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# Psychiatric comorbidity in a sample of Egyptian women with vaginismus

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## Abstract

**Background:** Vaginismus is a female sexual dysfunction affecting the quality of women and the couple's relationship. It is considered the main feminine cause of unconsummated marriage in Egypt. The study aims in assessment of comorbid psychiatric disorders, personality disorders, and levels of alexithymia among a sample of women with vaginismus. It is a case-control study where 30 women diagnosed with vaginismus following up in the psychosexual clinic in Ain Shams University Hospitals were enrolled in the study in comparison to 30 controls. Assessment was done based on the socio-demographic data, Toronto Alexithymia scale (TAS-20), Structured Clinical Interview for DSM-IV-TR Axis I Disorders (SCID-I), and Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II).

**Results:** It was found that women having vaginismus had significant below university level of education ( $P = 0.026$ ) together with their partners ( $P = 0.006$ ). It was also found that women having vaginismus are showing high levels of alexithymia ( $p < 0.001$ ), more than one anxiety and/or depressive disorder ( $P = 0.032$ ) in comparison to the control group. Also, borderline personality disorder/traits and avoidant personality traits were significantly more frequent among cases ( $P = 0.026$ ,  $P = 0.001$ , and  $P = 0.045$  respectively). Moreover, it was found that having two or more of either of rigidity, perfectionism, dramatization, mood swings, and impulsivity was significantly more frequent among cases ( $P < 0.001$ ) showing a unique personality pattern of women with vaginismus.

**Conclusions:** Women with vaginismus were having higher levels of alexithymia, more developing anxiety, and depressive disorders than controls and they have specific personality characteristics.

**Keywords:** Vaginismus, Personality, FGM, Alexithymia, Psychiatric disorders

## Background

Vaginismus is one of the female sexual dysfunctions. It affects the quality of women and the couple's relationship. It is defined as the involuntary spasm of the pelvic muscles surrounding the outer third of the vagina, especially the perineal muscles and the levator ani muscles [1]. Regarding clinical diagnosis of vaginismus, it used to be in a separate entity in DSM-IV-TR. However, currently it is included with dyspareunia under the umbrella of genito-pelvic pain/penetration disorder in DSM-5 [2]. Available studies revealed that the incidence of vaginismus is about 1–7% and sometimes reaches 5–17% in clinical

settings [3]. Meanwhile, an Egyptian study showed much higher results as 20% of a total 200 randomly selected women were suffering from vaginismus [4].

There were many theories who tried to explain vaginismus. However, the fear-avoidance model was one of the main models and was able to postulate the disorder [5].

Studies showed that the most frequently associated psychiatric disorders with sexual issues are major depressive disorder and anxiety disorders [6]. As for personality disorders, more cluster A and C characteristics were noticed than cluster B in association with sexual dysfunctions generally [7].

Moreover, alexithymia is considered the lack of the ability to recognize and express emotions and feelings [8]. People with alexithymia are more prone to physical symptoms upon psychological distress [9].

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Finally, the study hypothesizes that *vaginismus* is associated with higher level of alexithymia, other psychiatric disorders, personality disorders and traits. It also highlights on different personality traits associated with *vaginismus*.

## Methods

This is an observational case control study. A sample of 30 women diagnosed with *vaginismus* according to DSM-IV-TR and meeting both the inclusion and exclusion criteria was enrolled in the study. The cases were recruited from the psychosexual clinic in Ain Shams University Hospitals, Cairo, Egypt.

On the other hand, 30 sexually active women were randomly selected among the relatives of patients and workers at the hospital to be used as control group. Sampling of controls was according to convenient sampling. Selection was according to the following inclusion and exclusion criteria mentioned afterwards.

Inclusion criteria were being in 18–45 years age range, being married or sexually active and consenting to participate in the study for both cases and controls. As for cases only, was being diagnosed as *vaginismus* patient according to DSM-IV-TR criteria for diagnosis. Meanwhile, exclusion criteria included the presence of another medical or neurological disorder, the presence of any current gynecological illness diagnosed by a gynecologist, and the presence of paraphilia or gender identity disorder.

