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# Gearing up for PrEP in the Middle East and North Africa: An initial look at willingness to take PrEP among young men who have sex with men in Beirut, Lebanon

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## Abstract

The Middle East and North Africa (MENA) is one of only two global regions where rates of HIV are currently on the rise. In Lebanon, new HIV infections are increasing most rapidly among young men who have sex with men (YMSM). While, the majority of YMSM in Lebanon report having recently engaged in condomless anal intercourse, many report reluctance to seek HIV prevention services for fear of stigma and discrimination. Pre-exposure prophylaxis (PrEP) is an effective alternative HIV prevention strategy but there is a dearth of research looking at willingness to take PrEP among YMSM in MENA. This study is the first to delineate factors associated with willingness to take PrEP among a cohort of 218 YMSM recruited from Beirut, Lebanon. Over half (55.5%) reported willingness to take PrEP. At the bivariate level, knowledge of HIV risk, awareness of PrEP, being in a relationship, greater judgementalism about sex in communication with peers, greater number of types of gay-related discrimination experienced, sense of community among YMSM, having had recent condomless anal sex with positive or

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*Informed Consent*: We obtained informed consent from all participants included in this study.

unknown status partner, and the use of substances just prior to or during sex were each associated with greater willingness to take PrEP. When entered into a linear regression analysis, use of substances just prior to or during sex and sense of community among YMSM remained significant predictors of PrEP willingness. Intervention efforts focused on increasing PrEP uptake among YMSM in MENA should consider the influence substance use and social factors on willingness to take PrEP.

### Keywords

Young men who have sex with men; PrEP; HIV-prevention; peer communication; gay community; substance use; Beirut; Lebanon

## INTRODUCTION

There remain a dearth of data on HIV prevalence and risk among men who have sex with men (MSM) in the Middle East and North Africa (MENA)[1]. The limited data that exist suggest that the MENA region has the most rapidly growing HIV epidemic of any region world-wide, with prevalence rates having doubled to half a million between 2001 and 2009[2]. The MENA is currently one of the only regions throughout the world that has not been able to curb rising HIV incidence rates[3].

Beirut, Lebanon is considered to be the most progressive city in the MENA region, with its proximity to Europe, religious diversity, and history of internal conflicts that have led to tolerance of cultural differences, enabling the gay community to make significant strides in its development. However, Beirut is also a city where HIV is increasing most rapidly among young MSM (YMSM)[2,4,5]. In Lebanon, the HIV rate in MSM is ~3.6%[6], compared to 0.1% in the general population[2]. In 2011, ~80% of new HIV cases in Lebanon were MSM, with over 40% under the age of 30[7,8]. The increase in HIV risk among MSM in Lebanon may be in part due to increased sexual freedom and social tolerance, Beirut's sex tourism, and MSM refugee migration from Syria and Iraq. However, YMSM report reluctance to seek HIV prevention services when the perceived likeihood of experiencing stigma, or anticipated stigma, and discrimination from service providers is high[9,10]. Lebanon lacks comprehensive HIV prevention and sexual health programs for MSM, as current efforts consist mostly of free HIV testing and counseling, and only very limited condom distribution and HIV awareness campaigns.

A review of MSM research in the MENA region reveals less then 40% report using condoms consistently[5], including in Lebanon[4]. The antiretroviral drug combination emtricitabine and tenofovir disoproxil fumerate taken as pre-exposure prophylaxis (PrEP) has been shown to be highly effective in preventing HIV infection[11–18]. A significant public health development, PrEP is now being widely promoted as an additional HIV prevention strategy for individuals in high-risk groups such as YMSM. However, data on willingness to take PrEP among YMSM in the MENA region is virtually non-existant. Like elsewhere in the region, PrEP is difficult for MSM to access in Lebanon, where the government has recently begun making free PrEP available only to heterosexual members of HIV serodiscordant

marriages, leaving MSM to seek the treatment from willing providers and to pay for the full cost.

