

# Psychological health and well-being in patients with sexually transmitted infections: A prospective cross-sectional study

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## Abstract

**Background:** Patients with sexually transmitted infections (STIs) suffer not only with the physical problems but also with various psychological problems. Majority of bacterial STIs are treatable in a short period, while viral STIs may persist for longer duration or have frequent recurrences. **Aims and Objectives:** The aim of the study was To study different aspects of psychological health and well-being in patients with STIs. **Materials and Methods:** Study design was a prospective cross-sectional hospital-based study. Data were collected during July 2016–April 2018. STIs were divided into four groups (genital herpes, genital warts, and genital discharge and syphilis). One way analysis of variance and Scheffe Test were used for analysis of the data. **Results:** A total of 410 patients were included in the study. Majority of patients were suffering with genital herpes (139), followed by warts (104), discharge (92), and syphilis (75). Genital herpes and genital warts indicated significantly more cognitive affective (CA) depression as compared to the patients suffering with syphilis. Satisfaction with life was more with genital discharge and syphilis in comparison to the patients with genital warts and genital herpes. Genital herpes showed more perceived stress in comparison to genital discharge. Genital warts indicated more somatic depression as compared to syphilis and genital discharge patients while genital herpes showed more somatic depression than in patients suffering with genital discharge. Genital warts and genital herpes indicated significantly more overall depression as compared to the patients suffering with syphilis. **Conclusion:** Overall depression was more in patients with genital herpes and warts. The findings provide empirical bases for extended studies on behavioral intervention programs.

**Key words:** Affect, depression, perceived stress, satisfaction with life, sexually transmitted infections

## INTRODUCTION

Psychological distresses are commonly associated with sexually transmitted infections (STIs) and have been reported in viral STIs. Merin and Pachankis described interaction between psychological and physical health and highlighted that negative affect (NA) and poor coping may affect genital

herpes recurrences.<sup>[1]</sup> The highest frequency is observed in urban populations aged between 15 and 35 years.<sup>[2]</sup> STIs are common, diverse, and dangerous to health extending from bacterial diseases that may be readily treatable once

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diagnosed; to viral infections such as human immunodeficiency virus (HIV) that can be life threatening.

STIs have been euphemistically named as “social diseases” referring to social factors as important determinants of risk and case distribution of the diseases involving human sexual activity.<sup>[3]</sup> STIs are associated with an important psychological and social burden.<sup>[4]</sup> Individuals who have been diagnosed with STIs reported shame, anxiety, embarrassment, isolation, fear of rejection, and fear of not being sexually desirable.<sup>[5-8]</sup> Shame might be caused by the violation of some role or standard, the failure to meet expectations, or by a defect of the self that cannot easily be repaired.<sup>[9]</sup> The study was designed to highlight the pattern and its differences among STIs patients on affect (positive and negative), satisfaction with life, perceived stress, and depression (CA and somatic).

## MATERIALS AND METHODS

Study design was a cross-sectional hospital-based study. The study was performed at a tertiary health care center during July 2016–April 2018. Patients suffering with STIs were enrolled for the study. Diagnosis of STIs was done on the basis of history, clinical findings, and relevant laboratory tests. All the patients were subjected to rapid plasma regain (RPR) test and enzyme-linked immunosorbent assay for HIV-1 and 2. Inclusion criteria were patients with STIs with age between 15 and 70 years and given written consent to participate in the study (for the minor the consent of the parents was taken). Exclusion criteria were patients suffering with any other genital dermatological conditions, mentally ill, venerophobic, suffering from any systemic illness, and HIV infected.

### Sample size

The sample size was calculated using the following formula:

$$n = z^2_{1-\alpha/2} p (1 - p)/d^2$$

Where,  $p$  = prevalence = 0.50

$d$  = absolute precision = 0.05

$z^2_{1-\alpha/2} = 1.96$  (level of confidence of 95% at two-tailed test).

Using the above formula, sample size was found as = 384.

Assuming the 6% nonresponse/incomplete response rate, the effective sample size was =  $384 + 26 = 410$ .