All patients and controls involved in the study were subjected to an informed written consent was obtained from the patients after explaining the objectives of the study. This was followed by the identification of personal data, socio-demographic data, the educational level, the presence of female genital mutilation (FGM), and the partner's educational level. Toronto Alexithymia Scale (TAS20) was used. It is a 5-point Likert scale for assessment of alexithymia [10]. A validated, reliable Arabic version of TAS20 was used [11]. Moreover, a structured clinical interview for DSM-IV Axis I Disorders (SCID-I) was used for assessment of the presence of different psychiatric disorders [12]. The used version was a validated and reliable Arabic one [13]. As for assessment of different personality disorders, a structured clinical interview for DSM-IV Axis II Disorders (SCID II) was used. Results are either reaching a threshold for diagnosis of a personality disorder or sub-threshold for diagnosis of personality traits [14]. Also, the used version was a validated and reliable Arabic one [15].

## Statistical analysis

The collected data were coded, tabulated, and statistically analyzed using IBM SPSS statistics (Statistical Package

for Social Sciences) software version 28.0, IBM Corp., Chicago, USA, 2021. Quantitative data tested for normality using Shapiro-Wilk test, then if normally distributed described as mean  $\pm$  SD (standard deviation) as well as minimum and maximum of the range, then compared using independent *t* test. Qualitative data described as number and percentage and compared using chi-square test and Fisher's exact test for variables with small expected numbers as well as linear by linear association in cases of ordinal variables. Logistic regression was used to find out factors affecting having *vaginismus*. The level of significance was taken at *P* value  $<$  0.050 was significant, otherwise was non-significant.

## Ethical considerations

All procedures were reviewed and approved by the Ethical Committee of Faculty of Medicine, Ain Shams University (FWA: 00017585). Also, a written informed consent was obtained from all participants involved in the study. The consent also included publishing the results of the study with keeping the anonymity of both cases and controls.

## Results

Thirty two cases were recruited in the study and 30 controls volunteered to share. However, two cases were excluded. The first one was due to the development of the disorder after the first delivery with faulty suturing of episiotomy. While the other one, the condition was associated with painful vaginal discharge.

## Age and socio-demographic data

There was insignificant statistical difference in age ( $p = 0.182$ ), residence ( $P = 0.999$ ), adequacy of monthly income ( $P = 0.083$ ), and FGM ( $P = 0.136$ ) between both cases and controls. However, being unemployed (non-working) ( $P = 0.005$ ), below university education ( $P=0.026$ ) and having a partner of below university education too ( $P = 0.006$ ) were more frequent among cases and the difference was statistically significant. Also, it was found that 25% of the entire sample ( $n = 15$ ) had FGM. The mean age in both cases and controls was 8.96 years ( $SD \pm 3.6$ ) (Table 1).

## Toronto Alexithymia Scale (TAS20)

Cases were showing more alexithymia than controls in both total scores and categorical division of the results ( $P < 0.001$  in both) which was statistically significant (Table 1).

**Table 1** Socio-demographic characteristics among the studied groups

Items		Vaginismus (N = 30)	Control (N = 30)	p value
Age (years)	Mean ± SD	29.7 ± 4.8	31.1 ± 3.1	<sup>a</sup> 0.182
	Range	18.0–40.0	25.0–39.0	
Residence	Urban	27 (90.0%)	28 (93.3%)	<sup>c</sup> 0.999
	Rural	3 (10.0%)	2 (6.7%)	
Work	Working	16 (53.3%)	26 (86.7%)	<b><sup>b</sup>0.005<sup>e</sup></b>
	Not working	14 (46.7%)	4 (13.3%)	
Income	Adequate	15 (50.0%)	20 (66.7%)	<sup>d</sup> 0.083
	Borderline	12 (40.0%)	10 (33.3%)	
	Inadequate	3 (10.0%)	0 (0.0%)	
Education	Below university	8 (26.7%)	1 (3.3%)	<b><sup>c</sup>0.026<sup>e</sup></b>
	University or higher	22 (73.3%)	29 (96.7%)	
Partner education	Below university	9 (30.0%)	1 (3.3%)	<b><sup>b</sup>0.006<sup>e</sup></b>
	University or higher	21 (70.0%)	29 (96.7%)	
FGM		10 (33.3%)	5 (16.7%)	<sup>b</sup> 0.136
Toronto Alexithymia total score	Mean ± SD	57.0 ± 12.2	38.2 ± 7.2	<b><sup>a</sup>&lt; 0.001<sup>e</sup></b>
	Range	35.0–82.0	27.0–52.0	
Toronto Alexithymia categorical grades	No	12 (40.0%)	28 (93.3%)	<b><sup>d</sup>&lt; 0.001<sup>e</sup></b>
	Possible alexithymia	6 (20.0%)	2 (6.7%)	
	Alexithymia	12 (40.0%)	0 (0.0%)	