There appear to be several paradoxical factors at play when considering both the risk and protective factors for HIV among YMSM in the MENA region. For instance, while rates of HIV are increasing most rapidly among YMSM in Beirut, Lebanon, likely in part due to increased sexual freedom and social tolerance, the region currently lacks comprehensive HIV prevention and sexual health programs for MSM. Further, while the majority of YMSM reported having engaged in recent condomless anal sex, the limited HIV prevention services offered in Beirut currently consist only of very limited free condom distribution and HIV awareness campaigns with no access to affordable PrEP for YMSM. Finally, although Beirut is considered to be the most progressive city in the MENA region, YMSM report many instances of enacted stigma and discrimination around their sexuality from healthcare providers, other clinic staff, and authorities and these experiences have been shown to be related to reluctance to seek HIV prevention services[19–21].

Kaufman and colleagues have previously suggested that the factors influencing HIV-related health behavior fall along multiple levels of a socioecological framework, made up of structural, institutional/healthcare system, community, interpersonal/network, and individual-level behavior change factors[22–24]. This framework aids in the conceptualization and measurement of factors influencing HIV prevention activities such as willingness to take PrEP. The current study sought to examine socioecological factors associated with willingness to take PrEP among a cohort of YMSM from Beirut, Lebanon. Because the willingness to take PrEP among people at risk for HIV depends greatly upon social understandings—that it is an effective, healthy, and socially acceptable strategy for preventing HIV—we hypothesized that both community-level and interpersonal/network-level variables would be significant correlates of willingness to take PrEP among these young men.

## METHODS

### Study Design and Participant Recruitment

The data for the analysis presented in this paper is drawn from the baseline data of an open trial of a community-based HIV prevention, sexual health promotion intervention that uses a longitudinal cohort to examine the intervention effects on the larger young MSM community. Recruitment of the cohort took place between July 2016 and March 2017 primarily using long chain peer referral methods (based on respondent-driven sampling methods), although other methods such as recruitment flyers, postings on social media and word of mouth were added near the end of recruitment in order to enable the study to reach its target sample. Eligibility criteria consisted of being assigned male sex at birth and currently male-identified, age 18 to 29 years, fluent in English or Arabic, residing in greater Beirut, and having had oral or anal sex with a man in the past 12 months. Men who self-reported being HIV-positive were excluded from the analysis for this paper.

For the long chain peer referral methods, recruitment began with a small number of eligible persons designated as “seeds”; these seeds were identified through community organizations

working with MSM and our community advisory board, and were purposively selected to be well-connected and to represent the diversity in the community. All participants, including seeds and those recruited through flyers, postings and word of mouth, received three recruitment coupons to recruit members of their social network, resulting in multiple waves of participants. Participants were instructed to give a coupon to eligible MSM peers who were interested in participating and to inform the recruit to call the study coordinator for coupon verification, eligibility screening, verbal consent procedures (conducted in English or Arabic, as preferred by the respondent), and scheduling of an interview. The survey interview was administered at the project office, by either an MSM or female interviewer, depending on the preference of the participant. Participants were compensated the equivalent of $40 for completing the interview, as well as $10 for each man (up to three) they recruited who enrolled in the study.

## Measures

The survey was administered in English or Arabic, depending on the preference of the participant, with computer-assisted interview software. The survey was developed in English and translated into Arabic using standard translation and back translation methods performed by experienced translators at the Lebanese American University; when discrepancies arose, the translators consulted with the study team and together as a group we reached consensus on the best translation to use. Participants were given the option of completing the survey on their own or having the interviewer administer the survey; 92% chose the interviewer-administered format. Corresponding to the socioecological framework that guided the analysis, the survey included measures related to the individual participant, their interpersonal or social relationships and interactions, their community, the institutional or health care system, and structural issues such as legal residency status, as well as the outcome measure of personal likelihood of using PrEP if it was available.

## Willingness to Use PrEP

Participants were first informed that “PrEP or Pre-exposure Prophylaxis is where someone who does not have HIV takes HIV medications to reduce the chances of being infected before being possibly exposed to HIV.” They were then asked to rate, “How likely would you be to use PrEP if it was available.” using a 4-point response scale from 1 ‘not at all likely’ to 4 ‘very likely’. We were unable to assess actual use of PrEP by the study participants, in large part because PrEP access and use in Lebanon was rare at the time of the baseline assessment.

