

Psychosocial Syndemic Associated with Magnifying Effect of Suicidal Ideation Among Sexually Transmitted Infection Patients in Shanghai, China

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Abstract

Background We sought to verify whether psychosocial health problems among patients with sexually transmitted infections (STIs) were associated with these patients' suicidal ideation, and to examine the magnifying effect of a syndemic of multiple psychosocial conditions on suicidal ideation. **Methods** This was a cross-sectional study of 519 STI patients at the Shanghai Skin Disease Hospital.

Sociodemographic, psychosocial, and suicidal ideation information on the participants was collected. Logistic regressions were performed to detect the association between sociodemographic variables and suicidal ideation, as well as each individual psychosocial variable and suicidal ideation, and to verify the syndemic effect of psychosocial factors. **Results** Of the participants, 25.0% reported having suicidal thoughts. In univariate analysis, low self-esteem, loneliness, depression, entrapment, defeat, and unsatisfied interpersonal needs were associated with suicidal ideation. Multivariable analysis found depression (risk ratio [RR] 2.614; 95% confidence interval [CI]: 1.603–4.262) and entrapment (RR: 4.457; 95%CI: 2.649–7.496) remained significant. STI patients who experienced two or more psychosocial health problems had approximately five times the odds of suicide ideation (adjusted risk ratio [ARR]: 4.643; 95%CI: 2.882–7.481) compared with those in the non-syndemic group, especially in the high-level (five or more psychosocial problems) group (ARR: 6.072; 95%CI: 3.307–11.152). **Conclusions** The study confirmed that STI patients have a high rate of suicidal ideation and suffer from severe psychosocial problems. The results confirm a syndemic effect of psychosocial problems on increasing the odds of suicidal ideation. This suggests greater attention should be paid to STI patients' psychosocial wellbeing in both nursing and interventions. Efforts to prevent suicidal ideation among STI patients are therefore urgently needed to ameliorate the social and health conditions of this population.

Background

Sexually transmitted infections (STIs) are among the most common acute conditions, and represent a substantive global public health concern, with an estimated annual worldwide incidence of 333 million cases¹. In China, the newly revised measures for prevention and control of STI diseases prioritize five types of STIs as needing prevention measures: syphilis, gonorrhea, condyloma acuminatum, genital herpes, and the human immunodeficiency virus (HIV)²⁻³. Against this backdrop, studies have reported dramatically higher suicidal ideation in China among people with STI, including people living with HIV/AIDS (PLWHA) compared with the general population (31%–43.1%⁴⁻⁶ vs. 2.3%, respectively⁷).

Previous studies revealed the association between certain psychosocial conditions and suicidal ideation. Studies have proven that low self-esteem and depression are the principal factors behind suicidal ideation⁸⁻¹⁸, and more-current articles have reported that loneliness, unsatisfied interpersonal needs, entrapment, defeat, and poor social support are also strong predictors of suicidal ideation^{12,14,19-21}. One study conducted in China reported that poor social support was the strongest predictor of suicidal ideation, in addition to depression and low self-esteem¹⁹. In two recent studies, one reported loneliness and low social support might represent the most important components of connectedness, as they were

found associated with depression severity and suicidality in United States, and another, in Swaziland, reported that feeling lonely was a risk factor for suicidal ideation²²⁻²³. Defeat and entrapment were key variables of Williams' cry of pain model of suicide, and central to O'Connor's integrated motivational-volitional (IMV) model²⁴⁻²⁵. Additionally, recently, Joiner proposed the interpersonal theory of suicide (IPTS)²⁶, which asserted that suicidal ideation emerges when individuals experience thwarted belongingness (TB; loneliness and lack of reciprocal care) and perceived burdensomeness (PB; perceived liability to others and self-hate).

