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Sexual Sensation Seeking and Internet Sex-Seeking of Middle Eastern Men Who Have Sex with Men

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Abstract Despite recent evidence of stabilization in many developed nations, new human immunodeficiency virus (HIV) infections remain a public health concern globally. Efforts remain fragile in a number of world regions due to incomplete or inconsistent social policies concerning HIV, criminalization of same-sex encounters, social stigma, and religious doctrine. Middle Eastern men who have sex with men (MSM) remain one of the most hidden and stigmatized of all HIV risk groups. High-risk sexual bridging networks from these men to low prevalence populations (e.g., to spouse to offspring) are emerging HIV transmission pathways throughout the region. This cross-sectional, exploratory study investigated Sexual Sensation Seeking Scale (SSSS) scores to predict numbers of recent MSM sexual activities and to predict any recent unprotected receptive anal intercourse (URAI) activities in 86 Middle Eastern MSM who resided in the Middle East and who used the Internet to sex-seek. In a multivariate hierarchical regression, higher SSSS scores predicted higher numbers of recent MSM sexual activities ($p = .028$) and URAI ($p = .022$). In a logistic regression, higher SSSS scores increased the likelihood of engaging in URAI activities threefold (OR 3.0, 95 % CI 1.15–7.85, $p = .025$). Age and drug/alcohol use during sexual activities served as covariates in the regression models and were not significant in any analyses. Despite numerous hurdles, adopting Internet-based, non-restricted HIV education and prevention public health programs in the Middle East could instrumentally enhance efforts toward reducing the likelihood of new HIV transmissions in MSM and their sexual partners, ultimately contributing to an improved quality of life.

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Introduction

As the global burden of human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS) passes the 30-year milestone, UNAIDS (2010) research illustrates that intervention and prevention efforts have begun to slow and stabilize the spread of HIV (UNAIDS, 2010). A reduction of new instances of HIV transmission is a result of social policy changes and enhanced prevention efforts in many developed countries (UNAIDS, 2010), however both efforts remain fragile within the social context of some developing nations (UNAIDS, 2010). Kilmarx (2009) offered that despite HIV stabilization, regions with disproportionate shares of HIV have inconsistent or incomplete social policies concerning the rights and needs of all citizens. The disproportionate burden of new HIV infections in men who have sex with men (MSM), injection drug users, and male/female sex workers remain areas that are in need of revised policy agendas as well as changes in social, political, and religious attitudes (UNAIDS, 2011).

Sexual activity in the Middle East between men, and outside of legal marriage with men or women, is socially and religiously prohibited (Abu-Raddad et al., 2010; Itaborahy, 2012; Kugle, 2010). Nearly every county within this region prohibits sexual activities between men, declares them illegal, and deploys punishment ranging from lashes to imprisonment; five countries declare the death penalty (Itaborahy, 2012). This strict religious doctrine and criminalization of same-sex and extramarital encounters contributes to our lack of understanding regarding MSM sexual patterns associated with HIV-transmission risk in the region (Abu-Raddad et al., 2010; UNAIDS, 2011).

Sexual identities within the Middle East are complex and described as taking on multiple forms from overt identification as gay, though rare, to complex networks of male sex workers and transgendered persons who are biologically male but assume female social and sexual roles in some Middle Eastern regions (Collumbien et al., 2009; Hawkes et al., 2009; Kugle, 2010; Rajabali, Khan, Warraich, Khanani, & Ali, 2008). Abu-Raddad et al. (2010), Shawky et al. (2009), and UNAIDS (2008) reported limited research evidence from the region indicated that unprotected sex in Middle Eastern MSM is the key factor for the introduction of HIV to low-risk persons through bridging networks, defined as overlapping sexual relationships of a MSM with other casual and/or marital heterosexual partners.

Bridging networks involving these men illustrate an important overlap in behaviors forced by socially acceptable relationships found in marriage within the region. Researchers reported that throughout the Middle East North Africa region an estimated 5–17 % of MSM were married (Egypt MOH, 2006; Hawkes et al., 2009), and a number of MSM reported engaging in heterosexual activities through the sex trade industry (El-Sayyed, Kabbash, & El-Gueniedy, 2008). Abu-Raddad et al. (2010) concluded that although much of the research surrounding sexual activities of these men is reported only through regional conference presentations, unpublished research, and personal communication, there was sufficient evidence to conclude that high-risk sexual behaviors between men are prevalent in the Middle East. Abu-Raddad et al. further added that strong elements of sexual concurrence with multiple sexual partners (male and female), high prevalence of sex work by MSM for economic survival, low condom use, and perceived religious insulation against HIV transmission were known factors contributing to HIV transmission throughout the region.

The personality trait of sensation seeking has significant influence on decision-making in high-risk activities and is directly related to a person's risk appraisal and risk tolerance and the underlying values placed on certain sexual behaviors and other high-risk activities (Pinkerton & Abramson, 1992, 1995). Zuckerman, Bone, Neary, Mangelsdorff, and Brustman (1972) defined a sensation seeker as "a person who needs varied, novel, and complex sensations and experiences to maintain an optimal level of arousal" (p. 308). Zuckerman (1984) further refined this definition to include "the wiliness to take physical, social, legal, and financial risks for the sake of such experience" (p. 27; see also Zuckerman, 2004). The underlying assumption of the sensation seeking model is that individuals who are sensation seekers have arousal levels greater than a non-sensation seeker thus requiring ever-increasing levels of stimulation or novelty in order to maintain interest (Horvath & Zuckerman, 1993; Zuckerman, 1984).

Overall risk taking and altered risk appraisal have been shown to be fundamental correlates of sensation-seeking personalities in areas such as extreme sports, high-risk sexual behaviors, use of alcohol and drugs, daredevil behaviors, and illegal activities. Sensation seekers, more often than non-sensation seekers, engage in activities and behaviors including sex, which require increasing levels of stimulation and risk taking (Roberti, 2004; Zuckerman et al., 1972). Individual personality traits such as sexual sensation seeking have been found to be associated with high-risk sexual behaviors in some individuals and offers explanations as to why these behaviors continue (Bancroft et al., 2003, 2004; Kalichman & Rompa, 1995; Nguyen et al., 2011).