Data presented as number and percent unless mentioned otherwise

<sup>a</sup> Independent t test

<sup>b</sup> Chi-square test

<sup>c</sup> Fisher's exact test

<sup>d</sup> Linear by linear association

<sup>e</sup> Significant

### Structured Clinical Interview for DSM-IV-TR Axis I Disorders (SCID-I)

Upon application of SCID-1, 33.3% of cases ( $n = 10$ ) have a depressive disorder(s) including any of the current major depressive episode, previous major depressive episode(s), and dysthymia. While 26.6% of them ( $n = 8$ ) have an anxiety disorder(s) including any of the current generalized anxiety disorder, previous generalized anxiety disorder, a current panic disorder, previous panic disorder, specific phobia, and obsessive compulsive disorder.

There were neither cases nor controls diagnosed with a psychotic disorder or bipolar mood disorder or substance use disorder. There was no statistically significant difference between both cases and controls in any of the tested disorders alone. However, the presence of one or more than one disorder regardless its type was statistically more frequent among cases than controls ( $P = 0.032$ ) (Table 2).

### Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II)

Upon application of SCID-2, results regarding different personality disorders were obtained. The results were

either positive regarding all traits needed for diagnosing a personality disorder or they were sufficient to diagnose the presence of some personality traits only but not reaching the threshold for diagnosis of a disorder. Therefore, the results obtained are presented into either a personality disorder or personality traits. The later (personality traits) contains also those who have disorder in this category as they have all the traits besides those who have some traits only.

There were no cases who had cluster A personality disorders (and/or traits) ( $n = 0$ ); however, the difference between cases and controls was statistically insignificant. Meanwhile, all cases belonged to either cluster B and/or cluster C personality disorders. It was found that borderline personality disorder/traits (BPD) were more common among cases than controls where  $P = 0.026$  and  $P = 0.001$  respectively and the difference was statistically significant. Also, avoidant personality traits were more frequent among cases than controls ( $P = 0.045$ ) and the difference was statistically significant too. However, there was no statistically significant difference between cases and controls according to the rest of cluster B and C personality disorders types (Table 3).

**Table 2** SCID-1 among the studied groups

DSM-IV-TR code	Disorder	Vaginismus (N = 30)	Control (N = 30)	p value
269.20–269.26	A current major depressive episode	6 (20.0%)	2 (6.7%)	<sup>b</sup> 0.254
269.30–269.36	Past major depressive episode(s)	7 (23.3%)	4 (13.3%)	<sup>a</sup> 0.317
300.4	Dysthymic disorder	2 (6.7%)	1 (3.3%)	<sup>b</sup> 0.999
300.02	Generalized anxiety disorder currently	5 (16.7%)	1 (3.3%)	<sup>b</sup> 0.195
300.02	Generalized anxiety disorder previously	7 (23.3%)	2 (6.7%)	<sup>b</sup> 0.145
300.01/300.21	A current panic disorder	1 (3.3%)	0 (0.0%)	<sup>b</sup> 0.999
300.01/300.21	Panic disorder previously	1 (3.3%)	0 (0.0%)	<sup>b</sup> 0.999
300.29	Specific phobia	1 (3.3%)	0 (0.0%)	<sup>b</sup> 0.999
300.3	Obsessive compulsive disorder	2 (6.7%)	0 (0.0%)	<sup>b</sup> 0.492
295.10–295.90/297.1/297.3	Psychotic disorders	0 (0.0%)	0 (0.0%)	NA
296.00–296.06 and 269.80–296.89	Mania/hypomania	0 (0.0%)	0 (0.0%)	NA
304.00–.90/305.20–.90	Substance use disorder	0 (0.0%)	0 (0.0%)	NA
304.00–.90/305.20–.90	Substance abuse (non-dependence)	1 (3.3%)	0 (0.0%)	<sup>b</sup> 0.999
<b>Disease number</b>	<b>0</b>	15 (50.0%)	23 (76.7%)	<b><sup>a</sup>0.032<sup>c</sup></b>
	<b>≥ 1</b>	15 (50.0%)	7 (23.3%)	

Data presented as number and percent unless mentioned otherwise. NA not applicable

<sup>a</sup> Chi-square test

<sup>b</sup> Fisher's exact test

<sup>c</sup> Significant

There were some specific personality traits that were observed to be present repeatedly during application of SCID-2 on cases. These traits include rigidity, perfectionism, dramatization, mood swings, and impulsivity.