Notably, some researchers have noted that participants with several psychosocial conditions have magnified suicidal ideation²⁷. We therefore wish to raise the "syndemic" theory. Syndemic as a term was first proposed by Singer to describe "synergistically related" epidemics that cluster and arise from harmful social conditions²⁸. A syndemic effect, or synergistic epidemic is the aggregation of two or more concurrent or sequential epidemics or disease clusters in a population with biological interactions, which exacerbate the prognosis and burden of disease. To our knowledge, most research on the mechanism of suicidal ideation among STI patients (including people with HIV) has typically focused on a single psychosocial factor^{6,w1-w2}. Another matter we realized is that these studies contain behavioral habits, risky sexual behaviors, unpleasant sexual experiences, and psychosocial conditions. Furthermore, some research has even considered STIs as a factor of the syndemic effect on suicidal ideation, while our present study focused particularly on STI patients' psychosocial issues^{28,w3-w4}. Only one study has discussed the association between a syndemic effect of psychosocial complements (depression, self-esteem, and social support) and suicidal ideation among HIV+ patients; that was in Nanjing, China^{w4}. Among other populations is a study our team conducted that proved the psychosocial syndemic effect (self-esteem, depression, social support, and loneliness) and suicidal ideation in men who have sex with men (MSM), also in China²⁹. The present study used defeat, entrapment, and poor interpersonal need as psychosocial factors in addition to depression, low self-esteem, loneliness, and poor social support, for uncovering whether the syndemic effect would be similar among STI patients, while considering the association with suicidal thoughts.

Our research aim herein is to verify two hypotheses: (1) STI patients suffer several psychosocial conditions that lead to suicidal ideation, and (2) there is a psychosocial syndemic associated with a magnifying effect in suicidal ideation among STI patients. If this is the case, attention should be directed to designing tailored, preventive strategies and holistic public health policies targeting STI patients.

Methods

Participants

This cross-sectional study, started in November 2017, was conducted for 6 months among STI clinic patients in two branch institutes of the Shanghai Skin Disease Hospital: Qiujiang Road and Baode Road

(both in the Jingan District). The hospital specializes in STIs and is one of the premier medical institutes in this field.

Eligibility criteria: This cross-sectional study was conducted in Shanghai among STI patients who attended the two abovementioned branches. Those who met the following criteria were invited: aged ≥ 18 years, clinically diagnosed with an STI disease, and able to read the informed consent form.

Exclusion criteria: The following patients were excluded: severe mental or cognitive impairment, unconsciousness, reluctance to cooperate, serious audio-visual impairment or poor reading ability, and/or unable to understand the study's aims and contents.

Sample size: Assuming prevalence of lifetime suicidal ideation in STI patients of 30.0%, using alpha of 0.05 and a relative error for sampling of 0.15, we calculated a required sample size of 415^{6,w5}. To allow for a 30% non-response rate, a total of 540 patients were recruited to participate in this investigation, and 519 (96.1%) valid questionnaires were collected.

Ethics

The Shanghai Jiao Tong University School of Medicine Public Health and Nursing Ethics Committee approved the present study (approval number: SJUPN-201702). Background information on the survey was given orally to all participants, after which they were given written informed consent forms. These set out the study's goal and procedures, as well as the potential risks. Written informed consent was obtained from all participants before the study began. During the recruitment and interview procedure, participants were free to ask any questions and to withdraw if they did not wish to continue.

Procedure

Our survey team signed cooperation agreements with the Shanghai Skin Disease Hospital before beginning the survey. All the doctors who worked in the STI department (inpatient or outpatient) were recruited and were informed about the survey beforehand. The doctors then informed each participant about the survey before each interview. All the interviewers were recruited from among senior medical students and graduate students at the Shanghai Jiao Tong University School of Medicine. They were trained before the interviews and had several in-person reviews throughout the study. The training also incorporated quality-control strategies, such as reexamining and investigating the questionnaires and resolving issues that may arise during the fieldwork. Interviewers carried out anonymous face-to-face interviews with the participants in a separate room to protect their privacy. All participants received 80 RMB (approximately US\$12) cash for their participation. Each participant received a copy of the survey, and the interviewers offered to read the questions to the participants if necessary.

Measures

Sociodemographic Variables

Sociodemographic variables included age, gender, educational level, marital status, residency, income, insurance, sexual orientation, and HIV status.

Suicidal ideation

Suicidal ideation was measured with one question⁶: “Have you ever thought about committing suicide?” (hereinafter defined as suicidal ideation; 0=no, 1=yes).

Psychosocial Variables

Self-esteem

Self-esteem was assessed based on the 10-item Rosenberg Self-Esteem Scale (SES). Low self-esteem was indicated with a result <29 (norm for a Chinese population in China was 28.75)^{w6} (Cronbach’s α : 0.847; range: 12–40).