Logically, high-sensation seekers have a high tolerance for risk and value high-risk activities to include all forms of sexual risk taking (Horvath & Zuckerman, 1993). Dudley, Rostosky, Korfhage, and Zimmerman (2004), Grosskopf, Harris, Wallace, and Nanin (2011), Kalichman and Rompa (1995), Kalichman, Heckman, and Kelly (1996), Nguyen et al. (2012), and Zuckerman and Myers (1983) found that sexual risk appraisal in males with higher sensation seeking scores significantly correlated with risky sexual behaviors, particularly URAI. In early research sexual-sensation seeking was identified as constituting an "important predictor of HIV risk and of resistance to change high-risk sexual behavior" (Kalichman et al., 1994, p. 387). Through time, research evidence continues to support this hypothesis.

Most Middle Eastern countries lack traditional (Western) social gathering places for MSM and prohibit them by law, cultural norms, and religious doctrine (Abu-Raddad et al., 2010). In order to approach the population of interest for this research an alternate venue needed to be explored. The Internet has been shown to serve a function in social experiences by shaping sexual communities and facilitating sexual networking particularly in hidden subgroups such as MSM (McKenna, Green, & Smith, 2001; Ross, 2005; Ross, Rosser, McCurdy, & Feldman, 2007). Ross (2005) stated that the Internet presents opportunities and shapes sexual culture and Cooper, Scherer, Boies and Gordon (2000) described the Internet as an ideal sexual networking vehicle principally based on the three A's: access, affordability, and anonymity. Bull, McFarlane, and Reitmeijer (2001) and Kim, Kent, McFarland, and Klausner (2001) stated that MSM are one of the largest of the Internet communities and these men are more likely to engage in sexual activities with partners met online as compared to heterosexual men and women.

As a sexual network meeting place in regions outside the Middle East, the Internet is known to be associated with higher frequencies of MSM partners and more high-risk sexual activities with MSM partners met online (Benotsch, Kalichman, & Cage, 2002; Bolding, Davis, Hart, Sherr, & Elford, 2005; Garofalo, Herrick, Mustanski, & Donenberg, 2007; Hirshfield, Remien, Humberston, Walavalkar, & Chiasson, 2004). The research findings of a number of studies examining differences in MSM who met sexual partners online versus offline meeting indicated that increased high-risk sexual behaviors

are associated with online meeting (Kim et al., 2001; Liau, Millet, & Marks, 2006; McFarlane, Bull, & Reitmeijer, 2000; Taylor et al., 2004; Tikkanen & Ross, 2003). Benotsch et al. (2002) found Internet use for sex-seeking more likely to be associated with increased frequencies of unprotected anal and vaginal intercourse. Tikkanen and Ross stated that men who met other men online often sexually identified as non-gay and reported sexual concurrence with women.

Political, religious, and social restrictions of adult-oriented Internet sites in the Middle East have resulted in no access to sexually oriented websites including those offering sexual health information, with rare exception. Governments impose access restrictions through web portal blocking of material considered culturally inappropriate (Shen & Shakir, 2009; Zittrain & Palfrey, 2005). Despite this web portal blocking, MSM residing in the region access commercial sexual networking websites to find sexual partners by using methods to bypass website filters and through the use of virtual private networks (VPN). While the Internet provides an alternative meeting place for men living in the Middle East who are interested in meeting other men for sexual activities, these clandestine efforts are considered illegal by most Middle Eastern governments. Internet access to these sexual networking sites by any means is illegal and places these MSM at heightened risk of apprehension and public disclosure of their sexual interests (Zittrain & Palfrey, 2005). The risk taking approach of these men in the region illustrates parallel behaviors of individuals who have high sensation-seeking personalities and willingly place themselves at risk physically and socially in order to achieve satisfaction through heightened arousal (Zuckerman et al., 1972; Horvath & Zuckerman, 1993; Zuckerman, 1984). To date, no published research has exclusively examined the relationship of sexual sensation seeking and high-risk sexual activities of Middle Eastern MSM who use the Internet to sex-seek within the region.

Study Objectives

In order to further examine the personality trait of sexual sensation seeking and sexual activities in these men a cross-sectional, exploratory, Internet-based study was conducted. The Sexual Risk Behavior of Internet-Using Middle Eastern MSM instrument was created, pilot tested, and the final version was used in the IRB-approved research protocol (Walden University IRB June 2011).

The instrument incorporated the Kalichman and Rompa (1995) Sexual Sensation Seeking Scale (SSSS) as the predictor variable, self-reported recent frequencies of eight common MSM sexual activities as the outcome variables, sexual activity risk-identifying/risk-ranking exercises, along with demographic characteristics extracted from the reviewed literature. Specifically, the research investigated relationships between SSSS scores and the number of self-reported sexual activities in the past 3 months among Middle Eastern MSM who use the Internet to sek-seek and who reside in the Middle East. Vittinghoff et al. (1999) found that URAI is the highest risk sexual behavior in MSM for the transmission of HIV; therefore, URAI was also investigated separately. Younger age (Valleroy et al., 2000; Wilson, Cook, McGaskey, Rowe, & Dennis, 2008) and use of drugs and alcohol (Kalichman, Cain, Zweben, & Swain, 2003; Valleroy et al., 2000) were found to be associated with high-risk sexual activities, particularly URAI, in other world regions and they served as covariates in this study.

Hypotheses

Given the body of literature associating higher SSSS scores and Internet use for sex-seeking with increased frequency of high-risk sexual behaviors in MSM, it was hypothesized that: (1) higher SSSS scores among Middle Eastern MSM who use the Internet to seek sexual partners and who reside in the Middle East would be associated with higher number of self-reported sexual activities in the past 3 months, after controlling for age and drug/alcohol use; (2) higher SSSS scores among Middle Eastern MSM who use the Internet to seek sexual partners and who reside in the Middle East would be associated with higher number of self-reported URAI activities in the past 3 months, after controlling for age and drug/alcohol use.

