

ORIGINAL ARTICLES

## Risk Factors for Anxiety Disorders among Men Who Have Sex with Men (MSM) in Vietnam

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### ABSTRACT

**Objectives:** To describe the prevalence of anxiety disorders among men who have sex with men (MSM) in Vietnam and associated risk factors.

**Method:** This is a cross-sectional study design, using the snowball sampling method to recruit participants. This study used the Generalized Anxiety Disorder 7-item Scale (GAD-7) to measure anxiety disorders. Other variables including socio-demographics and risk behaviors (diet, use of electronic devices, type of device used before sleep, sexual behavior in the past 30 days, condom use) were included in the questionnaire. Descriptive analysis and univariate, multivariate logistic regressions were performed.

**Results:** In total, 224 participants were enrolled in this study. The mean age was 26.3 years (SD= 4.7). Twenty-one percent of MSM reported having a poor diet. MSM participants mainly use 1-2 electronic devices before bed (67.4%), of which mobile phones are the most commonly used devices (80.8%). Three-quarters of the study participants had anxiety disorders (71.0%), of which 20.6% of them having moderate to severe anxiety disorders. Findings indicated that anxiety disorders were associated with poor diet (OR= 8.3; 95% CI= 2.5 – 27.0 and AOR= 8.8; 95% CI= 2.4 – 29.1).

**Conclusion:** Anxiety disorders are prevalent among the MSM population in Vietnam. Particularly, poor diet quality is associated with an increased risk of anxiety disorders in this population. We recommend developing healthy diet promotion activities, together with tailored and MSM-friendly integrated psychological counseling and interventions for the MSM population.

**Keywords:** Anxiety, mental health, men who have sex with men (MSM).

### INTRODUCTION

Increasing evidence suggests that individuals within the lesbian, gay, bisexual, transgender, intersex, queer/questioning, and other sexual minority (LGBTIQ+) community are at a higher risk of developing mental health disorders compared to their heterosexual counterparts (1). This disparity in mental health conditions among LGBTIQ+ individuals results from differences in social factors, experiences of discrimination,

lower levels of social support, and exclusion from healthcare services (2). A study in the United States revealed that gay and bisexual men were three times more likely to have severe depression compared to heterosexual men, and nearly 20% of gay men in general experienced two or more mental health disorders (3). Similarly, a meta-analysis by Meyer found that the prevalence of mood and anxiety disorders among gay, lesbian, and bisexual individuals was twice as high as that among heterosexual



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individuals (4). Steele's research findings indicated that the unmet mental healthcare needs of transgender and bisexual individuals were 2.4 and 1.8 times higher, respectively, compared to cisgender women. Transgender individuals experiencing depression also reported being untreated at a rate 1.6 times higher (2).

In the LGBTIQ+ community, men who have sex with men (MSM) are heavily affected by mental disorders (4). Among different disorders, anxiety is reported to be common and serious among MSM. A growing number of researchers focus on MSM's anxiety and report its severity (5). A systematic review and meta-analysis of Chinese MSM had twenty-seven studies reported the prevalence of anxiety symptoms, with a combined sample of 10,531 people, of whom 3187 (32.2%; 95% CI, 28.3–36.6) reported anxiety symptoms (6). The research on the increase in depression and anxiety among Australian Gay and Bisexual Men During COVID-19 restrictions showed that one in five (20.6%) participants (n=137) had increased anxiety; among these men, the mean GAD-7 score increased from 2.05 in 2019 to 10.22 in 2020 ( $p < 0.001$ ) (7). A recent study on anxiety and depression of HIV-negative MSM revealed a relatively high prevalence of both anxiety with over 56% of MSM having moderate and 11% having high anxiety, and depression with nearly 74% with low symptoms and 26% with high depression (1).

There are various factors affecting the increase in the prevalence of anxiety, including anal sex role, low educational level, female sexual partners, frequent searching for partners on the Internet, sexually transmitted diseases (STDs) diagnosed by doctors, and no HIV counseling (8). Other factors such as diet, use of electronic devices, and sexual activity,... were also found associated with the anxiety disorders of LGBTIQ+ population, particularly the MSM group (9-11). Particularly, MSM has faced homosexuality-related stigma and

discrimination, contributing to an increased risk of anxiety (12). In addition, the social acceptance of MSM was not high in most countries and regions, causing a certain degree of mental health problems among MSM population (8). Level of anxiety severity varied across different levels of social acceptance of MSM, and countries or regions (5).