Loneliness

The initial version of the UCLA Loneliness Scale used 20 questions (e.g., “I lack companionship”) designed to estimate participants’ loneliness and related emotional states^{w7}. Hays and DiMatteo identified a highly correlated alternative of eight items (ULS-8), to achieve similar reliability but reduce the respondent’s time burden and improve the quality of the data^{w8}. In this study we used the latter format (Cronbach’s α : 0.820; range: 8–32). The more loneliness the individual felt, the higher score that person would give, with a cut-off point set at the 75th percentile; a score of 18.

Depression

Depression level was gauged using the Patient Health Questionnaire-9 (PHQ-9), a brief screening tool comprising nine items that match diagnosis criteria in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*. Individuals were asked to recall how often they had been bothered by worrisome problems over the preceding 2 weeks. A cut-off point of an algorithm score of 5 showed good screening performance within various settings^{w9} (Cronbach’s α : 0.910; range: 0–27).

Entrapment

Evaluation of entrapment was quantified using the 16-question Entrapment Scale (ES)^{w10}, which reflected the escape motivation triggered either by perception of the outside world or internal feelings (Cronbach's α : 0.965; range: 0–64). Any report outcome higher than the 75th percentile—a score of 21—was defined as high entrapment.

Defeat

For the 16-item Defeat Scale (DS)^{w10}, participants were asked about how they had thought about themselves in the preceding 7 days. Their scores were calculated by summing the items for each scale (scored 0–4) (Cronbach's α : 0.886; range: 0–56). Any report outcome higher than the 75th percentile—a score of 23—was defined as high defeat.

Interpersonal Needs

Interpersonal needs were measured using the 15-item Interpersonal Needs Questionnaire (INQ-15) scale. Any report outcome higher than the 75th percentile score of 49 would be defined as unsatisfied with interpersonal needs (Cronbach's α : 0.855; range: 15–96).

Perceived Social Support

The Multidimensional Scale of Perceived Social Support (MSPSS) is a 12-item, seven-point Likert scale based on the self-reported measure of support received from family, friends, and other people of special significance. A higher mark indicated better social support, and the 25th percentile—score of 59—was adopted as the cut-off point (Cronbach's α : 0.947; range: 12–84).

Syndemic of psychosocial variables

If two or more psychosocial conditions were concurrent in a participant, we assumed there was a syndemic phenomenon^{w11}. A syndemic variable was created by counting the number of psychosocial factors. A participant with five or more concurrent psychosocial conditions was considered to have a high level of syndemic psychosocial variables; otherwise, the person had a low level.

Statistical Analysis

Statistical analysis was performed using IBM SPSS Statistics for Windows, Version 22.0 (IBM Corp., Armonk, NY, USA). First, baseline descriptive statistics were calculated to summarize sociodemographic characteristics, suicidal ideation, and psychosocial variables. Univariate analysis was then performed via binary logistic regression to detect the association between sociodemographic variables and suicidal

ideation, and between each individual psychosocial variable and suicidal ideation. Multivariable logistic regression was then conducted to evaluate the multiple risk factors associated with suicidal ideation after adjusting for significant sociodemographic variables. In the final stage, syndemic count variables were created by counting each individual's number of psychosocial health problems, and different groups were established based on the number of variables. After adjusting for all significant sociodemographic variables, univariate logistic regression analysis was performed to examine the psychosocial syndemic effect on suicidal ideation among these STI patients.

Results

A total of 519 patients (average age: 36.75 ± 11.523 years) were investigated. Table 1 shows participants' sociodemographic characteristics and their individual association with suicidal ideation. Four sociodemographic variables (age, marital status, income, and self-reported sexual orientation) showed significant relation to suicidal ideation. Participants aged <25 years had more than four times (odds ratio [OR]: 4.655; 95% confidence interval [CI]: 1.559–13.900) higher reports of suicidal ideation than those aged ≥ 60 years. Married participants, compared with unmarried, were less likely to have suicidal ideation (RR: 0.507; 95%CI: 0.330–0.777). The highest income group was less likely than the lowest to have suicidal thoughts (RR: 0.418; 95%CI: 0.214–0.816). Homosexual respondents were more likely to report suicidal ideation than heterosexual respondents (RR: 3.352; 95%CI: 1.587–7.084).