### Tools for the study

The positive and NA Scale (PANAS).<sup>[10]</sup> Positive Affect (PA) reflects the extent to which a person feels enthusiastic, active, and alert. NA is a general dimension of subjective distress and unpleasurable engagement that subsumes a wide variety of aversive mood states. Both PA and NA schedules consist of 10 items in each to be rated on a 5-point scale ranging from very slightly or not at all (1) to extremely (5). The PANAS has been observed to have high internal consistency and construct validity.<sup>[10,11]</sup>

The satisfaction with life scale (SWLS)<sup>[12]</sup> measures global cognitive judgments of satisfaction with one's life. The task of the subject is to indicate how much he/she agree or disagree with each of the five items using a 7-point scale: (7) strongly agree to (1) strongly disagree. The internal consistency of the SWLS has been found to be excellent (alpha coefficients = 0.83–0.92), whereas the test–retest reliability for the total SWLS has been reported to be adequate ( $r = 0.65$ ). The SWLS has been replicated in a number of studies.<sup>[13,14]</sup>

The perceived stress scale (PSS)<sup>[15]</sup> is a measure of the degree to which situations in one's life are appraised as stressful. It is a multiple-item scale and was developed to measure the degree to which overall transactions with the environment were appraised as stressful.<sup>[16,17]</sup> PSS is a 10-item scale and it includes a number of direct queries about current levels of experienced stress. The questions asked about feelings and thoughts during the last month, along a 5-point scale ranging from never (0) to very often (4).

Beck's Depression Inventory-II (BDI-II)<sup>[18]</sup> is an inventory composed of 21 categories of symptoms and attitudes. Each category describes a specific behavioral manifestation of depression and consists of a graded series of 3–4 self-evaluative statements, from which the respondent has to select statement that describes the way they have been feeling during the past week. Numerical values from 0 to 3 are assigned to each statement to indicate the degree of severity/intensity, and the total added scores indicate the level of depression, whether mild, moderate, or severe, with higher scores reflecting more severe depression.<sup>[18]</sup> Alpha coefficient of the total scale was 0.89,<sup>[19]</sup> suggesting a high level of internal consistency of BDI-II. Many studies have

documented its internal consistency and supported its validity. The somatic factor and CA factor had alpha coefficients of 0.72 and 0.87, respectively, suggesting that they both showed high level of internal consistency.

STIs patients were categorized into four groups (genital herpes, genital warts, genital discharge: Urethral and vaginal and syphilis). They were individually investigated for studies on affect (positive and negative), satisfaction with life, perceived stress, and depression (CA and somatic).

### Statistical analysis

Respondent-wise scores on the specific items of the study variables (following the respective manuals) and results analyzed with the help of Statistical package for the social sciences 16.0 (IBM, Armonk, 19 NY:IBM Corp, Chicago, USA) Data were presented in number and percentage. One-way analysis of variance (ANOVA) for  $k = 4$  with unequal sample size and Scheffe Test for *post hoc* mean comparisons were used.

### RESULTS

A total of 463 cases were initially registered for the study. Nineteen cases of genital molluscum contagiosum, 9 cases of chancroid, 2 cases of lymphogranuloma venereum, and 23 cases of mixed infections were excluded from the study. Finally, 410 patients were included in the study. Majority of patients were males (67.80%) and married (51.50%). The most common age group was 26–40 years, followed by 15–25 years. In respect to educational qualifications, most of the patients were graduate and above (63.17%). Our patients mainly belonged to rural background (69%) and were Hindus (91.20%). According to profession, student was the most common category (33.70%), followed by government and private service class (23.20%). Genital herpes was the predominant STI category (33.90%), followed by genital warts (25.37%). Patients' characteristics are given in Table 1.

The mean  $\pm$  standard deviation (SD) of transformed scores on the study variables for the whole sample as well as the mean  $\pm$  SD values on the study variables for the four STIs groups are shown in Table 2. The “between groups” (four STIs groups) difference on the subscales/subfactors of the behavioral measures were highlighted by computing One-way ANOVA for  $k = 4$  with unequal sample size [Table 3] and *post hoc* mean comparisons [Tables 4-6]. Results revealed a significant difference between groups effects on

**Table 1: Patients' characteristics (n=410)**

Demographic variables	n (%)
Gender	
Male	278 (67.80)
Female	132 (32.20)
Marital status	
Married	211 (51.50)
Unmarried	199 (48.50)
Age range (years)	
15-25	178 (43.40)
26-40	212 (51.70)
>40	20 (4.90)
Educational qualification	
Up to primary school	21 (5.12)
Middle to intermediate school	130 (31.71)
Graduate	160 (39.02)
Post graduate and above	99 (24.15)
Residence	
Rural	283 (69.00)
Urban	127 (31.00)
Religion	
Hindu	374 (91.20)
Muslim	36 (8.80)
Family structure	
Joint	304 (74.10)
Nuclear	106 (25.90)
Category	
General	218 (53.20)
Other backward class	132 (32.20)
Schedule caste/Schedule tribes	60 (14.60)
Profession	
Student	138 (33.70)
Government/private service	95 (23.20)
Home maker	80 (19.50)
Self employed	55 (13.40)
Labourer/taxi driver	33 (8.00)
Farmer	9 (2.20)
STIs groups	
Genital herpes	139 (33.90)
Genital warts	104 (25.37)
Genital discharge: urethral and vaginal	92 (22.44)
Syphilis	75 (18.29)