It was found that rigidity, mood swings, and impulsivity were more frequent among cases ( $P = 0.032$ ,  $P = 0.004$ , and  $P < 0.001$  respectively) and this was statistically significant. Moreover, the presence of two or more of the specific personality traits was more frequent among cases ( $P < 0.001$ ) than controls and the difference was statistically significant too (Table 3).

Finally, different factors were studied by logistic regression model in order to find significant independent factors that increase the likelihood of having vaginismus. It was found that having a partner below university education ( $P = 0.006$ , OR = 100.01), possible alexithymia or alexithymia (measure by TAS20) ( $P = 0.004$ , OR = 46.46), and two or more of the specific personality traits found (measured by SCID-2) ( $P = 0.002$ , OR = 37.28) statistically were significant independent factors increase the likelihood of having vaginismus (Table 4).

## Discussion

Vaginismus is considered one of the most present but unspoken disorders affecting sexual life among Egyptians. Unfortunately, the misconception of an extremely painful first intercourse after marriage is still a problem facing many Egyptian women till now. Consequently,

it has been considered for a long time the main feminine cause of unconsummated marriage in Egypt [16]. Although, people are convinced with the importance of sex education, yet sex is still considered a taboo. The concept of “the culture of silence” is the unfortunately main one among the Egyptian population [17].

This study is focusing on its both psychiatric aspects of vaginismus whether psychiatric comorbidities, comorbid personality disorders, and alexithymia.

Regarding the personal and socio-demographic data, both cases and controls enrolled in the study were of nearly similar age group with mean age of 29.7 years, median 30 and 31.1 years, median 30.5 respectively. This age group lies within the age range of marriage in Egypt being between 25 and 49 (median 20.8) according to the background characteristics [18]. As regards the residence, 91.6% of both cases and controls were in urban places this could be explained by the presence of the hospital in an urban catchment area. As for the educational and economic level, the study showed that below university education and unemployment were significantly more frequent among cases ( $P = 0.026$  and  $P = 0.005$  respectively). In fact, efforts were made to have a matching control sample. However, in order to find a control group that would agree to participate in a study on such a culturally sensitive topic, it was easier to recruit them from people with higher education which explains why the control group had significantly

**Table 3** SCID-2 among the studied groups

Items	Personality disorders			Personality Traits		
	Vaginismus (N = 30)	Control (N = 30)	p value	Vaginismus (N = 30)	Control (N = 30)	p value
<b>Cluster A personality disorders</b>						
Paranoid personality	0 (0.0%)	2 (6.7%)	<sup>a</sup> 0.492	0 (0.0%)	3 (10.0%)	<sup>a</sup> 0.237
Schizoid personality	0 (0.0%)	1 (3.3%)	<sup>a</sup> 0.999	0 (0.0%)	3 (10.0%)	<sup>a</sup> 0.237
Schizotypal personality	0 (0.0%)	0 (0.0%)	NA	0 (0.0%)	0 (0.0%)	NA
<b>Cluster B personality disorders</b>						
Histrionic personality	2 (6.7%)	0 (0.0%)	<sup>a</sup> 0.492	9 (30.0%)	7 (23.3%)	#0.559
Narcissistic personality	0 (0.0%)	0 (0.0%)	NA	1 (3.3%)	3 (10.0%)	<sup>a</sup> 0.612
Borderline personality	8 (26.7%)	1 (3.3%)	<sup>a</sup> 0.026 <sup>b</sup>	15 (50.0%)	3 (10.0%)	#0.001 <sup>b</sup>
Antisocial personality	0 (0.0%)	0 (0.0%)	NA	0 (0.0%)	0 (0.0%)	NA
<b>Cluster C personality disorders</b>						
Avoidant personality	5 (16.7%)	3 (10.0%)	<sup>a</sup> 0.706	12 (40.0%)	5 (16.7%)	#0.045 <sup>b</sup>
Dependent personality disorder	4 (13.3%)	1 (3.3%)	<sup>a</sup> 0.353	10 (33.3%)	10 (33.3%)	#0.999
Obsessive compulsive personality	7 (23.3%)	3 (10.0%)	#0.166	17 (56.7%)	12 (40.0%)	#0.196
Passive aggressive personality disorder	2 (6.7%)	0 (0.0%)	<sup>a</sup> 0.492	3 (10.0%)	0 (0.0%)	<sup>a</sup> 0.237
<b>Specific personality traits</b>						
Rigidity	15 (50.0%)	7 (23.3%)	<b>#0.032<sup>b</sup></b>			
Perfectionism	15 (50.0%)	10 (33.3%)	#0.190			
Dramatization	7 (23.3%)	6 (20.0%)	#0.745			
Mood swings	13 (43.3%)	3 (10.0%)	<b>#0.004<sup>b</sup></b>			
Impulsivity	14 (46.7%)	1 (3.3%)	<b>#&lt; 0.001<sup>b</sup></b>			
Number of personality traits	<b>0–1</b>	8 (26.7%)	23 (76.7%)	<b>#&lt; 0.001<sup>b</sup></b>		
	<b>≥ 2</b>	22 (73.3%)	7 (23.3%)			