Table 1

Sociodemographic Characteristics and their Associations with Suicidal Ideation among Participating Sexually Transmitted Infection Patients (n=519)

Psychosocial Health Conditions Among STI Patients

Table 2 shows the psychosocial conditions of the study population and the relationship with suicidal ideation. Binary regression results showed that six of total seven psychosocial variables were significantly associated with suicidal ideation among participating STI patients (self-esteem, loneliness, depression, entrapment, defeat, interpersonal need). The multivariable logistic regression showed that only two psychosocial variables remained significant: entrapment (RR obtained from forward stepwise multivariate logistic regression using significant psychosocial variables of the univariate analysis as input [RRm]: 1.038; 95%CI: 1.015–1.061) and depression (RRm: 1.173; 95%CI: 1.073–1.206).

Table 2

Psychosocial Scales Scores and the Relationship with Suicidal Ideation Among Participating Sexually Transmitted Infection Patients (n=519)

Using the 75th percentile as the cut-off point, one-quarter of the participants were classified as lonely, at a high level of entrapment and defeat, and lacking in interpersonal needs. When using the 25th percentile

as the cut-off, three-quarters of the respondents were found to be lacking social support. About half (48.36%) showed depression via the PHQ-9. A total of 38.92% were found to have a low level of self-esteem (Table 3).

Table 3

Descriptive Analysis of Psychosocial Variables Among Participating Sexually Transmitted Infection Patients (n=519)

Psychosocial Health Conditions Associated with Suicidal Ideation

Table 4 summarizes the binary regression results. After adjusting for age, marital status, income, and self-reported sexual orientation, six of the seven total psychosocial variables constructed among syndemic psychosocial factors showed statistical significance with having suicidal ideation. Participants demonstrating a higher level of loneliness (adjusted risk ratio [ARR]: 2.261; 95%CI: 1.442–3.546), depression (ARR: 5.651; 95%CI: 3.469–9.206), entrapment (ARR: 5.156; 95%CI: 3.319–8.009), defeat (ARR: 3.503; 95%CI: 2.233– 5.496), unsatisfied interpersonal needs (ARR: 1.934; 95%CI: 1.240–3.015), or a low level of self-esteem (ARR: 2.370; 95%CI: 1.582–3.551) were at increased risk for suicidality. Social support was not significantly associated with suicidal ideation among these STI patients. However, the multivariable logistic regression showed that only two psychosocial factors remained significant: entrapment (RRm: 4.457; 95%CI: 2.649–7.496) and depression (RRm: 2.614; 95%CI: 1.603–4.262).

Table 4

Psychosocial Variables Associated with Suicidal Ideation Among Participating Sexually Transmitted Infection Patients (n=519)

Verification of Syndemic Effect of Psychosocial Variables

Table 4 shows the results of the final syndemic analysis. Generally, it was found that having at least two concurrent psychosocial health problems had a magnifying effect in fusing suicidal ideation (ARR: 4.643; 95%CI: 2.882–7.481). The low-level group (ARR: 4.086; 95%CI: 2.450–6.815) and high-level group (ARR: 6.072; 95%CI: 3.307–11.152) showed a prominent magnifying effect in thinking about suicide compared with those in the non-syndemic group.

Table 4

Association Between Number of Syndemic Problems and Suicidal Ideation Among Participating Sexually Transmitted Infection Patients (n=519)

Discussion

The rate of lifetime suicidal ideation among STI patients in Shanghai in our study was 25.0%; no similar data are available for comparison. Among PLWHA in our study (n=50), 18 showed suicidal ideation (36.0%), which is similar to numbers found in two other studies: 31.6% and 34.8% in China^{6,w11}. The present study found suicidal ideation was independently associated with six psychosocial conditions, though not social support. The most important finding herein is the syndemic effect of entrapment and defeat in addition to depression, self-esteem, interpersonal needs, loneliness, and social support in magnifying suicidal ideation among STI patients, especially in the high-level group.