Methods

Participants

Participants ($n = 86$) for this cross-sectional study were drawn from a population of user profiles located on a globally available social-sexual networking site. Due to the prohibitive nature of the website in most Middle Eastern countries, a VPN access feature was required to access the website. The website offered search filter criteria allowing the geographic isolation of user profiles from the Middle East, as defined by the webmaster, and not necessarily associated along political, territorial, or cultural definitions of the region. Eligible participant inclusion criteria included personal profiles that identified a location in one of 16 countries filtered by the website and categorized as the Middle East, Middle Eastern ethnicity, male, and at least 18 years old based on primary profile filtering. Secondary filters for preferred sex role, body type, body hair, etc., were set to "All" for maximum profile selection. At least English listed in the *mylanguages* section of the profile was required for inclusion but examined in a subsequent process. Profiles not meeting the primary filtering criteria were excluded. An estimated 40,000 online profiles meeting inclusion criteria were available each day during the sampling time

period. All profile criteria responses were user-created through self-reported answers and did not undergo further validation.

Over a 2-month period, June 24 to August 23, 2011, a total of 2,565 survey invitations were sent to eligible website users. Using a purposeful sampling methodology, profiles were selected for review in each of the 9 time frames sorted by the website: *on line now*, visited in the last 24 h, visited in the last 1 day, 2, 3, 4, 5, 6 days, last visited 1 week. Thirty-six member profiles were displayed in each page of the sorting timeframe. Positioning of a member profile is dynamic based on individual activity in the website; therefore, a user profile found in a day 3 sorting on any given day might later be found *on line now*, or any other of the time frames. Beginning with the first profile on the sequential time frame pages, the top profile was opened and verified for inclusion criteria. If at least English was listed in the *mylanguages* section, a standardized invitation to participate in the study was placed in the member's message box. Selected profiles that did not include at least English in the mylanguages section were skipped and the next available page profile was reviewed for potential inclusion.

The invitation included a copy and paste browser link to the survey instrument hosted on SurveyMonkey. Using a copy and paste method exported the potential participant from the website thereby providing anonymity by disconnecting their membership name and profile from their submitted data. Furthermore, SurveyMonkey was set to not capture incoming Internet Protocol (IP) addresses. Profile member names of eligible and selected participants were recorded to avoid re-invitation in subsequent distributions. Re-invitation, typically useful in survey research, potentially violated the terms and conditions of membership, thus potentially blocked access to the participant pool.

In the initial stages of the research, up to 450 invitations (50 per time frame) were being distributed every 3 days. This approach resulted in a number of instances of triggering website spam filtering due to the identical size of the invitation placed in message boxes as well as the VPN incoming IP address based in the United States. Subsequent changes in the invitation routine were made. Spam filtering ceased when distributing 90 invitations per day (45 per session, 2 sessions per day), and using a newly available VPN access point located within the Middle Eastern region.

Measures

The research instrument created for this research included demographic, predictor, and outcome variables consistently illustrated in the reviewed literature as important research variables in understanding high-risk sexual behaviors of MSM (Table 1). Participants were asked to record their age in years and then select one answer that best reflected their response in each of the following seven descriptive questions: Middle Eastern country of residence, highest level of education, website use, website access frequency, sexual behavior categorization, HIV testing history, and use of drugs or alcohol during sexual activities.

Middle Eastern residency was recorded by the participant in their membership profile and is inclusive of countries in the Gulf Cooperate Council (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates) and other adjacent counties (Iran, Iraq, Israel, Jordan, Lebanon, Palestinian Authority, Syria, Yemen, Egypt, Afghanistan) as defined by the website. This self-reported location provided the basis for the profile filtering and selection specific to the Middle Eastern region. Within the instrument participants were asked to select their specific country of residency or opt not to say.

Education levels were divided into nine options ranging from "have never attended school" through "I have an advanced degree beyond basic college/trade school level (ex: Masters, MBBS, JD, MD, PhD)." Website use was based on the participant's intention for membership (social networking, sexual networking, social and sexual networking, or other use).

Website access frequency was divided into six discrete time periods ranging from "2 or more times per day" to "less often than weekly" and the time periods aligned with the websites' on-line activity sort feature. Sexual behavior description listed seven categories ranging from "I have sex with men only" through "I have sex with women only." Participants reporting sex with women but with curiosity or fantasies with men ($n = 3$) were retained in the study whereas individuals reporting sex exclusively with women were. Human immunodeficiency

Table 1 Research variables by category

Descriptive	IV	DV	Covariates
Middle Eastern ethnicity/heritage	Sexual Sensation Seeking Scale score	Sexual activities in past 3 months (recent activities)	Age in years
Middle East residency location		URAI in past 3 months (recent activities)	Use of drugs/alcohol associated with sexual activities
Education level			
Website purpose			
Frequency of website use			
Sexual behavior descriptor			
HIV test history			

virus (HIV) testing history was asked, "Have you ever taken and HIV test?" with response options of "yes, no, unsure."

Finally, participants were asked if they had sexual activities while using drugs or alcohol with men they met on the Internet. Responses were categorized as "no, yes, or I have not had sex with men I met on the Internet." Participants responding that they had not had sex with men met on the Internet were removed from the final sample.

The primary predictor variable was the Sexual Sensation Seeking Scale (SSSS) (Kalichman & Rompa, 1995). The SSSS instrument contains nine declarative statements used to measure the personality trait of sexual sensation seeking and is a contemporized version of the Zuckerman Form V Sensation Seeking Scale (Zuckerman, 1971). Responses to the nine declarative statements are categorized as: (1) Not at all like me; (2) Slightly like me; (3) Mainly like me; (4) Very much like me. The response scores are tallied and divided by the number of scale questions with resulting numeric values ranging from 1 (low sexual sensation seeking) to 4 (high sexual sensation seeking). Kalichman et al. (1994) and Kalichman and Rompa (1995) concluded through initial contemporizing and subsequent validation and reliability testing of the SSSS instrument that the personality trait of sexual sensation seeking provided compelling and sufficient evidence to explain significant variances in high-risk sexual activities in persons with high scale scores compared to persons with average or low scale scores. As such, individuals with higher SSSS scores, those approaching the value of 4, would likely report or exhibit increased frequency of high-risk sexual activities, including multiple partners, and URAI (Kalichman et al., 1994; Kalichman & Rompa, 1995). The SSSS scores had acceptable internal consistency for the current sample (Cronbach's $\alpha = .70$).