## Individual Characteristics

**Sociodemographic and background characteristics** including age, education level, monthly income, HIV status, and history of sexually transmitted infections.

**Knowledge and attitudes related to HIV prevention:** *Knowledge of HIV risk* was assessed using a measure developed by Bingham et al.[25] in which respondents were asked to indicate whether 18 statements related to HIV risk were true or false (e.g., “Having a sexually transmitted infection does not affect a person’s risk of getting HIV”). *Awareness of PrEP* was assessed by a single item asking participants, “Have you heard of PrEP?”

*Motivation to engage in HIV protective behaviors* was measured with 3 items we developed, which asked respondents to rate on a scale of 1 (not at all) to 10 (very) how important it is for them to take care of their health, use condoms every time they have sex, and get tested regularly for HIV; Cronbach's alpha was .68.

**Sexual risk and skills related to risk reduction.—**To assess *condomless anal sex in the past three months with partners whose HIV status was believed to be positive or unknown*, respondents were asked to indicate how many times they had engaged in anal sex over the past three months, how many of those acts involved the use of a condom, and the perceived HIV status of the partners with whom condomless acts were engaged with. *Condom self-efficacy* was assessed using 6 items adapted from the Condom Use Self-Efficacy Scale[26], which asks respondents to rate their agreement with statements of confidence about being able to use condoms in various sexual scenarios. *Disclosure of sexual identity* was assessed by asking participants if at least one of their parents knew the respondent's sexual orientation.

**Psychosocial well-being.—**The 9-item Patient Health Questionnaire (PHQ-9)[27] was used to measure *depression*; the 9-item *Internalized Homophobia Scale*[28] measured internalized homonegativity, and measures of *substance use* included number of substances used in the past three months, and how often the participant "got high or had a few drinks immediately before or during sex" on a scale of 0 'never' to 3 'all the time'.

## Interpersonal Characteristics

**Social support.—***General social support* was assessed with 3 items from the Social Relationship Scale[29] that measure emotional, caregiver and tangible support. *Peer support for sexual health* was measured with two items developed by Bingham et al.[30] that asks respondents to rate their level of agreement with these statements: "I have friends who I can talk to if I find out I have a sexually transmitted infection" and "I have friends who I can talk to if I have unprotected sex".

**Sex-related communication with peers and sex partners.—***Judgmentalism in peer communication about sexuality* was assessed using an 11-item scale developed by Mutchler et al.[21] that measures how often respondents have expressed or felt judgmental attitudes with/by their peers when communicating about sexual behavior (e.g. "If I had sex without a condom, a friend would judge me for it"). *Peer communication regarding HIV prevention* was measured using an 8-item scale developed by Kegeles et al.[31] that asks respondents to report how often in the last 60 days that they and their MSM friends had talked about or encouraged each other to engage in HIV protective behaviors or given each other condoms to use or safe sex literature. *Communication with sex partners about HIV status and risk* was measured with two items developed by McFarland et al.[32], in which participants were asked to rate their level of agreement with "I always talk to my sex partners about HIV status and risk before having sex with them," and "If a partner tells me he is HIV negative, I always ask when he was last tested".

**Interpersonal sexual violence.—***Experience of adult sexual violence* in terms of being taken advantage of sexually in various types of situations was assessed with 4 items from the Community Attitudes on Sexual Assault (CASA) Survey developed by Massachusetts Institute of Technology[33].

**Relationship status** was assessed by asking participants if they were currently in a committed relationship.

## Community Characteristics

**Community engagement.—***Gay community integration* was measured with 4 items we developed that assess the proportion of social time spent with MSM, degree of being open about one's sexuality in various areas of one's life, and frequency of spending time at predominantly gay venues such as bars and coffee houses; Cronbach's alpha was .60. Individual items were also used to assess perceived *sense of community amongst MSM*, and perception of personally *being part of the MSM community*.

**Peer sexual health norms.—**This was measured using 6-items adapted from the Safer Sex Social Norm Perception Scale[34] which assesses the respondent's perception of their MSM friends' sexual health behaviors (e.g., condom use, HIV testing, discussing STIs with sex partners).