Data presented as number and percent unless mentioned otherwise. NA not applicable

#chi square

<sup>a</sup> Fisher’s exact test

<sup>b</sup> Significant

**Table 4** Regression model for factors affecting having vaginismus among the studied groups

Factors	B	SE	p value	Odds ratio (95% CI)
Partner below university education	4.61	1.68	<b>0.006<sup>a</sup></b>	100.01 (3.69–2708.73)
Toronto Alexithymia (possible alexithymia or alexithymia)	3.84	1.35	<b>0.004<sup>a</sup></b>	46.46 (3.30–654.55)
SCID-2 specific personality traits ≥ 2	3.62	1.18	<b>0.002<sup>a</sup></b>	37.28 (3.69–376.85)
SCID-1 abnormalities ≥ 1	1.65	0.95	0.081	5.20 (0.82–33.18)
Constant	– 3.19	1.030	<b>0.001<sup>a</sup></b>	

β regression coefficient, SE standard error, CI confidence interval

<sup>a</sup> Significant

higher education and employment rates. These results have been supported previously in literature being one of associations with vaginismus [19]. Meanwhile, Möller et al. supported that higher levels of education were associated with vaginismus [20]. The rationale was that education does not guarantee a proper sexual knowledge [21].

Meanwhile, having a partner of below university education ( $P = 0.006$ ) was significantly more frequent among cases and it was found to be an independent risk factor for the disorder by regression model. This result is supported by Akhavan-Taghavi et al. who found that 42% of the spouses cases where having undergraduate education [19].



Regarding FGM, the current study found that 25% of the entire sample underwent FGM despite that the majority had a relatively high educational level. This was much lower than Younis et al. who found that 66.5% of the Egyptian women in the sample were exposed to FGM. It reflects the fact that FGM is still prevalent among the Egyptian culture till now [22].

The study also shows no significant relation between FGM and vaginismus. This goes with other case series in Arab-Muslim cultures [23]. Despite the theoretical explanation being conditioned painful traumatic experience to the genital area, it is considered due to being a part of the social norms of the Egyptian society which makes the condition more or less normalized within the Egyptian culture rather than being a traumatizing one.

As for alexithymia, cases were significantly showing more alexithymia than controls ( $P < 0.001$ ) and it was found to be an independent risk factor for the disorder by regression model. This is supported by Ciocca et al. who found that women suffering from vaginismus have 3.8 higher probability of having alexithymia than healthy women. The association between vaginismus and alexithymia was found through difficulty in identifying and expressing feelings and also externally oriented thinking [24].

Regarding the psychiatric comorbidities, some of the disorders were subdivided into current and past disorders. This classification helped in determining whether the psychiatric disorder preceded vaginismus (i.e., past disorder) or the disorder happened with or after the appearance of it (i.e., current disorder).

However, there was no statistically significant difference between both cases and controls in any of the tested disorders individually. But, the presence of more than one disorder was yet statistically more frequent among cases than controls ( $P = 0.032$ ). Yet by regression model, the estimated presence of more than one disorder was about to be significant (yet still not) as an independent risk factor.

These results are supported by different studies that all found the commonality of anxiety and/or depressive disorders among vaginismus patients than control groups [25–27].

Moreover, Watts and Nettle found that anxiety in vaginismus patients is not only related to penetration. However, they are generally elevated and they predicted sharing common predisposing factors between both [28]. The current study also supports this hypothesis due to the presence of both current and previous depressive and anxiety disorders. However, it was not able to explain the nature of the relationship between both.