The primary outcome variables were defined as the number of sexual activities in the past 3 months from a list of eight common MSM sexual activities: Giving oral sex where your partner "cums" in your mouth; Rimming (oral–anal contact); Anal sex without a condom (top, insertive partner); Anal sex with a condom (top, insertive partner); Anal sex without a condom (bottom, receptive partner where you partner "cums" in your ass); Fisting; Receiving oral sex; Anal sex with a condom (bottom, receptive partner). Participants were asked to provide a numeric value of the number of times they engaged each of these behavior in the past 3 months. Blank answers were considered as non-responsive and removed from data analyses. Zero answers were categorized as responsive answers and remained in the data analyses. Participants who selected "I have not had sex with men I met on the Internet" were removed from the final sample.

Given the high-risk nature of URAI and HIV transmission in MSM (Vittinghoff et al., 1999), URAI activities were extracted from the summed total of the eight activities and underwent individual analysis as a second outcome variable. A single URAI episode is conducive for HIV transmission risk (Baggaley, White, & Boily, 2010); therefore, the frequency counts of URAI were also recoded and categorized as "none" (no recent URAI activities) and "some" (yes recent URAI activities) for logistic regression.

Statistical Analysis

Using PASW v.18 (2010), descriptive characteristics underwent univariate analyses and were reported using number, percentages, and, where applicable to the data level, means and SDs (Table 2). Multiple linear regression was used to assess the relationships between the SSSS scores (predictor variable; interval level) and the predictor covariates of age (ratio level) and drug/alcohol use (nominal level) and the summed frequencies of eight common MSM sexual activities (ratio level), including URAI. A hierarchical methodology was used where the covariates were entered into the regression model first (Model 1), covariates were combined with the primary predictor variable second (Model 2), and any significant changes in the proportion of variance (R^2) of the predictor variables were retained for final analysis (Model 3). The covariates did not significantly contribute in either hypothesis test to the proportion of variance change in Model 2 and were subsequently dropped from Model 3 in the final analysis. Following this same hierarchical approach, URAI (re-coded "none/some"; nominal level) was regressed on the SSSS predictor variable using logistic regression.

Cohen's (1992) methodology was used to derive a sufficient sample size for multiple and multiple partial correlation analysis (multiple linear regression). Conforming to the reviewed social/behavioral literature, which served as the basis for the directional hypotheses, a minimum sample size of 76 was found to be necessary to meet an alpha of .05, effect size of $f^2 = .15$, and power of .80 with 3 predictor variables (k) in the statistical analyses. Of the 2,565 invitations distributed to eligible participants, a response rate of 8.6 % ($n = 220$) was obtained. Incomplete data in any of the predictor variables was classified as ineligible and were removed from analyses. A final set of usable data was derived from 3.4 % ($n = 86$) of participants and using G*Power (Faul, Erdfelder, Buchner, & Lang, 2009), a post hoc power of .85 was computed. Where possible, analyses were conducted between the retained and excluded participant's descriptive data. With the exception of purpose for website usages, no significant differences in the descriptive characteristics between the retained and excluded participant groups were found.

Results

Descriptive Statistics

Descriptive statistics for the sample participants are shown in Table 2. The participants were distributed throughout the

Table 2 Demographic characteristics of the participants

	Number	Percentage
Middle East residency		
Bahrain	2	2.3 %
Iran	15	17.4 %
Iraq	2	2.3 %
Jordan	7	8.1 %
Kuwait	5	5.8 %
Lebanon	11	12.8 %
Oman	2	2.3 %
Palestinian Authority	5	5.8 %
Saudi Arabia	3	3.5 %
Syria	14	16.3 %
United Arab Emirates	10	11.6 %
Yemen	1	1.2 %
Egypt	7	8.1 %
Afghanistan	0	0 %
Prefer not to say	2	2.3 %
Education level		
Have never attended school	0	0.0 %
Primary school of grade school	0	0.0 %
Attended secondary school but did not graduate	2	2.3 %
Secondary school graduate	1	1.2 %
Attended trade school but did not graduate	0	0 %
Attended trade school and graduated	0	0 %
Attended college/university but did not graduate	21	24.4 %
Attended college/university and graduated	39	45.3 %
I have an advanced degree beyond basic college/trade school level (ex: Masters, MBBS, JD, MD, PhD)	23	26.7 %
Website usage		
Social networking	12	14 %
Sexual networking (finding a sex partner)	19	22.1 %
Social and sexual networking	51	59.3 %
Other use	3	3.5 %
Missing response	1	1.2 %
Website frequency		
2 or more times per day	15	17.4 %
1 time per day	27	31.4 %
Every 2–3 days	19	22.1 %
Every 4–6 days	5	5.8 %
Weekly	13	15.1 %
Less than weekly	7	8.1 %
Sexual behaviors		
I have sex only with men	47	54.7 %
I have sex only with men but have fantasized or am curious about sex with women	19	22.1 %
I have sex mostly with men and sometimes with women	6	7 %
I have sex with men and women equally	4	4.7 %
I have sex mostly with women and sometimes with men	6	7 %
I have sex only with women but have fantasized or am curious about sex with men	3	3.5 %
Missing response	1	1.2 %
HIV testing experience (have you ever taken an HIV test)		
Yes	46	53.5 %
No	36	41.9 %
I am unsure if I have ever taken an HIV test	3	3.5 %
Missing response	1	1.1 %

Middle East with peak participation from Iran ($n = 15$; 17.4 %) and two opted for "Prefer not to say." Nearly all participants had attended college/university (96.4 %), with 72 % graduating. Of those who graduated from college/university, 26.7 % reported advanced educational degrees. Over half of the participants (59.3 %) reported accessing the website for both social and sexual networking purposes, 31.4 % reported accessing the website at least daily and over 90 % accessed the website at least once per week. Participants predominantly reported sex exclusively with men (54.7 %) or with men only and curiosity or fantasy about sex with women (22.1 %). Bisexual behaviors were reported in 18.7 % of the participants and 3.5 % reported sex with women only but with sexual curiosity or fantasies about sex with men. Finally, over half (53.5 %) reported "yes" to have taken an HIV test in the past and 41.9 % reported "no," with 3.5 % "unsure" if they had taken an HIV test or not.

Covariate, Predictor, and Outcome Variables

Age on their last birthday and drug/alcohol use during sexual activities with men met on the Internet served as covariates in the regression analyses. The mean age of the sample group was 27.6 years (SD = 6.64; range 18–50). Sixty-three (73.3 %) of the participants responded "no" and 23 (26.7 %) responded "yes" to the use of drugs/alcohol with sexual activities with men met on the Internet (Table 3).