**Discrimination.—***Sexual minority-related discrimination* was measured with the 7-item subscale of the Multiple Discriminations Scale[35] that asks the respondent to indicate whether or not they experienced any of five types of discriminatory events (e.g., insulted or made fun of; denied or lost a job; physically assaulted) in the past year as a result of others thinking the respondent was gay or bisexual.

## Institutional/health system characteristics

*Experience of stigma from the health care system* was assessed by asking participants to rate how often they have felt "judged by my health care provider for my sexual behavior".

## Structural Characteristics

Respondents were asked whether or not they had *legal residency status* in Lebanon. The population of Lebanon has increased tremendously because of Syrian and other refugees, many of whom are not in the country legally.

## Data Analysis

Bivariate tests (two-tailed, independent t-tests and pearson correlation coefficients) were used to examine correlates between the reported likelihood of using PrEP and binary and continuous variables that were potential correlates. A linear regression model was then evaluated in which all statistically significant ($p<.05$) correlates of likelihood to use PrEP were included as independent variables. The regression model included a cluster adjustment to account for dependence among persons recruited by the same individual (via long chain referral recruitment). We used the Taylor series (linearization) method for computing cluster-

adjusted variances[36]. The cluster-adjusted regression analyses were conducted using SAS survey analysis procedures[37].

## RESULTS

### Sample characteristics

A sample of 226 YMSM enrolled in the study, of whom 8 (3.5% of whole sample) reported being HIV-positive, leaving 218 included in this analysis. Table 1 lists the characteristics of the sample. Most (61.5%) were under age 25, had received at least some university-level education (85.3%), and a quarter (25.0%) were in a committed relationship; 74.3% were born in Lebanon, and 82.2% self-identified as gay.

### Attitude towards use of PrEP, and its correlates among individual-, interpersonal- and community-level characteristics

When asked to indicate the likelihood that they would use PrEP, 99 (45.4%) said it was very likely, 22 (10.1%) said somewhat likely, 59 (27.1%) said somewhat unlikely, and 38 (17.4%) said it was not at all likely they would use PrEP; the mean score on this 4-point scale was 2.17 (SD=1.18).

The bivariate correlates of the likelihood of using PrEP are listed in Table 1. Among individual characteristics, knowledge of HIV risk, awareness of PrEP, having had recent condomless anal sex with partners whose HIV status was positive or unknown, and use of substances just prior to or during sex were all positively correlated with greater willingness to use PrEP. Among interpersonal variables, being in a relationship and greater judgmentalism in communication with peers about sex were both positively correlated with greater willingness to use PrEP, as were the community characteristics of a greater number of types of gay-related discrimination experienced, and perception of a sense of community among YMSM in Beirut. When these variables were entered into a linear regression analysis, use of substances just prior to or during sex, and perception of a sense of community among YMSM, were the only significant independent correlates of willingness to use PrEP, while knowledge of HIV risk and judgmentalism in peer communication about sex were marginal correlates (see Table 1).

## DISCUSSION

The majority of YMSM we surveyed in Beirut reported willingness to take PrEP. We suggest that as PrEP becomes more readily available in the MENA region, knowledge of HIV risk and PrEP increases, and more members of young men's social network begin to take PrEP, attitudes will likely shift and willingness to take PrEP will increase among a greater number of these YMSM. Importantly, a subset of YMSM who are likely to benefit greatly from PrEP (i.e., those who reported using substances prior to/during sex) reported greater willingness to take PrEP. This means that PrEP campaigns may be able to maximize prevention efforts by intitally targeting YMSM who report recently using substances. Initial linkage to PrEP should be made a priority for men who report using substances in the MENA region, as substance use prior to/during sex increases risk for HIV[38–42] and also may signify somone who is significantly more willing to take PrEP.