The significant sociodemographic variables associated with suicidal ideation agreed with other studies^{w12}. Young participants were at a higher risk of suicidal ideation, possibly owing to higher impulsivity, lower ability to assume responsibility, and lower psychological ability to counteract feelings of vulnerability when faced with harsher social discrimination or mistreatment^{w13-w14}. Instrumental and emotional support, and financial ability to enable better treatment resources, may explain marital status and higher income as protective factors^{w15-w17}. Research has shown higher suicidality prevalence among male homosexual orientation, in line with the results of our present research^{w18-w19}. HIV status was not associated with suicidal ideation, which alerts us that STI patients without HIV may suffer the same high rate of ideation as that of HIV patients^{w20}.

Consistent with previous studies, our study found suicidal ideation was independently associated with low self-esteem, depression, loneliness, entrapment, defeat, and interpersonal need. According to cognitive theory, low self-esteem is processed in a typically negative manner, which leads to negative self-appraisal and later to suicidal ideation^{w21}. As suicidal ideation is among the diagnostic criteria for depression, its presence in and of itself will necessarily increase the number of depressive symptoms. Feeling lonely was associated with distress, which is strongly associated with generalized anxiety; panic attacks with suicidal ideation^{w22}. The association between loneliness and suicidality supports the theory that thwarted belongingness and perceived burdensomeness are major determinants of suicidality²⁶. The relationship between defeat, entrapment, and suicidal ideation is the motivational phase of the IMV model²⁵, and also established key variables within Williams' cry of pain theory of suicide²⁴. Previous research is equivocal regarding the relationship between social support and suicidal ideation.

When we included all psychosocial conditions in a single model, the association with suicidal ideation was removed for most psychosocial variables, though remained strongest for depression and entrapment. This should not be surprising, considering suicidal ideation and behavior are known as outcomes of feeling trapped in a stressful situation, with no evident escape or rescue possible^{w23}; this has been found in diverse populations and in the context of various disorders and research methodologies^{w17-w18}. Despite prevalence of poor psychosocial status among STI patients, huge gaps are still visible in concern and service, due to inadequate information and emotional support, and a shortage of qualified psychosocial professional treatment^{8,w24-w26}.

To show that suicidal ideation also co-occurs among STI patients, we have extended previous research that confirmed there was a syndemic effect on suicidal ideation in MSM²⁷. We confirmed all seven psychosocial health problems tend to co-occur and act to raise risk levels for suicidal ideation in these patients. However, the measurement of the syndemic construct is not invariant across groups; therefore, the construct's meaning also differs. A previous study showed syndemics are in fact a general human phenomenon, but their composition differs and the consequences are felt most deeply by those in the minority, such as MSM and men who have sex with men and women^{w27}. These results support the notion that syndemic theory has the potential to advance research, theory, and interventions related to suicidal ideation in this population.

Limitations and Future Research

Several limitations should be considered in interpreting the results from this study. First, cross-sectional surveys have difficulty determining causality; therefore, a prospective study would be beneficial. Second, although the participants came from a representative hospital, the sample size was not especially large; multi-center research is needed. Third, although privacy was ensured, investigators were trained, and doctors' cooperation ensured survey quality, self-reported and recall bias were unavoidable. Fourth, the syndemic effect examined classification variables using a cutoff point, which may not supply an adequate amount of information, although the results for continuous variables were similar.

CONCLUSIONS

This study extends the literature in several important ways. We demonstrated that not only PLWHA but also STI patients have high rates of suicidal ideation, and this population suffers from severe psychosocial conditions. The study confirmed a syndemic effect of psychosocial conditions on increasing odds of suicidal ideation. The collective findings suggest greater attention should be paid to STI patients' psychosocial wellbeing in both nursing and interventions, especially when their condition may lead to suicidal ideation, and/or the eventual irreversible outcome of suicide. Efforts to prevent suicidal ideation, as well as other mental problems, among STI patients are therefore urgently needed to improve the social and health condition of this population.