Sexual Sensation Seeking Scale scores served as the primary predictor variable. The mean SSSS score of the participants was 2.32 (SD = 0.52) (Table 3) descriptively ranging between "Slightly like me" to "Mainly like me."

The summed total of all 8 sexual activities from the 86 participants in the past 3 months was 1,468 with a mean of 17.1 activities per participant (SD = 18.09; range, 0–3). These outcome variable data were at the upper limits of acceptable skewness (1.69) and kurtosis (2.69) and were transformed using natural logarithmic transformation (skewness = −.25; kurtosis = −.65) in order to increase the likelihood that the

Table 3 Covariate/predictor/outcome variables of sample population

	N	Percentage	M	SD	Range
Covariates					
Age	86	100 %	27.6	6.64	32
Use of drugs/alcohol associated with sexual activities					
No	63	73.3 %			
Yes	23	26.7 %			
Predictor variable					
Sexual Sensation Seeking Scale (SSSS) scores	86	100 %	2.32	0.52	
Outcome variables					
Frequency of recent common MSM sexual activities					
Sexual activities reported	86	100 %			
Summed activities, total	1,468		17.1	18.09	83
No sex with men met on the Internet	130				
Frequency of recent URAI activities					
URAI total	100				
URAI—none	56	65.1 %			
URAI—some	30	34.9 %	1.2	3.19	25
Post hoc Analysis SSSS and URAI					
None	56		2.23	0.46	
Some	30		2.49	0.56	

residuals would exhibit normal distribution. Some participants also reported an additional total of 130 sexual activities with men or women not met on the Internet. These same participants also reported sexual activities with men met on the Internet; the 130 off-line sexual activities were excluded from the analyses.

Unprotected receptive anal intercourse activities were extracted from the summed total of recent sexual activities. These outcome variable data exceeded the acceptable limits of skewness (5.52) and kurtosis (37.59) and were transformed using natural logarithmic transformation (skewness = 2.33; kurtosis = 6.34) in order to increase the likelihood that the residuals would approach normal distribution. Adopting a methodological approach that a single URAI behavior placed a participant at risk, these data were dichotomized for final analyses. A total of 56 participants (65.1 %) reported no URAI activities and were recoded as "none" and 30 participants (34.9 %) reported 1 or more URAI activities and were recoded as "some." The 30 participants recoded as "some" reported a total of 100 recent URAI activities ($M = 1.2$, SD = 3.19; range, 1–25) illustrating that a minority of the participants are practicing the high-risk behavior of URAI; some with significantly more URAI frequency than others.

Multiple Regression

In order to examine the predictor variable and covariates for associations prior to regression analysis, correlation coefficients were computed (Table 4). Age and drug/alcohol use during sexual activities were not significantly correlated with each other, $r(84) = .06$; however, each independently demonstrated significant correlations with SSSS scores, age: $r(84) = .24$, $p < .05$, drug/alcohol use: $r(84) = .35$, $p < .01$. Drug/alcohol use: $r(84) = .20$, $p < .05$, and SSSS scores, $r(84) = .25$, $p < .01$, were significantly correlated with the outcome variable of summed total of MSM sexual activities whereas age showed no significant correlation, $r(84) = .01$. The summed total of URAI activities was significantly correlated with drug/alcohol use, $r(84) = .18$, $p < .05$, SSSS scores, $r(84) = .21$, $p < .05$, and summed total of MSM sexual activities, $r(84) = .42$, $p < .01$.

Table 4 Correlation coefficients of the study variables

Variables	1	2	3	4	5
1. Age	1				
2. Drug/alcohol use	.06	1			
3. SSSS	.24*	.35**	1		
4. Summed total of MSM sexual activities	.01	.20*	.25**	1	
5. Summed total of URAI	.02	.18*	.21*	.42**	1

* $p < .05$ (1-tailed); ** $p < .01$ (1-tailed)

Using evidence from the correlation matrix, the hierarchical multiple regression models were constructed to test Hypothesis 1. The control variables age (in years on last birthday) and drug and alcohol use during sexual activities (*no* = 0, *yes* = 1) were entered into the prediction equation as Model 1. Neither covariate significantly predicted the proportion of variance in the dependent variable, $R^2\Delta = .055$, $F\Delta = 2.39$, $p = .097$ (Table 5). Given the independent significant correlations between the covariates and the primary predictor variable SSSS scores, all were combined to form Model 2. Model 2 illustrated that SSSS scores, when added to the covariates, did not result in a significant change in the proportion of variance in the outcome variable, $R^2\Delta = .030$, $F\Delta = 2.70$, $p = .104$. Huizingh (2007) argued that when assessing one-tailed significance levels in correlation and regression analysis, the displayed significance level (p) is to be divided in two. Applying this argument, there was evidence of $F\Delta$ significance when evaluating for one-tailed hypothesis testing ($p = .052$). Review of the ANOVA and multiple regression two-tailed coefficients demonstrated that age and drug/alcohol use did not significantly contribute to the proportion of variance in the models nor were they significant when adjusted for one-tailed testing. The covariates were dropped in the final model.

Model 3 illustrated that a significant change in the proportion of variance in the dependent variable is demonstrated, $R^2\Delta = .056$, $F\Delta = 5.03$, $p = .028$, when the SSSS score was the only predictor variable in the model. The SSSS score predicted 5.6 % of the variance in summed frequencies of MSM sexual activities, $F(1, 85) = 5.03$, $p = .028$ (Table 5).