STIs: Sexually transmitted infections

NA ( $F = 7.91$ ,  $df = 3/409$ ;  $P < 0.001$ ) in patients suffering with genital herpes ( $M = 9.87$ ) and genital warts ( $M = 9.73$ ). It was significantly more NA as compared to the patients suffering with genital discharge ( $M = 8.94$ ). Other comparisons revealed nonsignificant patterns of mean differences. On PA ( $F = 3.54$ ,  $df = 3/409$ ;  $P < 0.05$ ), patients suffering from genital discharge ( $M = 10.78$ ) indicated significantly more PA as compared to the patients suffering from genital warts ( $M = 10.19$ ) only. On satisfaction with life ( $F = 27.81$ ,  $df = 3/409$ ;  $P < 0.001$ ), patients suffering from genital discharge ( $M = 9.06$ ) and syphilis ( $M = 8.91$ )

**Table 2: Transformed mean±standard deviation of scores on various study variables according to disease categories**

Study variables	Mean±SD				
	Genital herpes (n=139)	Genital warts (n=104)	Genital discharge (n=92)	Syphilis (n=75)	Overall (n=410)
Negative affect	9.89±1.31	9.73±1.39	8.94±1.86	9.29±1.79	9.53±1.60
Positive affect	10.47±1.30	10.19±1.04	10.78±1.41	10.57±1.48	10.49±1.31
Satisfaction with life	7.87±1.32	7.96±1.17	9.06±1.04	8.91±1.12	8.35±1.30
Perceived stress	10.52±0.87	10.16±1.36	10.04±1.16	10.10±1.50	10.25±1.21
Cognitive affective	10.63±1.16	10.62±1.21	10.29±1.58	9.86±1.53	10.41±1.37
Somatic depression	6.13±0.76	6.25±0.77	5.78±1.11	5.77±1.11	6.01±0.94
Overall depression	12.22±1.17	12.27±1.19	11.77±1.60	11.41±1.38	11.98±1.36

SD: Standard deviation

**Table 3: Results of one-way ANOVA (for k=4 with unequal sample size) on the study variables**

Study variables	Sources of variation	Sum of squares	df	Mean square	F	P
Negative affect	Between groups	57.72	3	19.24	7.91	<0.001
	Within groups	987.95	406	2.43		
	Total	1045.67	409			
Positive affect	Between groups	17.94	3	5.98	3.54	0.015
	Within groups	686.77	406	1.69		
	Total	704.71	409			
Satisfaction with life	Between groups	117.46	3	39.15	27.81	<0.001
	Within groups	571.63	406	1.41		
	Total	689.09	409			
Perceived stress	Between groups	16.90	3	5.63	3.93	0.009
	Within groups	581.57	406	1.43		
	Total	598.47	409			
Cognitive affective	Between groups	35.33	3	11.78	6.50	<0.001
	Within groups	735.40	406	1.81		
	Total	770.73	409			
Somatic depression	Between groups	17.31	3	5.77	6.81	<0.001
	Within groups	343.95	406	0.85		
	Total	361.26	409			
Overall depression	Between groups	44.67	3	14.89	8.55	<0.001
	Within groups	706.72	406	1.74		
	Total	751.39	409			

**Table 4: Mean differences between groups on negative and positive affect**

Means	Negative affect			
	STIs groups			
	Genital discharge 8.94	Syphilis 9.29	Genital warts 9.73	Genital herpes 9.89
8.94	Xx	0.35	0.79**	0.95***
9.29		Xx	0.44	0.60
9.73			Xx	0.16
Means	Positive affect			
	STIs groups			
	Genital warts 10.19	Genital herpes 10.47	Syphilis 10.57	Genital discharge 10.78
10.19	Xx	0.28	0.38	0.59*
10.47		Xx	0.10	0.32
10.57			Xx	0.21

\*P&lt;0.05, \*\*P&lt;0.01, \*\*\*P&lt;0.001. STIs: Sexually transmitted infections

indicated significantly more satisfaction with life as compared to the patients suffering with genital warts (M = 7.96) and genital herpes (M = 7.87).