PrEP uptake can be best understood as a social process whereby attitudes and willingness to take PrEP among members of one's social network likely have a high degree of influence on YMSMs' willingness to take PrEP[43]. To that end, PrEP campaigns may maximize impact by accounting for the interpersonal/network- and community-level factors that are most associated with uptake. An important finding from this study was that greater judgmentalism about sex and sexual risk taking in communication with peers was moderately associated with greater willingness to take PrEP. While at first one might expect judgementalism in communication with peers to be negatively correlated with willingness to take PrEP due to fears of being further judged for taking PrEP, it is possible that YMSM engaging in more sexual risk may actually be more likely to experience judgmentalism from peers about their risky sexual behavior and to therefore be more aware of their own risk and thus willing to take PrEP to reduce their risk. Those YMSM who are judgmental of their peers for their risky sexual behavior may also be particularly concerned or vigilant about preventing HIV to safeguard against additional judgmentalism (both internalized and externally experienced) and may therefore be more willing to take PrEP themselves.

At the community-level, having a greater sense of community among YMSM was also associated with a greater willingness to take PrEP. YMSM who are more comfortable with their sexuality in Beirut may be more likely to be connected with other YMSM, to acknowledge their HIV risk, understand reasons to take PrEP, and thus be more willing to take it. This emphasizes, once again, the social nature of PrEP uptake because the willingness to take PrEP among people at risk for HIV depends greatly upon their social understandings of PrEP—that it is an effective, healthy, and socially acceptable strategy for preventing HIV. YMSM in Beirut who are more connected to a community of MSM may also be more likely to be knowledgeable about their sexual risk, to have previously heard of PrEP, and to be more willing to take PrEP themelves.

This study had several limitations that should be noted. First this was not a PrEP focused study, and therefore the number and depth of PrEP related-questions were limited. Had we provided more information about PrEP, some of these men might have felt differently about taking it. Secondly, this study did not measure actual PrEP uptake, rather we studied perceived willingness to take PrEP in the future, and the difference must be noted. Because of the low rate of PrEP uptake in the region, it seems essential for preliminary work to focus on assessing knowledge and attiudes towards PrEP. Furthermore, this measure of willingness to use PrEP did not specify that the modality of the treatment was oral pills (the modality currently available), which will limit the utility of these data as other modalities of PrEP become available. Another measurement limitation is the measure of disclosure of sexual identity, which was limited to parental awareness and did not include other members of young men's social networks (e.g., other family members, friends, classmates). Further, these data are cross-sectional in nature and as such, causal inferences should not be inferred. These YMSM also represented a sample of young men from Beirut who were comfortable enough with discussing their sexual minority status to engage in a study related to sexual minority health, and therefore the generalizability of these findings to YMSM throughout the greater MENA region may be limited. Further, some of the scales (i.e., motivation to engage in HIV protective behaviora and gay community engagement) had low internal reliability, which can attenuate observed correlations; the use of more reliable measures

could alter the direction and magnitude of the associations found in our analysis. Finally, willingness is but one of several factors in the uptake of PrEP; studies need to examine a greater number of the socioecological barriers (e.g., stigma, insurance and financial constraints, access to health care and prescription coverage, etc.) that may affect PrEP uptake for YMSM in the MENA. However, the current findings make a case for further research that takes a deeper look at those socioecological factors we found most associated with willingness to take PrEP among YMSM in the MENA region, specifically the interpersonal/network- and community-level factors that may be the most salient influencers of willingness to take PrEP.

This study was the first to assess willingness to take PrEP among YMSM from Beirut, Lebanon. The majority of these YMSM reported recent condomless anal sex, and willingness to take PrEP. The unfortunate reality for these YMSM is that PrEP is largely inaccessable and unaffordable in Beirut and the greater MENA region at this time. These findings delineate both a tremendous need and opportunity for public health researchers to work with Ministries of Health and policy makers to extend PrEP coverage and services to YMSM. Extending PrEP services to these YMSM will help to further empower them to take control of their sexual health, to protect themselves and the members of their social networks, and to combat the rising incidences of new HIV infections among YMSM communities in the MENA region.