Table 5 Hierarchical multiple regression for summed sexual activities regressed on SSSS scores and covariate predictors

Model	R	R^2	Adjusted R^2	SE of the estimate	Change statistics				
					R^2 change	F change	$df1$	$df2$	Sig. F change
1	.234[a]	.055	.032	.99093	.055	2.395	2	83	.097
2	.291[b]	.085	.051	.98092	.030	2.704	1	82	.104
3	.238[c]	.056	.045	.98402	.056	5.028	1	84	.028*

Outcome variable: Summed total of the 8 common MSM sexual activities (natural log transformed)

* $p < .05$

[a] Model 1 predictors = (constant), age, drug and/or alcohol use during sexual activities

[b] Model 2 predictors = (constant), age, drug and/or alcohol use during sexual activities, SSSS scores

[c] Model 3 predictors = (constant), SSSS scores

Table 6 Hierarchical multiple regression for URAI activities regressed on SSSS scores and covariate predictors

Model	R	R^2	Adjusted R^2	SE of the estimate	Change statistics				
					R^2 change	F change	$df1$	$df2$	Sig. F change
1	.203[a]	.041	.018	.48758	.041	1.780	2	83	.175
2	.274[b]	.075	.041	.48176	.034	3.019	1	82	.086
3	.247[c]	.061	.050	.47963	.061	5.454	1	84	.022*

Outcome variable: Summed URAI activities (natural log transformed)

* $p < .05$

[a] Model 1 predictors = (constant), age, drug and/or alcohol use during sexual activities

[b] Model 2 predictors = (constant), age, drug and/or alcohol use during sexual activities, SSSS scores

[c] Model 3 predictors = (constant), SSSS scores

Every 1-unit increase in SSSS scores yielded a .47-unit increase in the predicted summed frequencies of MSM sexual activities in the past 3 months, $\beta = .47$, $p = .028$. The significance of the final model, after removing the non-significant covariates, demonstrated a positive relationship between SSSS scores and the number of self-reported sexual activities in the past 3 months supporting Hypothesis 1.

Applying this same methodology using the transformed URAI data, Hypothesis 2 was tested. For this question, the number of self-reported URAI activities from the summed total of all MSM activities was extracted. Similar to the findings in the first hypothesis test, the covariates did not significantly contribute to the proportion of variance in the dependent variable in Model 1, $R^2\Delta = .041$, $F\Delta = 1.78$; however, when assessing for one-tailed outputs, Model 2 ($R^2\Delta = .034$, $F\Delta = 3.02$, $p = .086$) (Table 6) demonstrated potential significance, $p = .043$. Review of the ANOVA and multiple regression two-tailed coefficients demonstrated that age and drug/alcohol use did not significantly contribute to the proportion of variance in the models nor were they significant when adjusted for one-tailed testing and they were dropped in the final model.

Model 3 illustrated that a significant change in the proportion of variance in the outcome variable is demonstrated, $R^2\Delta = .061$, $F\Delta = 5.45$, $p = .022$, when the SSSS score was the only predictor variable in the model. Sexual Sensation Seeking Scale scores predicted 6.1 % of the variance in URAI activities, $F(1, 85) = 5.54$, $p = .022$ (Table 6). Every 1-unit increase in SSSS score yielded a .23-unit increase in the predicted URAI activities in the past 3 months, $\beta = .23$, $p = .022$. The significance of the final model, after removing the non-significant covariates, demonstrated a positive relationship between the SSSS score and the proportion of URAI activities in the past 3 months, supporting Hypothesis 2.

Using the methodological assumption that a single URAI activity introduces risk for contracting HIV, the summed frequencies of URAI were dichotomized into none/some and analyzed using logistic regression. As with the hierarchical models, the covariates were not significant in the final logistic regression model: age (OR = 1.00, 95 % CI .94–1.08); drug/alcohol use (OR = −.67, 95 % CI .23–1.95). When computing the OR with SSSS scores in the model alone, a threefold increase in the likelihood of participating in URAI activities was demonstrated with increasing SSSS scores, OR = 3.0, 95 % CI 1.15–7.85, $p = .025$ (Table 7).

Post Hoc Analysis of SSSS Scores and URAI

These regression analyses illustrated evidence of significantly positive relationships between SSSS scores and the number of recently MSM sexual activities combined and URAI separately. To investigate the relationship of higher SSSS scores on

Table 7 Logistic regression for URAI activities regressed on SSSS scores

	b	SE	*p*	OR	95 % CI for OR
Constant	−3.22	1.20	.007	.04	
SSSS scores	1.10	.49	.025	3.00	1.15, 7.84

Outcome variable: Dichotomized URAI activities (none/some)

reported URAI activities further, SSSS scores from participants grouped as "none" ($n = 56$) and "some" ($n = 30$) (Table 3) were analyzed. The mean SSSS scores of participants grouped "none" was 2.23 (SD = .46) and SSSS scores of "some" was 2.49 (SD = .56). Using a one-sample *t* test, the grouped means were compared. The mean SSSS scores of participants grouped as "some" were significantly higher ($p = .015$) than the mean SSSS scores of participants grouped "none."

Discussion

This study investigated the relationships between the predictor variable, SSSS scores, and the number of times in the past 3 months Middle Eastern MSM who reside in the Middle East and use the Internet to sex-seek engaged in one or more of the eight common MSM sexual activities listed on the questionnaire. Unprotected receptive anal intercourse (URAI) is a known high-risk behavior in MSM for the transmission of HIV (Baggaley et al. 2010; Vittinghoff et al., 1999); therefore, it was also independently evaluated.

Consistent with Hypothesis 1, higher SSSS scores were significantly associated with higher summed frequencies of the eight common MSM sexual behaviors in these men in the past 3 months. Previous researchers reported that a higher sexual sensation seeking personality trait, as measured by the SSSS scale (Kalichman & Rompa, 1995), was associated with higher numbers of MSM sexual activities and higher risk activities for HIV transmission to include URAI (Dudley et al., 2004; Grosskopf et al., 2011; Kalichman et al., 1996; McCoul & Haslam, 2001; Nguyen et al., 2011). The research evidence from this study indicated similar findings within this unstudied population of men and adds to the seminal evidence that increased sexual experience frequency in gay men is associated with higher Zuckerman Form V sensation seeking scale scores (Zuckerman & Myers, 1983); the foundation instrument from which the Kalichman and Rompa (1995) scale was derived.

Consistent with Hypothesis 2, higher SSSS scores were significantly associated with higher number of URAI activities overall and higher SSSS scores increased the likelihood of engaging in URAI in the past 3 months. Post-hoc analyses of "some" reported URAI activities illustrated the highest SSSS score means of any participants occurred in these men; a significant difference from SSSS scores in men whose URAI activities recoded as "none." Within the sample group only a minority (34.9 %) contributed to this highest risk behavior for HIV transmission.