List Of Abbreviations

STI: Sexually transmitted infection

PLWHA: people live with HIV/AIDS

HIV: human immunodeficiency virus

IMV model: integrated motivational–volitional model

IPTS: interpersonal theory of suicide

TB: thwarted belongingness

PB: perceived belongingness

MSM: men who have sex with men

SES: Rosenberg Self-esteem Scale

ULS-8: 8-question UCLA Loneliness Scale

PHQ-9: 9-question Patient Health Questionnaire

ES: 16-question Entrapment Scale

DS: 16-item Defeat Scale

INQ-15: 15-item Interpersonal Need Questionnaire

MSPSS: Multidimensional Scale of Perceived Social Support

RR: risk ratio

CI: confidence interval

ARR: adjusted risk ratio

Declaration

Ethics approval and consent to participate

The Shanghai Jiao Tong University School of Medicine Public Health and Nursing Ethics Committee approved the present study (approval number: SJUPN-201702).

Consent for publication

Not applicable

Availability of data and material

All data generated or analysed during this study are included in this published article [and its supplementary information files].

Competing interests

All financial and non-financial competing interests must be declared in this section.

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Authors' contributions

Yong Cai substantially contributed to the conceptualization and design of this research, and to revising the manuscript. Jin Ma contributed to conceptualizing this manuscript and also wrote sections of the manuscript. Suping Wang assisted the study design, data collection, and registration of the data from hospital files, data analyses, data interpretation, and drafting the manuscript. Ruijie Gong contributed to data analyses, data interpretation, and to drafting and revising the manuscript. Yang Ni substantially contributed to the data collection and cooperation with the hospital.

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Tables

Table 1**Sociodemographic Characteristics and their Associations with Suicidal Ideation among Participating Sexually Transmitted Infection Patients (n=519)**

Sociodemographic Characteristics	Number of participants	Had suicidal ideation	
	n(column%)	n(column%)	OR(95%CI)
Case			
Outpatient	401(77.26)	98(24.44)	0.869(0.546-1.384)
Inpatient	118(22.74)	32(27.12)	1
Age group			
≤25	54(10.40)	25(45.45)	4.655(1.559-13.900)**
25-40	326(62.81)	85(26.07)	1.905(0.711-5.104)
41-59	107(20.62)	15(14.02)	0.880(0.293-2.643)
≥60	32(6.17)	5(15.63)	1
Gender			
Male	232(44.70)	50(21.55)	0.711(0.474-1.066)
Female	287(55.30)	80(27.87)	1
Education			
Middle School or less	114(21.97)	38(33.33)	1.574(0.985-2.517)
High School	98(18.88)	18(18.37)	0.708(0.399-1.258)
College degree or above	307(59.15)	74(24.10)	1
Current Marital Status			
Married	314(60.50)	63(20.13)	0.507(0.330-0.777)**
Divorce	32(6.17)	8(24.24)	0.673(0.284-1.597)
Widowed	10(1.93)	5(50.00)	2.019(0.560-7.273)
Unmarried(Single)	163(31.41)	54(33.13)	1
Income (RMB)			
≥12001	123(23.70)	22(17.60)	0.418(0.214-0.816)**
6001-12000	168(32.37)	41(25.00)	0.620(0.341-1.127)
3001-6000	155(29.87)	42(26.75)	0.714(0.392-1.299)

≤3000	73(14.07)	25(34.25)	1
Residence Status			
Local	227(43.74)	41(18.06)	0.651(0.393-1.078)
Stay less than 1 year	85(16.38)	29(34.12)	1.590(0.871-2.902)
Stay 1-5 year	65(12.52)	24(36.92)	1.712(0.920-3.186)
Stay more than 5 year	142(27.36)	36(25.35)	1
Self-reported sexual orientation			
Not sure	19(3.66)	6(31.58)	1.547(0.574-4.171)
Homosexuality	30(5.78)	15(50.00)	3.352(1.587-7.084)**
Bisexuality	13(2.50)	4(30.77)	1.490(0.450-4.936)
Heterosexuality	457(88.05)	105(22.76)	1
Insurance			
Have	466(89.79)	111(23.82)	0.560(0.307-1.020)
No	53(10.21)	19(35.85)	1
HIV Status			
Positive	50(9.63)	18(36.00)	1.673(0.888-3.151)
Unknown	218(42.00)	43(19.72)	0.817(0.520-1.283)
Negative	251(48.36)	69(27.50)	1
Have had suicidal thoughts in life time			
Yes	130(25.05)		
No	389(74.95)		

**p<0.01

Table 2**Psychosocial Scales Scores and the Relationship with Suicidal Ideation Among Participating Sexually Transmitted Infection Patients (n=519)**