Perceived stress (F = 3.93, df = 3/409; P < 0.001) in patients suffering from genital herpes (M = 10.52) indicated significantly more stress as compared to

**Table 5: Mean differences between groups on satisfaction with life and perceived stress**

Means	Satisfaction with life			
	STIs groups			
	Genital herpes	Genital warts	Syphilis	Genital discharge
	<b>7.87</b>	<b>7.96</b>	<b>8.91</b>	<b>9.06</b>
7.87	Xx	0.09	1.04***	1.19***
7.96		Xx	0.95***	1.10***
8.91			xx	0.15
Means	Perceived stress			
	STIs groups			
	Genital discharge	Syphilis	Genital warts	Genital herpes
	<b>10.04</b>	<b>10.10</b>	<b>10.16</b>	<b>10.52</b>
10.04	Xx	0.06	0.12	0.48*
10.10		Xx	0.06	0.42
10.16			xx	0.36

\* $P < 0.05$ , \*\*\* $P < 0.001$ . STIs: Sexually transmitted infections**Table 6: Mean differences between groups on depression**

Means	Cognitive affective depression			
	STIs groups			
	Syphilis	Genital discharge	Genital warts	Genital herpes
	<b>9.86</b>	<b>10.29</b>	<b>10.62</b>	<b>10.63</b>
9.86	Xx	0.43	0.76**	0.77***
10.29		Xx	0.33	0.34
10.62			xx	0.01
Means	Somatic depression			
	Syphilis	Genital discharge	Genital warts	Genital herpes
		<b>5.77</b>	<b>5.78</b>	<b>6.13</b>
5.77	Xx	0.01	0.36	0.48**
5.78		Xx	0.35*	0.47**
6.13			xx	0.12
Means	Overall depression			
	Syphilis	Genital discharge	Genital herpes	Genital warts
		<b>11.41</b>	<b>11.77</b>	<b>12.22</b>
11.41	Xx	0.36	0.81***	0.86***
11.77		Xx	0.45	0.50
12.22			xx	0.05

\* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ . STIs: Sexually transmitted infections

patients with genital discharge ( $M = 10.04$ ) and that all other comparisons emerged to be more or less equal. On CA depression ( $F = 6.50$ ,  $df = 3/409$ ;  $P < 0.001$ ), patients with genital herpes ( $M = 10.63$ ) and genital warts ( $M = 10.62$ ) indicated significantly more CA depression as compared to the patients with syphilis ( $M = 9.86$ ), and all other comparisons emerged to be more or less equal. Somatic depression ( $F = 6.81$ ,  $df = 3/409$ ;  $P < 0.001$ ) in genital warts ( $M = 6.25$ ) indicated significantly more somatic depression as compared to the patients suffering with syphilis ( $M = 5.77$ ) and genital discharge ( $M = 5.78$ ). Furthermore, patients suffering with genital herpes ( $M = 6.13$ ) indicated significantly more somatic depression as compared to the patients suffering with genital discharge ( $M = 5.78$ ). All other three comparisons revealed nonsignificant patterns of mean difference.

Overall depression ( $F = 8.55$ ,  $df = 3/409$ ;  $P < 0.001$ ) in patients with genital warts ( $M = 12.27$ ) and genital herpes ( $M = 12.22$ ) indicated significantly more overall depression as compared to the patients with syphilis ( $M = 11.41$ ).

## DISCUSSION

Medical treatment may not be sufficient in the management of STIs patients. A lot of social stigma are attached with STIs in our society. Premarital and extra martial contacts are still not socially accepted in our culture. Studies on psychological aspects in patients with syphilis are very limited, and it has been never compared with viral STIs in best of our knowledge. The mean  $\pm$  SD values together with the range of scores for the whole sample coupled with the mean  $\pm$  SD values and range of scores