Age and drug/alcohol use during sexual activities of MSM in other settings were identified as possible predictors for increased frequency and engagement in high-risk sexual activities, thus their inclusion in this unstudied population. When examining the contribution of the covariates in this research, age and drug/alcohol during sexual activities were not significantly correlated with each other ($r = .06$; $p > .05$) but each had significant correlation with other study variables independently. When grouped as covariates in the regression models for both hypothesis tests neither covariate significantly predicted a change in the proportion of variance in the outcome variable and were dropped in the final analyses.

Valleroy et al. (2000) and Wilson et al. (2008) found that younger age was a significant predictor of the number of sexual partners in MSM and was specifically linked to high-risk sexual activities. This research found that age, while positively correlated with SSSS scores ($r = .24$; $p = .05$; Table 4), was not significantly correlated with the summed total of the MSM sexual activities ($r = .013$; $p > .05$; Table 4). These findings were consistent with Dudley et al. (2004) and Desrichard and Denarie (2005) who found significant associations between SSSS scores, URAI, and total number of sexual partners but no significant associations with the age of participants and these behaviors. The mean age of participants in this study was 27.6 (SD 6.64). The older age of these men might be indicative of later sexual debut (Dudley et al., 2004; Desrichard & Denarie, 2005) for any sexual activities in this setting or later sexual debut of MSM-specific sexual activities given the cultural, religious, and legal context of these behaviors in the Middle East (Abu-Raddad et al., 2010; Mumtaz et al., 2011). These social constructs of the region combined with the legal intolerance of MSM sexual activities may play a role in delayed sexual unions of MSM until they are older and illustrate opportunities for further research.

Previous research also found significant associations between drug and alcohol use during sexual activities (Valleroy et al., 2000; Dudley et al., 2004) and high-risk sexual behaviors. Kalichman et al. (1996) and Newcomb, Clerkin, and Mustanski (2011) found significant associations between SSSS scores, any alcohol and recreational drug use, drug use before any sexual activity, and high-risk, unprotected sex in MSM. A minority, twenty-three participants (26.7 %), reported use of drugs and alcohol during sexual activities with men met on the Internet (Table 3). Given the illicit stance on alcohol and drug use in most areas of the Middle East and the religious implications of both substances according to Islam, the number of men reporting use of either substance was higher than expected. Some participants reported access to both drugs and alcohol and their concomitant use with MSM sexual activities. Both substances have been shown to be conducive for participation in high-risk sexual behaviors in other settings (Dudley et al., 2004; Kalichman et al.,

2003; Valleroy et al., 2000) and further investigation into what role both substances play in MSM sexual activities throughout the region is warranted.

Finally, Abu-Raddad et al. (2010), Shawky et al. (2009), and research compiled by UNAIDS (2008) described bridging behaviors between MSM and lower risk partners, inclusive of heterosexual marital and non-marital partners as a significant area of concern for HIV transmission patterns throughout the Middle East. In this study, subjects were asked to describe the sexual behavior pattern that most likely represented their sexual preferences. Nearly 77 % ($n = 66$) reported sexual activity exclusively with men. Bisexual activities were selected by 18.7 % of the participants ($n = 16$), and 3.5 % ($n = 3$) described exclusive heterosexual activities but with fantasies or curiosity about male sexual encounters. There was one non-response (1.1 %). One participant who reported exclusive heterosexual activities but with fantasies or curiosity about male sexual encounters reported MSM sexual activities, as did the participant who did not provide a descriptive response. The potential for bridging behaviors conducive to HIV transmission therefore is evident in these men. Creation and publishing of an online profile in this male-to-male, social-sexual networking site illustrated willful intent and socially desirable responses could not be ruled out; therefore, these final two participants were retained for analyses.

Limitation and Future Directions

The exploratory nature of this study within the Middle East in a population of MSM previously unreported in the literature presented a number of methodological challenges and considerations. The gradient of social and political stability in the region is varied placing individuals along a social and economical continuum of poverty through extreme wealth and without a common denominator to describe socioeconomic standing. The illegality of both MSM sexual activities and accessing of adult-orientated websites within the region required a methodological balance between inclusion of relevant demographic and study variables in order to obtain baseline information versus in depth content response variables found in similar research in other world regions. For example, in other research settings asking if the participant had taken an HIV test typically is followed with reporting results of the same. The depth of this type of question may have resulted in the participant leaving the study for fear of personal discovery if they believed the government was somehow conducting the research or could trace submitted results to their computer access point. The following study limitations have been identified with these methodological considerations in mind.

The lack of traditional social meeting places for these men required investigation of alternate research platforms, such as the Internet, in which to locate potential participants. While the Internet provided a suitable and safe location in which to conduct the study, potential participants who did not have access to the Internet due to lack of personal resources or lack of Internet infrastructure within their communities most likely were not represented, thusly the primary study limitation. Potential participants who did have Internet access may not have had knowledge of, or engagement in the form of an online profile, in the social-sexual networking site from which the sample was drawn. For those participating, no control was provided over the setting in which they completed the survey instrument. These elements, when combined with the purposeful sampling strategy within the website, reduced representation and limited the generalizability of study conclusions to the MSM population throughout the region.

A second limitation is survey instrument language. Within the member's profile inclusion of "English" in the *mylanguages* section was used as eligibility criteria. No attempt was made to validate participant English comprehension. Of the 220 participants who responded to the study invitation, accessed, and provided at least one data point in the instrument, 134 participants (61 %) did not complete the survey to the extent their data were usable. Examination of the raw data found that nearly 100 % of the participants who did not provide usable data submitted the survey after their demographic responses and before completion of the SSSS activity and recording of their recent sexual activities. Invitation to participate, informed consent, instructions, and the question/response format of the instrument were available in English only. The difference in education levels between those who exited and those who completed the survey was not significant. Participant withdrawal or failure to complete the instrument could possibly be associated with a lack of English reading comprehension to a degree necessary to read and respond despite reported education levels as not all college and graduate education in the region is conducted in English. Given the departure point within the instrument of most, a reasonable assumption regarding the intrusiveness of the questioning or personal fear of discovery may have also reduced full participation. Future research using an Arabic language version of the instrument is necessary.

