms as interfering with sexual function are correlated because they are related to a construct that we may call 'condom attitudes.' Using principal components extraction, we discover the underlying constructs in the observed data; using Promax rotation, we discover how the underlying constructs are related to one another. This method allows attributes to be reduced to summary variables for analysis. For example, all the questions regarding condom use, such as 'I do not enjoy sex with condom', 'condom breaches the intimacy between my partner and myself', 'I do not have erection when I see a condom', 'I am sick of using a condom', were grouped and weighted. If a participant responded correctly to the questions, or in a manner indicating safer sex (for questions of attitudes and condom use), he received a positive grade and a negative if the response indicated poor knowledge or high-risk behaviour. Each participant was further evaluated at two levels: the first is the number of correct/wrong answers and the second is the correlation between the different responses in the same group. Thus, more correct answers to questions in the same group, and better correlations between the answers, resulted in higher scores. After establishing a nominal scale for knowledge and motivation, we dichotomized each scale to indicate the preferred attitude (those who like condom use, negotiate well, demonstrate acceptable knowledge and perceive dangers) by a median split.

### Statistics

In order to evaluate sexual practices, substance use and the correlations between the two behaviours in this cross-sectional survey, a univariate analysis was performed using two-sided chi-squared test for categorical variables or Student's *t*-test for continuous variables. Multivariate analysis was performed for variables with significant relationships in univariate analysis using logistic regression (backward) for dichotomous outcome variables.

## RESULTS

During the study period, 11,089 entries to the internet site were recorded. Of those, 4038 identified themselves as MSM. Following exclusion of incomplete, inconsistent, duplicative or highly improbable responses, we analysed all the 2873 fully completed questionnaires.

### Demographics characteristics of all participants

Of all eligible participants, average age was 26.6 years (standard deviation = 7.3, range: 16–62), 1867 (65%) had higher education, 1896 (66%) were residing in Tel-Aviv, 2585 (90%) were born in Israel, 2755 (96%) were Jews, 2528 (88%) were engaged exclusively in MSM sexual activities and 345 (12%) were engaged in sex with both men and women. Male-to-male sexual attraction was indicated by 2670 (93%) and bisexual attraction was indicated by 203 (7%). Nineteen participants (1%) reported that they were HIV-infected.

### Substance use

Out of all 2873 responses, 1319 (46%) used at least one of the substances listed in during the last six months, 1512 (52.5%) did not use any substances and 42 (1.5%) preferred not to respond to substance-use questions. Of all the substances, alcohol was the most commonly used (47%, 622/1319), followed by marijuana (28%, 372/1319), nitrites inhalant (27%, 354/1319), sildenafil-citrate (11%, 139/1319) and MDMA (9%, 113/1319). Use of two or more substances was reported by 433 (32.8%) users.

A 'typical substance user' was likely to be 16–30 years, lived alone (without a roommate) in Tel-Aviv area and was in a steady relationship (Table 1). Demographic determinants and behavioural attributes were compared between those who used substances and those who did not. Substance users reported having first sexual intercourse at an earlier age, had more sexual partners in the last six months and performed receptive sexual intercourse more frequently with casual partners than those who did not use drugs ( $P < 0.03$ ).

### MSM who perform RUAI

RUAI was described by 669 participants during the last six months. Of those, 97% (649/669) replied to the questions about substance use. The use of most substances was significantly more prevalent in those who performed RUAI (Table 2).

### Involvement in both substance and RUAI

This dual-risk behaviour during the last six months was reported by 13% of all participants (366/2873). The 'typical substance user who involved in RUAI' was 31–40 years of age, an Israeli-born Jew, who was living alone in Tel-Aviv, had relatively lower education and had frequent casual partners despite having a steady relationship (Table 3). In clustering questions regarding knowledge and attitudes, it was found that this dual-risk group reported disliking condoms, had lesser negotiation skills and lower knowledge of HIV risks. Larger proportion of participants from this dual-risk group reported that they were HIV-infected than those who were not part of the dual-risk members (13 versus 6,  $P < 0.01$ ). The internet and gay clubs/bars were indicated by this group to be the preferred venues to meet sexual partners.