In Vietnam, a study by Le Minh Giang, et al. on the risk of depression and anxiety among male sex workers in 2010-2011 revealed an anxiety rate of 19.0% (13). Similarly, another study by the Center for Applied Research on Men and Community Health (CARMAH) using the Depression Anxiety Stress – 21 items Scale (DASS - 21) in 2015 found a higher anxiety rate of 57.7% among this population (14). Accordingly, the prevalence of anxiety among MSM has been steadily increasing over time. A study by Vu Thi Bich Hong regarding adherence to ARV treatment among MSM showed an anxiety disorder rate of 46.7%, ranging from mild to severe levels. Increased anxiety levels negatively impact adherence to treatment and quality of life whereas enhanced quality of life factors positively influence treatment adherence (15). Sexual characteristics (sexual attractiveness, self-identified gender characteristics, having female partners, and engaging in unprotected anal sex) and drug use behaviors (alcohol, tobacco, methamphetamine, ecstasy, and heroin use) are identified as risk factors for anxiety (13).

However, research exclusively focusing on identifying behavioral risk factors to anxiety among MSM in Vietnam has been limited (16). This study aims to describe anxiety disorders among the MSM population in 2023 and identify several associated factors. Understanding the needs and recognizing the importance of mental health within the MSM population is essential for developing strategies and conducting interventions in public health research.

## METHODS

**Study design:** This is a cross-sectional study.

**Study subject:** Eligible people are those who self-identify as men who have sex with men. They must be living in Vietnam and having Vietnamese nationality at the survey time, aged from 18 years old and above, voluntarily agree to participate in this online survey. Those who were unhealthy or had cognitive impairment were excluded from the study.

**Study site and time:** This study was conducted from November 2023 to April 2024.

**Sample size and sampling method:** Because of the hard-to-reach population, snowball sampling was utilized to recruit participants. First, based on personal networks, we recruited an initial group of participants. Then, we asked them to invite their peers, friends or disseminate the recruitment information to their MSM network. The total number of participants was 224.

### Study variables

- Sociodemographic characteristics included age, education, occupation.
- Risk behaviors: diet, use of electronic devices, type of device used before sleep, sexual behavior in the past 30 days, condom use.
- The primary outcome is Anxiety disorders. We used the Generalized Anxiety Disorder 7–item Scale (GAD-7) (17). The GAD-7 is a brief measure used to assess generalized anxiety disorder, consisting of 7 questions that are easily scored and have high sensitivity (89.0%) and specificity (82.0%) for general population. This is a valid and effective tool for screening anxiety disorders and assessing their severity in practice and research. The GAD-7 describes the most prominent diagnostic features of the DSM-IV diagnostic criteria A, B, and C for generalized anxiety disorder. On the GAD-7, subjects are asked how often, during the last 2

weeks, they have been bothered by each of the 7 core symptoms of generalized anxiety disorder. Response options are “not at all,” “several days,” “more than half the days,” and “nearly every day,” scored as 0, 1, 2 and 3, respectively. Therefore, GAD-7 scores range from 0 to 21, with scores of 5, 10, and 15 representing mild, moderate, and severe anxiety symptom levels, respectively (18). The variables were re-defined as a binary variable (having anxiety disorder when the total score is  $\geq 5$  and no anxiety disorder when the total score is  $< 5$ ).

**Data collection:** This study involved a web-based anonymous survey. Data were collected in three months from 10/2023 to 12/2023. The questionnaire was designed using Kobotoolbox. The link to the questionnaire was sent to target participants who were then asked to disseminate it within their network.

**Data analysis:** Data were entered and managed using Kobotoolbox software and analyzed by STATA 16.0 software. Descriptive statistics was conducted. We calculated the mean, median, and standard deviation for quantitative variables and counts and proportions for qualitative variables. Univariate or multivariate regression models were performed to identify risk factors for anxiety disorders.

**Ethics approval:** All information on the study’s objectives and contents were provided to participants before they accessed to the survey link. The participation was completely voluntary. No identifiable information was collected. The study protocol and procedures were reviewed and approved by Hanoi Medical University (Decision Number 221/QĐ-DHYHN dated January 26, 2024).