Psychosocial variables	Mean	SD	RR(95%CI)	RRm(95%CI)
Self-esteem	29.68	4.25	0.905(0.861-0.951)**	
Loneliness	14.78	4.95	1.143(1.095-1.193)**	
Depression	6.28	5.40	1.212(1.156-1.270)**	1.173 (1.073-1.206)**
Entrapment	12.31	13.18	1.073(1.055-1.091)**	1.038(1.015-1.061)**
Defeat	15.55	11.04	1.073(1.052-1.093)**	
Interpersonal need	36.16	14.69	1.033(1.019-1.048)**	
Perceived social support	66.64	14.04	0.989(0.975-1.003)	

**p<0.01

Table 3**Descriptive Analysis of Psychosocial Variables Among Participating Sexually Transmitted Infection Patients (n=519)**

Psychosocial variables	Number	Percentage	Median
Self-esteem			
High level(score \geq 29)	317	61.08	29.00
Low level(score<29)	202	38.92	
Loneliness			
High level(score \geq 18)	129	24.86	14.00
Low level(score<18)	390	75.14	
Depression			
Yes(score \geq 5)	251	48.36	5.00
No(score \leq 5)	268	51.64	
Entrapment			
High level(score \geq 21)	123	23.70	8.00
Low level(score<21)	396	76.30	
Defeat			
High level(score \geq 23)	134	25.82	14.00
Low level(score<23)	385	74.18	
Interpersonal need			
High level(score \geq 49)	119	22.93	34.00
Low level(score<49)	400	77.07	
Perceived social support			
High level(score \geq 59)	385	74.18	70.00
Low level(score<59)	134	25.82	

Table 4**Psychosocial Variables Associated with Suicidal Ideation Among Participating Sexually Transmitted Infection Patients (n=519)**

Psychosocial Variables	n(column%)	RRu(95%CI)	ARR ^a (95%CI)	RRm ^b (95%CI)
Self-esteem				
Low level (score<29)	71(35.15)	2.370(1.582-3.551)**	2.082(1.356-3.197)**	
High level (score≥29)	59(18.61)	1	1	
Loneliness				
High level (score≥18)	52(40.31)	2.701(1.756-4.153)**	2.261(1.442-3.546)**	
Low level (score<18)	78(20.00)	1	1	
Depression				
Yes (score≥5)	104(41.43)	6.585(4.091-10.601)**	5.651(3.469-9.206)**	4.457(2.649-7.496)**
No (score<5)	26(9.70)	1	1	
Entrapment				
High level (score≥21)	63(51.22)	5.156(3.319-8.009)**	4.500(2.848-7.109)**	2.614(1.603-4.262)**
Low level (score<21)	67(16.92)	1	1	
Defeat				
High level	61(45.52)	3.827(2.494-5.873)**	3.503(2.233-5.496)**	

(score ≥ 23)

Low level	69(17.92)	1	1
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(score < 23)

Interpersonal need

High level	42(35.29)	1.934(1.240-3.015)**	1.838(1.149-2.941)*
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(score ≥ 49)

Low level	88(22.00)	1	1
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(score < 49)

Perceived social support

Low level	39(29.10)	1.326(0.854-2.061)	1.290(0.810-2.056)
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(score < 59)

High level	91(23.64)	1	1
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(score ≥ 59)

^aRisk ratios adjusted for age, marital status, income, self-reported sexual orientation

^bRisk ratios obtained from forward stepwise multivariable logistic regression using significant variables of the univariate analysis as input

*p < 0.05

**p < 0.01

Table 4**Association Between Number of Syndemic Problems and Suicidal Ideation Among Participating Sexually Transmitted Infection Patients (n=519)**

	Number (%)	had suicidal ideation	
		n(row%)	AOR (95%CI)
Have a syndemic			
No	262(50.48)	30 (10.45)	1
Yes	257(49.52)	100(38.91)	4.643(2.882-7.481)**
Number of syndemic problems			
No	262(50.48)	30(11.45)	1
Low level ^a	177(34.10)	62(35.03)	4.086(2.450-6.815)**
High level ^b	80(15.41)	38(47.50)	6.072(3.307-11.152)**

^aLow level: two to four psychosocial problems

^bHigh level: five or more psychosocial problems