for the four STIs groups on study variables were computerized. Observations revealed that distribution of mean  $\pm$  SD values to be disproportionate, hence challenge the assumptions of parametric statistical analysis. Following these observations, the test scores were checked for homogeneity of variance. Results revealed significant Levene's ratios, suggesting heterogeneity of variance; therefore, the test scores of the study variables were transformed and analyzed by applying parametric inferential statistical methods. Majority of researchers had compared the trends of psychological outcomes but some had compared the mean of the trends. In the present study, we have compared the trends not the mean of the trends. A consistent pattern of mean differences (as observed in the present study) merits special mention that: (i) patients either suffering from genital herpes or genital warts (showing no reliable difference between them) generally manifest more cognitive and somatic depression, overall depression, perception of stress, and NA, than in patients suffering syphilis and genital discharge (showing no reliable difference between them), and (ii) patients suffering from syphilis and genital discharge indicated more satisfaction with life and PA as compared to the patients suffering with genital herpes and genital warts. Patients suffering with nonviral infections indicated more mean indices on these measures as compare to the patients suffering with viral STIs. In our study, only four groups of STIs were categorized due to very less number of other STIs. Majority of genital herpes cases were of recurrent genital herpes. Syphilitic patients were of primary, secondary, and latent cases. Urethral discharge patients comprised both gonococcal and chlamydial infections. In females, vaginal discharge included cervicitis (gonococcal and chlamydial), candidal vulvovaginitis, and bacterial vaginosis. Due to less number of urethral and vaginal discharges, both were included jointly in genital discharge category. Majority of our patients were students, educated, and internet friendly. After getting diagnosed and labeled with STIs, they used to get information through internet. In the case of genital herpes, they were mainly worried of its lifelong persistence, transmission, and disclosure to their life partner. Patients with genital warts were mainly concern with possibility of genital cancer development latter on. Some syphilitic patients had fear of cardio syphilis and neurosyphilis due to persistence of RPR test reactivity.

On the whole, the patients either suffering from genital herpes or genital warts generally manifested more NA, perception of stress, CA, somatic depression, and overall depression.

Qualitative studies revealed that acquiring genital herpes or genital warts has a profound impact on self-conceptualization,<sup>[20,21]</sup> which requires the individual to come to terms with their diagnosis and preexisting prejudices concerning the types of individuals who obtain STIs. The process of blending this new information was easier for individuals who did not hold strong prejudices or stereotypes regarding individuals who acquire STIs before their diagnosis.<sup>[20]</sup> However, among individuals who held strong preconceptions, this process takes longer and the psychosocial impact of the diagnosis appears to be stronger.<sup>[22]</sup> Quantitative studies also reveal that individuals report the highest levels of psychosocial distress immediately following a diagnosis.<sup>[22,23]</sup>

Individuals with external genital warts reported lower levels of quality of life than those who experience normal Pap smears or abnormal Pap smears that have not been confirmed with biopsy.<sup>[24]</sup> However, individuals with genital warts reported lower levels of quality of life than those with a biopsy confirmation on more global measures of well-being, despite having a medically less serious condition. Similarly, individuals who were diagnosed for herpes simplex virus 2 serologically without previous experience with symptoms displayed lower levels of prolonged distress than individuals with a history of herpes symptoms.<sup>[22,25,26]</sup>

Global measures of psychosocial well-being tend to suggest gradual coping with a genital herpes or genital warts diagnosis, disease-specific measures tend to suggest a prolonged period of increased psychosocial distress. Measures of general anxiety, depression, isolation, fear, and sadness have tended to show little to no difference from baseline among those newly diagnosed at 3-month follow-up.<sup>[25,26]</sup> A majority of participants report that herpes or genital warts negatively impacted their life or relationships.<sup>[21,27]</sup> The relationship between NA and physical health, conceptualizing NA as an umbrella for a range of negative mood states, such as anger, disgust, fear, scorn, and depression.<sup>[28]</sup>

Studies revealed that NA sparks two biological pathways: The hypothalamic-pituitary-adrenocortical axis, and the sympathetic-adrenal-medullary system. Both pathways are associated with heightened physiological responses such as high heart rate, high blood pressure, high levels of adrenaline, and high levels of cortisol, all of which are potentially detrimental to one's physical health. NA has direct, negative effects on immune functioning by prompting the release of various pituitary and adrenal

hormones, such as catecholamines and cortisol that modulate the immune system.<sup>[29]</sup> The end result of these pathways is the onset, flare-up, progression, and increase in the severity of a physical illness, ultimately leading to greater health-care seeking, disability insurance use, and symptom reporting.<sup>[30]</sup> Direct effects may include hormonal, metabolic, or neurochemical changes and indirect effects may be treatment side effects and sleep disturbances, perhaps as a result of pain and discomfort.<sup>[30]</sup> Behaviorally, one might adopt sick-role behaviors or experience a disrupted routine; instead of going to work daily activity normally. Maladaptive coping behaviors may also be adopted, which can lead to more NA. Cognitively, a physically ill individual may also experience thought distortions, perceived stress, perceived loss of control, and loss of self-efficacy.

## CONCLUSION

The findings of the study conclude that significant psychological distresses were in patients with viral STIs as compared to non-viral STIs.

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## Conflicts of interest

There are no conflicts of interest.

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