In multivariate analyses, living alone in Tel-Aviv, performing receptive anal sex with a large number of casual partners in the last six months, low income, disliking condoms, limited negotiation skills and knowledge regarding HIV transmission were found to be predictive of involvement in both substance and RUAI,  $R^2 = 0.21$  (Table 4). Protective variables found were education and sharing a household with a steady partner.

## DISCUSSION

Substance use was associated with RUAI among participants in this first large-scale internet study of MSM in Israel. Alcohol was the most commonly used substance, followed by marijuana, nitrites, sildenafil citrate and MDMA. Substance use in our study was strongly associated with RUAI and other high-risk sexual behaviours, which is consistent with other publications studying the influence of both alcohol<sup>14</sup> and drugs<sup>15,16</sup> on sexual practices.

Table 1 Characteristics of participants who use substances in comparison with those who do not use substances in the last six months

	No.	Use substance	Do not use substance	P
Has a steady partner/s	1456	716/1319 (54.3%)	740/1512 (48.9%)	0.02
Has a casual partner/s	1178	551/1319 (41.8%)	627/1512 (41.5%)	0.88
Higher education	1478	699/1319 (53%)	779/1512 (51.5%)	0.45
Lives alone (without a roommate)	682	371/1319 (28.1%)	311/1512 (20.6%)	<0.01
Bisexual	341	151/1319 (11.4%)	190/1512 (12.6%)	0.38
Age 16–21	696	229/1319 (22.1%)	467/1512 (30.9%)	<0.01
Age 22–30	1418	726/1319 (55%)	692/1512 (45.8%)	<0.01
Age 31–40	507	252/1319 (19.9%)	255/1512 (16.9%)	0.13
Tel-Aviv residency	1860	940/1319 (71.3%)	920/1512 (60.8%)	<0.01
Self-description as a risk taker	422	261/1319 (19.8%)	161/1512 (10.5%)	<0.01
Ever been tested for HIV	1849	971/1319 (73.6%)	878/1512 (58.1%)	<0.01
Provided commercial sex	274	175/1319 (13.3%)	99/1512 (6.5%)	<0.01
Used commercial sex	306	148/1319 (11.2%)	158/1512 (10.4%)	0.54
Age for first MSM intercourse	2831	16.5 ± 0.1	17.38 ± 0.12	<0.01
Number of casual partners in the last six months	2831	9.5 ± 0.3	7.5 ± 0.23	<0.01

MSM = Men having sex with men

Table 2 Type of substance used among MSM who practice RUI and MSM who do not practice RUI during the last six months

Substance	No. of participants who used the substance	RUI		P
		RUI	Non-RUI	
Alcohol	617	195/358 (54.5%)	422/959 (44%)	0.01
Marijuana	368	130/347 (37.5%)	238/933 (25.5%)	<0.01
Cocaine	70	29/325 (8.9%)	41/890 (4.6%)	0.04
LSD	12	5/320 (1.6%)	7/882 (0.8%)	0.32
Speed (MDMA)	28	12/321 (3.7%)	16/887 (1.8%)	0.05
XTC (methamphetamine)	112	47/235 (14.5%)	65/893 (7.3%)	<0.01
Poppers (nitrites inhalant)	348	140/350 (40%)	208/914 (22.8%)	<0.01
Gathinone (Gat)	114	40/238 (12.2%)	74/898 (8.2%)	0.04
Special K (Ketamine)	35	14/322 (4.3%)	21/885 (2.4%)	0.81
Viagra (sildenafil-citrate)	137	54/328 (16.5%)	83/894 (9.3%)	0.01

MSM = Men having sex with men; RUI = Risky unprotected anal intercourse; LSD = D-lysergic acid diethylamide; MDMA = methylenedioxy-methamphetamine