A third limitation was related to the response inquiry related to recent summed frequencies of MSM sexual activities. While the study objectives and the instrument were designed to examine MSM who met other partners in an online environment, there was no content analysis of MSM sexual activities in partners met off-line or with concurrent sexual partners of either gender; thus potentially underrepresenting the proportion of variance accounted for in the outcome variable had those items been separately included in the instrument. Drawing on recency theory constructs concerning event recall, this research did not take into consideration lifetime recall of MSM sexual activities, which may differ in quantity and associated risk from those encounters in the past 3 months.

A fourth limitation was survey response bias given the self-reported and anonymous response format. No attempt was made to determine the veracity of the responses and participants may have under reported their true frequencies of recent sexual activities to values perceived to be more socially acceptable or they may have responded with "locker room bravado" by fabricating or overinflating recent sexual activity responses. Profile names were recorded to avoid duplicate invitations and profiles containing identical pictures but different profile names were excluded to minimize duplicate participation.

Social stigma and religiosity have been identified from the reviewed literature as two key variables for future research in this population. Their absence from inclusion in this exploratory study was due in part to the complexity of both concepts within the Middle East. In order to measure and draw appropriate conclusions from a participant's religiosity investigation into the specifics and sub-categories of the religion would be required. For example, if segregating participants as Muslims from other practiced religions in the region, investigation into sectarian beliefs (Sunni, Shi'a, etc.) and individual followings of Islamic schools of jurisprudence would be necessary (Kugle, 2010). Social stigma and cultural acceptance are derivatives within the context of religion in the region (Abu-Raddad et al., 2010; Kugle, 2010; Shawky et al. 2009).

Briefly, in other geographic regions Chng and Geliga-Vargas (2000) found that one's ethnic identity and cultural affiliation was of primary importance when determining attitudes and beliefs associated with health and health practices particularly when associated with homosexual behaviors. Furthermore, social or cultural isolation, when coupled with physical isolation, introduces limited mainstream access to social networking (Chng & Geliga-Vargas, 2000). Often MSM suffer social isolation with limited access to social networks where HIV intervention education may be found (Chng & Geliga-Vargas, 2000). Elements of internalized homophobia or personal shame regarding same-sex behaviors may also drive MSM sexual behaviors underground (Chng & Geliga-Vargas, 2000). Williams, Bowen, and Horvath (2005) offered that fear of being ostracized, difficulties in accessing qualified healthcare, and limited access to health education for MSM in isolated living situations were identified as contributing factors to increased social stigma. Preston et al. (2004) and Preston, D'Augelli, Kassab, and Starks (2007) found significant associations between self-esteem, frequency of sexual partners, and URAI in geographically isolated MSM. The combination of these factors contributed to lack of awareness stemming from lack of accessible social networking where modeling of safer sex behaviors can occur (Preston et al., 2004, 2007; Williams et al., 2005).

Abu-Raddad et al. (2010), Shawky et al. (2009), and UNAIDS (2011) described Middle Eastern MSM residing in the region as the most hidden and stigmatized of all HIV risk groups in the world. This research has demonstrated that MSM sexual activities are occurring with evidence both in frequency and associated risk for HIV transmission between Middle Eastern MSM and potentially lower risk sexual partners. Furthermore, this research has found that exhibiting a higher sexual sensation seeking personality traits is significantly associated with increased frequencies of common MSM sexual activities and high-risk URAI. The presence of a higher sexual sensation seeking personality trait in these Middle Eastern MSM is a significant factor in their decision-making, risk appraisal, and risk tolerance despite the significant cultural, religious, and legal norms throughout the region.

The final study limitation was response size. While the number of participants was sufficient to meet the necessary conditions for statistical analyses, generalizability to the wider online community of MSM sex-seekers in the region and those who sex-seek off line is limited. Deployment of an Arabic-version of the research instrument, adding additional regional sexual networking sites, and conducting the research in the very limited off-line communities would enhance generalizability overall.

Conclusion and Recommendations

This is the first known research to examine the study variables using Middle Eastern MSM residing in the Middle East and who use the Internet to sex-seek. Sexual Sensation Seeking Scale scores predicted 6.4 % of the variance in summed frequencies of MSM sexual activities, 6.2 % of the variance in URAI activities, and a threefold increase in the likelihood of engaging in some URAI versus none as SSSS scores increased. These values, while significant, explain only a small portion of the effect size. The survey instrument was created from variables associated with high-risk sexual activities in MSM found in predominantly Western research literature. Abu-Raddad et al. (2010) and Mumtaz et al. (2011) argued that applying Western definitions to sexual activities between men in the region are likely poor characterizations of MSM sexual risk. Combining a qualitative approach and triangulation of other research findings, adding predictor variables in the form of validated measures appropriate to the cultural setting, and providing survey instruments in native languages would support a more sensitive and robust instrument for measuring sexual risk activities in this population and is an opportunity for expanded research.

Efforts to engage regional governments, religious communities, and popular opinion leaders in a new dialogue concerning HIV transmission risk in the Middle East are warranted. Factors such as Islamic doctrines concerning MSM sexual behaviors and cultural traditions are not sufficient behavioral deterrents in preventing high-risk sexual activities between men in the Middle Eastern region as shown here. Unification of a rigorous research agenda that is free from political and religious influence is an important step forward in understanding the

epidemiology of HIV transmission paths in the Middle East. Abu-Raddad et al. (2010) stated that relaying on "cultural immunity" is not a sufficient approach any longer in preventing HIV transmission for the region.

Using the Internet as a vehicle in the region for social and sexual networking is evident and has been shown to be a useful platform for conducting research particularly in highly sensitive domains. The Internet may also serve as an alternate venue for displaying HIV education materials that emphasize lower risk sexual activities for high sexual-sensation seeking MSM (Noar, Zimmerman, Palmgreen, Lustria, & Horosewski, 2006). Harnessing the ubiquitous nature of the Internet provides a platform for positive social change through the creation of a positive social-sexual networking community to reach those at risk. When traditional MSM social gathering sites are lacking, the Internet offers new opportunities to serve as a conduit for the delivery of contemporary HIV education and prevention programs aimed at increasing variety and novelty of low-risk sexual activities. Despite numerous hurdles, adopting Internet-based, non-restricted HIV education and prevention public health programs in the Middle East could instrumentally enhance efforts toward reducing the likelihood of new HIV transmissions in MSM and their sexual partners ultimately contributing to an improved quality of life.

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