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**Table 1.**

Bivariate and multivariate correlates of willingness to use PrEP

| Variable | Total Sample (n=218) [%; M(SD)] | Bivariate Correlates of PrEP Willingness [r; M(SD)] | Multivariate Correlates of PrEP Willingness [Beta (SE)] |
|---|---|---|---|
| **Individual characteristics** | | | |
| Age <25 years | | | |
| No | 38.5% | 2.64 (1.31) | |
| Yes | 61.5% | 2.40 (1.23) | |
| Any university education | | | |
| No | 14.7% | 2.34 (1.38) | |
| Yes | 85.3% | 2.52 (1.24) | |
| Low personal income | | | |
| No | 28.5% | 2.49 (1.29) | |
| Yes | 71.5% | 2.49 (1.26) | |
| History of any STI | | | |
| No | 65.1% | 2.56 (1.26) | |
| Yes | 34.9% | 2.38 (1.27) | |
| HIV risk knowledge | 12.8 (2.8) | .144 * | .043 (.026) T |
| Aware of what PrEP is | | | |
| No | 57.3% | 2.30 (1.26) ** | −.030 (.152) |
| Yes | 42.7% | 2.75 (1.22) | |
| Motivation for engaging in HIV protective behaviors | 9.10 (1.10) | −.103 | |
| Recent condomless anal sex w/ HIV+/unknown status partners | | | |
| No | 86.2% | 2.41 (1.26) * | .173 (.250) |
| Yes | 13.8% | 3.00 (1.20) | |
| Condom self-efficacy | 1.48 (.60) | .015 | |
| Parent(s) know respondent is MSM | | | |
| No | 58.4% | 2.44 (1.22) | |
| Yes | 41.6% | 2.61 (1.34) | |

| Variable | Total Sample (n=218) [%; M(SD)] | Bivariate Correlates of PrEP Willingness [r; M(SD)] | Multivariate Correlates of PrEP Willingness [Beta (SE)] |
|---|---|---|---|
| **Individual characteristics** | | | |
| Internalized homophobia | 1.50 (.67) | .015 | |
| Number of substances used in past 3 months | 1.90 (1.43) | .072 | |
| Uses substances prior to or during sex | | | |
| No | 58.1% | 2.34 (1.24)* | .405 (.149)** |
| Yes | 41.9% | 2.73 (1.26) | |
| Depressed | | | |
| No | 73.4% | 2.53 (1.22) | |
| Yes | 26.6% | 2.41 (1.38) | |
| **Interpersonal characteristics** | | | |
| Currently in a committed relationship | | | |
| No | 75.0% | 2.62 (1.26)* | −.078 (.170) |
| Yes | 25.0% | 2.09 (1.20) | |
| General Social Support | 4.32 (.97) | .028 | |
| Peer support for sexual health | 1.53 (1.06) | .057 | |
| Communication with sex partners about HIV risk | 2.53 (1.22) | .002 | |
| Judgmental communication among peers re. sex | 1.97 (.61) | .205** | .236 (.144)T |
| Sexual health advocacy with peers | 4.47 (6.53) | .086 | |
| Experiences of sexual violence | 0.76 (.89) | .083 | |
| **Community characteristics** | | | |
| Peer sexual health behavior norms | 2.16 (.58) | .002 | |
| Number of types of gay-related discrimination experienced | 1.72 (1.65) | .149* | .037 (.053) |
| Sense of community among YMSM in Beirut | | | |
| No | 71.9% | 2.35 (1.23)** | .516 (.174)** |
| Yes | 28.1% | 2.90 (1.25) | |
| Feels part of the YMSM community in Beirut | | | |
| No | 70.4% | 2.43 (1.25) | |
| Yes | 29.6% | 2.66 (1.26) | |

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| Variable | Total Sample (n=218) [%; M(SD)] | Bivariate Correlates of PrEP Willingness [r; M(SD)] | Multivariate Correlates of PrEP Willingness [Beta (SE)] |
|---|---|---|---|
| **Individual characteristics** | | | |
| Integration into the gay community | 2.26 (.84) | .050 | |
| **Institutional/health system characteristic** | | | |
| Perceived judgement from health provider re. sexual identity | 1.22 (.63) | .018 | |
| **Structural characteristic** | | | |
| Legal residency status in Lebanon? | | | |
| No | 14.2% | 2.29 (1.40) | |
| Yes | 85.8% | 2.53 (1.24) | |

$^{T}$p=.10

$^{*}$p<.05;

$^{**}$p<.01;

Note. SD = standard deviation; M = mean; SE = standard error; r = coefficient