Study participants who used substances were younger than those who did not, were involved in high-risk sexual practices, reported multiple sex partners and had misperceptions regarding HIV transmission. They did, however, reported being tested for HIV more often, but it is unknown whether they tested themselves prior to or following the risky sexual phase. Many of those who used substances reported having a steady partner, but were concomitantly involved in high-risk sexual practices with casual partners. This issue raises the possibility of HIV and other STDs infections, acquired from a casual partner outside the relationship, and further transmitted to the steady partner.<sup>17</sup> Therefore, increased efforts for sexual health education should target gay men in steady relationships

in Israel to employ risk-reduction strategies, such as improving negotiation skills within the relationships, as well as consistent and correct use of protection with the casual partners. Encouraging monogamous relationships with the steady partner may be another approach to decrease the possibility of inter-relationships transmission.<sup>18</sup>

A dual-risk group, which used substances and concomitantly engaged in RUI, was identified among all participants. This group reported the highest risk behaviour, which included numerous partners, both for recreation and for pay. Although a small number of participants reported they were HIV-infected, a larger proportion was found among the dual-risk group, stressing the fact that those individuals were

Table 3 Univariate analysis of characteristics of participants who are involved both in RUI and substance use in comparison with participants who do not use substances or do not perform RUI in the last six months

Item	No.	Use substances and RUI	Do not use substance/RUI	P
Age 31–40	493	83/366 (22.7%)	410/2342 (15.1%)	0.02
Tel-Aviv residency	1178	267/366 (73%)	1511/2342 (64.5%)	0.05
College degree of higher*	1371	164/366 (44.8%)	1259/2342 (53.8%)	0.02
Lower income level*	1260	152/366 (43.1%)	1108/2342 (50.2%)	0.01
Lives alone†	651	115/366 (31.4%)	536/2342 (22.9%)	0.01
Lives with steady partner*	396	39/366 (10.7%)	357/2342 (15.2%)	0.01
Having had a steady partner in the last six months	1466	228/364 (62.6%)	1238/2342 (52.9%)	0.01
Having had a casual contact/s in the last six months	2053	355/366 (97%)	1698/2342 (72.4%)	<0.01
Involves both in steady relations and concomitantly in sex with casual partner/s	505	130/366 (35.5%)	375/2342 (16.6%)	<0.01
Performs receptive anal sex with casual partner	1401	219/366 (60%)	1182/2343 (50.4%)	<0.01
Performed HIV tests in the last six months	1783	267/366 (73%)	1516/2342 (64.7)	0.02
Provided commercial sex	261	61/366 (23.4%)	200/2342 (8.5%)	0.02
Used commercial sex	299	51/366 (13.9%)	248/2342 (10.6%)	0.06
Sex with both male and female	324	42/366 (11.5%)	282/2342 (12%)	0.8
Condom dislike	2708	239/366 (65%)	945/2342 (40.1%)	<0.01
Negotiation skills with the partner to use a condom	2708	179/366 (49%)	956/2342(40.1%)	0.05
HIV limited knowledge	2708	134/366 (36.6%)	683/2342 (29.2%)	<0.01
Misperception regarding the risk of HIV/STD transmission	2708	73/366 (20%)	564/2342 (24%)	0.74
Number of sexual encounters in the last six months†	2708	11.6 ± 9.9	8.2 ± 8.4	0.02
Age of first MSM intercourse‡	2708	16.1 ± 3.8	17.7 ± 4.3	0.01

\*Age-adjusted

†Number of contacts

‡Years of age

RUI = risky unprotected anal intercourse; MSM = Men having sex with men

Table 4 Logistic regression of correlates of involvement both in RUAI and substance use

	$\beta$	OR	Lower limit	Upper limit
Residence of Tel-Aviv	0.29	1.37	1.06	1.78
Non-academic education	0.6	1.74	1.37	2.27
Casual contact/s in the last six months	0.94	2.45	1.12	5.43
Provides sex for money	0.5	1.66	1.2	2.3
Lives alone*	-0.3	1.38	1.06	1.8
Has a steady partner, but also involved in sex with casual partners*	-0.34	2.8	2.1	3.69
Condom dislike	-1.01	1.43	1.34	1.59
Negotiation skills	-0.22	2.23	1.89	2.91
HIV limited knowledge	0.39	4.4	3.24	5.6
Age for first sexual intercourse	-0.04	1.01	1	1.03
Number of sexual encounters*	0.07	1.88	1.52	2.27