This is because the nature of all of these studies (including the current study) is more towards

case-control studies hinders the prediction of the cause-effect relationship. Further studies of different nature are still needed to prove the impact of these psychiatric disorders on the development of vaginismus and vice versa.

The current study was not able to identify different psychotic disorders (e.g., schizophrenia, bipolar mood disorder). Consequently, it was not able to find any association with vaginismus (or dispute it).

As for personality disorders, there are no sufficient studies on the relationship between vaginismus and different personality disorders [29]. Meanwhile, the current study found that borderline personality disorder/traits were significantly more common among cases ( $P = 0.026$  and  $P = 0.001$ ). In general, BPD is associated with sexual dysfunctions [30]. The main reason postulated behind that is the concomitant sexual traumatization and abuse rather than the personality disorder alone [31, 32]. The current study (unfortunately) did not assess previous sexual trauma history.

Moreover, avoidant personality traits were also significantly more common among cases ( $P = 0.045$ ). Based upon the same core factor of fear and avoidance, it was expected that many of cases to be more towards the cluster C personality spectrum mainly avoidant personality traits. This is because fearfulness and avoidance are prominent characteristics of cluster C personality disorder [33].

Finally, there was a variability of associated personality disorders with vaginismus between clusters B and C supports the presence of a personality disorder generally will eventually result into poor interpersonal life due to the strict personality characteristics. This would affect their sexual life resulting into a sexual dysfunction regardless its type [34].

Another conclusion is that vaginismus may be linked to certain personality traits rather than a whole set of personality disorder. During clinical assessment of the patients in the current study it was noticed some traits being more frequently present among cases than controls. Thus, they were tested individually. These traits are rigidity, perfectionism, dramatization, mood swings, and impulsivity.

Dramatization (and specially self-dramatization) is considered a prototypical trait in histrionic personality disorder [35] which has proven to have a significant co-occurrence with vaginismus [36].

Moreover, experiential avoidance of sexual activity is considered an essential factor in sexual dysfunctions [37]. It was found to be more associated with perfectionism and rigidity in obsessive compulsive personality disorder (OCPD) [38].

Also, emotional dysregulation (represented in mood swings) and impulsivity are considered core features of BPD that are stable over time [39].

Based on the previous observations, a new term “vaginismus personality” can be introduced. Where having two or more of these personality traits is significantly present among cases and can be considered an independent risk factor for the development of vaginismus. Finally, a woman who is perfectionist, unwilling to change (rigid), emotionally unstable, impulsive, and tends to perform self-dramatization is more susceptible to develop vaginismus than others.

## Conclusions

Women with vaginismus were having higher levels of alexithymia, more developing anxiety and depressive disorders than controls and they have specific personality characteristics.

## Limitations

Despite exploring the psychiatric comorbidities and personality disorders associated with vaginismus, still the relatively small sample size is considered a limitation for this study. Also, exploring the past history of sexual abuse would be beneficial especially with the high association with BPD. Meanwhile, the study design being a case-control study was not helpful in studying the relationship with vaginismus and neurotic disorders. It would be beneficial too to explore the role of different psychotropic medications used to treat neurotic disorders in the prognosis of vaginismus.

## Abbreviations

DSM-IV-TR: 4th edition of the Diagnostic and Statistical manual of Mental Disorders (text revised); DSM-5: 5th edition of the Diagnostic and Statistical manual of Mental Disorders; FGM: Female genital mutilation; TAS-20: Toronto Alexithymia Scale 20; SCID-1: Structured Clinical Interview for DSM-IV; SCID-2: Structured Clinical Interview for DSM-IV personality disorders; BPD: Borderline personality disorder.

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Not applicable

## Authors' contributions

AS and MF hypothesized the concept for the research and supervised the final analysis of the results obtained. HA and HE supervised the data analysis and supervised writing the manuscript. LA made the data collection and supervised writing the manuscript. OM made the data collection, interpreted the analyzed and was a major contributor in writing the manuscript. All authors read and approved the final manuscript.

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## Availability of data and materials

All data generated or analyzed during this study are included in this published article.

## Declarations

### Ethics approval and consent to participate

All procedures were reviewed and approved by the Ethical Committee of Faculty of Medicine, Ain Shams University (FWA: 00017585). Also, a written informed consent was obtained from all participants involved in the study. The consent also included publishing the results of the study with keeping the anonymity of both cases and controls.

### Consent for publication

The participants gave consent for using their data in publication.

### Competing interests

The authors declare that they have no competing interests.

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