## RESULTS

### Characteristics of study participants

#### *Socio-demographic characteristics and behaviors of study participants*

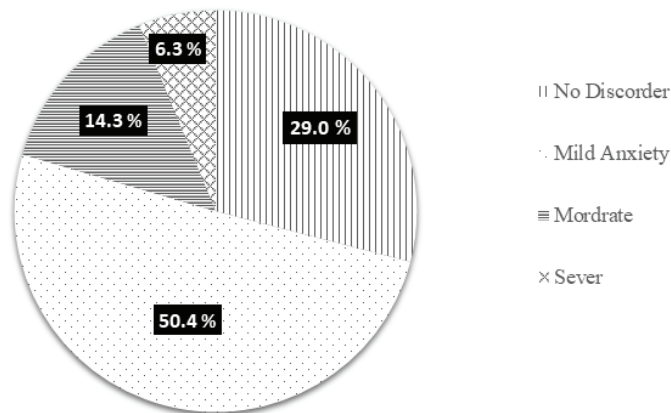
**Table 1. Socio-demographic characteristics and behaviors of study participants (n=224)**

	Characteristics	Frequency (n)	Percentage (%)
<b>Age</b>	<b>SD</b>	26.3 (±4.7)	
	18-24	82	36.6
	≥ 25	142	63.4
<b>Education</b>	High school and under	29	12.9
	University/college or higher	195	87.1
<b>Occupation</b>	Unemployed	45	20.1
	Employed	179	79.9
<b>Diet</b>	Poor	47	21.0
	Normal	129	57.6
	Good	48	21.4
<b>Use of electronic</b>	Do not use	8	3.6
	1-2 devices	151	67.4
	> 2 devices	65	29.0
<b>Type of device used before sleep</b>	Mobile phone	181	80.8
	Others	43	19.2
<b>Sexual behavior in the past 30 days</b>	Yes	162	72.4
	No	62	27.6
<b>Condom use</b>	Do not use	94	41.9
	< 50% of total time	25	11.2
	≥ 50% of total time	105	46.9

Table 1 shows that MSM participating in the study had an average age of 26.3 (SD: 4.3). Most participants had an education level of university/college or higher, accounting for 87.1%, and the majority were employed, with 79.9%. More than half of MSM report that their diet quality is normal (57.6%), the proportion of those with poor diet is equivalent to that of those with good diet.

MSM participants mainly use 1-2 electronic devices before bed (67.4%), of which mobile phones are the most commonly used devices (80.8%). 72.4% of MSM had sex behavior within 30 days before participating in the study, and the majority used condoms for more than 50% of all sexual encounters (66.1%).

**Anxiety disorders of MSM (n=224)**



**Figure 1. Levels of anxiety disorders among MSM**

The majority of MSM participants in the study had anxiety disorders (71.0%), of which more than half had mild anxiety disorders (50.4%). In contrast, the proportion of MSM

with moderate and severe anxiety disorders is 14.3% and 6.3%, respectively (Figure 1).

**Factors associated with anxiety disorders among MSM**

**Table 2. Factors associated with anxiety disorders among MSM**

Characteristics	Anxiety disorder		OR* (95%CI)	AOR# (95% CI)	
	n	%			
Age	18-24	63	39.6	1.5 (0.8 – 2.9)	0.8 (0.3 – 1.7)
	>=25	96	60.4	1	1
Education	High school and under	22	12.7	0.7 (0.3 – 1.8)	0.9 (0.3 – 2.2)
	University/college or higher	137	87.3	1	1
Occupation	Unemployed	34	21.3	1.3 (0.6 – 2.8)	1.2 (0.5 – 3.2)
	Employed	125	78.7	1	1
Diet	Poor	43	27.2	<b>8.3 (2.5 – 27.0)</b>	<b>8.8 (2.4 – 29.1)</b>
	Normal	89	55.9	1.7 (0.8 – 3.4)	1.6 (0.9 – 3.5)
	Good	27	16.9	1	1
Use of electronic	Do not use	6	3.8	1.2 (0.2 – 6.6)	1.1 (0.1 – 6.0)
	1-2 devices	107	67.3	1.0 (0.5 – 1.9)	1.0 (0.1 – 6.3)
	> 2 devices	46	28.9	1	1
Type of device used before sleep	Mobile phone	131	82.4	1.4 (0.6 – 2.8)	1.5 (0.6 – 3.2)
	Others	28	18.6	1	1
Condom use	Do not use	72	45.3	1.1 (0.4 -2.5)	1.5 (0.2 - 1.5)
	< 50% of total time	16	10.1	1.2 (0.4 – 3.3)	1.6 (0.3 – 1.2)
	≥ 50% of total time	71	44.6	1	1

\* OR: Odd Ratio

#AOR: Adjusted Odd Ratio

Univariate and multivariate logistic regression analysis found an association between poor diet and anxiety disorders (the reference variable is in the last row of the variable). Results showed that MSM individuals with poor diet had an increased risk of having anxiety disorders compared to those having good diet (OR= 8.3; 95% CI= 2.5–27.0 and AOR= 8.8; 95% CI= 2.4 – 29.1).