\*Adjusted to age

RUAI = Risky unprotected anal intercourse

vulnerable for both acquiring and transmitting HIV/STD. Behavioural attributes described by this dual-risk group, which included receptive RUAI, large number of casual partners and involvement in commercial sex should be addressed in future interventions. This dual-risk group reported that they preferred venues such as gay-identified clubs and bars and gay-oriented internet sites to meet their sexual partners.<sup>19</sup> Therefore, interventions to capture this group should include outreach in those premises and sites, employing strategies promoting condom use, educating (especially the young) proprietors regarding the risk of HIV transmission, and addressing barriers to the use of condoms in gay bars, saunas and sex shops.<sup>20</sup> The perils of drug use in distorting the ability to make healthier choices should also be emphasized to this audience. Coordinated public and governmental efforts should be employed in supporting proprietors of gay-oriented venues and opinion leaders in educating MSM about how HIV and STD are transmitted, and in promoting healthier sex practices in specific segments of the gay community, especially in Tel-Aviv. Specific emphasis should be given to the prevention of substance use and harm reduction.

A growing body of literature implies that individuals who use substances also tend to be involved in risky sexual practices.<sup>21-23</sup> Drug use is strongly related to on-line sex and STD/HIV transmission risk, as 'party and play' is a common nick-name used to describe an electronic personal profile in gay-oriented sites. The internet provides a confidential and convenient platform for partner-seeking and is thus gaining popularity.<sup>24,25</sup> The anonymity of cyberspace may facilitate MSM selectively seeking or offering sex and drugs.

The high compliance in responding to the on-line questionnaire is encouraging. The successful reach of the internet within our target group implies that this electronic medium can be further used as an interactive instrument to deliver tailored health messages and health education from health authorities to the gay community in Israel. Furthermore, internet-based surveys are gaining popularity, offering methodological plurality,<sup>24</sup> and are an efficient and inexpensive mean to obtain a large group of gay men.

This study may be subject to several limitations: first, the study captured a convenience sample, which may not represent the entire gay community in Israel or those who use the internet.

However, as the internet gains popularity as one of the major venues for partner-seeking, we can use the findings as a basis for further studies among gay men. Secondly, minority MSM groups in Israel were not represented, as 96% of participants were Jews and more than 91% were Israeli-born. In addition to the fact that the questionnaire was in Hebrew, limited internet access or inadequate command of English required to operate a computer program could be a barrier to reach the MSM population of immigrants or Arabs in Israel. Thirdly, the study was performed in a cross-sectional fashion, thus a causal inference may be inappropriate. We did, however, specify the timeframe of drug use in relation to sexual behaviour in the questionnaire, and participants were asked to complete data only for the previous six months. Finally, the study is subject to reporting bias, especially with regards to sensitive issues such as sex practices and substance use. Yet, higher reporting of risk behaviour has been found through computerized methods of data collection when compared with other means, such as face-to-face interview.<sup>26</sup> The validity of the responses was increased by repeating a few of the questions throughout the questionnaire and by rotating the fashion of the banner in the line of advertisements published in the internet site. In addition, during the data analysis, we chose only the first completed response from each computer browser registered in our electronic system, and disregarded unattainable or incomplete questionnaires. Moreover, the fact that no financial incentive was offered to participants and the long time required to complete the questionnaire (approximately 20 minutes) may serve as disincentive for repeating the questionnaire or perpetrating fraud.

In conclusion, substance use is widespread among a specific fragment of the MSM community in Israel, and MSM who use substances are involving greater risks in sexual behaviour. Individuals who use substances and are involved in RUAI have unique and more risky behaviour patterns. These findings, along with the increasing reported cases of HIV infections among young MSM in Israel, indicate an urgent need to employ efforts to encourage safer sex behaviours and to minimize substance use in the gay community in Israel. The success of this internet survey may encourage health educators to use this instrument as a prevention strategy.

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