## DISCUSSION

The cross-sectional descriptive study recruited 224 MSM to participate in the study. The study participants were relatively young (the average is 26.3, SD = 4.7), and most had an education level above high school (87.1%). MSM participating in our study have socio-demographic characteristics that are relatively similar to studies estimating the general MSM population and studies on the mental health of MSM in Vietnam (19-20). Study results show that most study participants use at least one electronic device before sleeping (96.4%), of which the phone is the most commonly used device (80.8%). This result is similar to a 2019 study on students aged 18 to 25 years-old in Vietnam (21). Participants in that study are mainly young people, so they can quickly adapt to the development of social networks and technology. On the other hand, this adaptation also makes young people more likely to depend on electronic devices, including smartphones. Young people between 18 and 29 are the most popular users of smartphones and social networks in Vietnam (22).

This study used the GAD-7 scale to measure anxiety disorders in MSM. Although the GAD-7 scale has not been formally validated in Vietnam, it has been utilized to measure anxiety in a variety of Vietnamese populations (23). However, research in the German population has shown that the GAD-7 is effective in accurately assessing the symptoms

of generalized anxiety disorder. The questions on the scale effectively reflect common anxiety symptoms such as stress, worry, and discomfort in social situations. It can clearly distinguish between individuals with mild, moderate, and severe anxiety symptoms, aiding in the classification of the level of anxiety. This means that the GAD-7 can detect cases of anxiety effectively and is less likely to be confused with other conditions (18). Our study results show that up to 71.0% of study participants have anxiety disorders. This result is higher than the study using the GAD-7 scale in Vietnam in 2022 among MSM for ARV treatment (46.23%) (24). This difference may be due to different methods of recruiting participants and study sites. However, the results of our study also show similarities in the rate of severe anxiety disorders with the study among MSM on ARV treatment (24). Besides, our study results are also higher than the study in Vietnam in 2015 on male sex workers (57.7%) (14). This difference may result from two different measurement scales and study populations. Our study used the GAD-7 scale, while the 2015 study used the DASS-21 scale. In addition, our study population is men who have sex with men, which is a broader population and includes male homosexual sex workers. Compared to studies on gay and bisexual men in Australia (7), our study reveals that a higher proportion of MSM suffer from moderate to severe anxiety disorders (GAD-7 score greater than 10). The variation in study duration and sample size could cause this discrepancy. In recent years, MSM has become a population at high risk of HIV infection. Previous studies have shown that high-risk behavior and HIV infection are associated with psychological problems (26).

Univariate and multivariate logistic regression models showed an association between anxiety disorders and poor diet in the study participants. This result is similar to the study in the Netherlands in 2018 (27)

and Switzerland in 2022 (28). Mental health disorders, including anxiety disorders, have an impact on the diet of the patient and vice versa (29). Therefore, improving nutrition is one of the strategies that contribute to improving and reducing the incidence of anxiety disorders and other mental health disorders. In addition, while a study in China on MSM shows an association between educational attainment and anxiety disorders, our result shows no association between these two factors (26). Cultural differences between communities and countries may create different standards of educational attainment and differentially affect the mental health of MSM.

Results should be interpreted with respect to several limitations. First, the study was cross-sectional, so the cause-and-effect relationship of the study results was not assessed. Second, generalizability is another limitation of the study. Using the convenience sampling method through an online survey questionnaire, we may not generalize findings to the MSM population. Finally, we found several limitations regarding measurement. The GAD-7 scale may not fully capture different types of anxiety. In addition, information bias could occur as this is a self-report survey, so it could distort the outcome.

## CONCLUSION

Our study indicated a high prevalence of anxiety disorders among MSM (71,0%), and individuals with poor diets were statistically more likely to suffer from anxiety disorders. Consequently, promoting a healthy diet is one of the strategies that can help mitigate symptoms of anxiety disorders. Additionally, it is necessary to conduct further studies on different types of mental health disorders in addition to anxiety and other risk factors to have a comprehensive understanding of mental health problems among MSM population.

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