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Original article

Female circumcision can negatively affects female sexual function and psychological health

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Abstract:

Background: Female genital mutilation/cutting (FGM/C) is any procedures that cause injury to the female external genitalia without medical causes. The existing literature is contradictory regarding effects of FGM/C on sexual functions. **Objectives:** to identify the differences between circumcised and non-circumcised females in sexual function, psychological health and female genital hormones. **Methods:** This was a case control study performed on 115 females divided into 2 groups; group (A) including 21 females not exposed to FGM and group (B) including 94 females exposed to any type of FGM. All the participants were subjected to full history taking and laboratory assessment of FSH, LH, prolactin, Estradiol (E2), free and

total testosterone levels. Sexual functions were assessed using the Female Sexual Function Index (FSFI) questionnaire and psychological health effects were assessed using the Depression, Anxiety, Stress Scale (DASS-21) questionnaire. **Results:** 94 (81.7%) of females were circumcised and the rest 21 (18.3%) non circumcised. From the circumcised females; 81 (86.2%) were of type 1 and the remaining 13 (13.5%) were of type 2. The total FSFI score was significantly lower in circumcised females (25.16±2.93) compared to non-circumcised females (28.10±2.98). The majority of females with circumcision suffered from moderate stress (50%), moderate anxiety (37.2%) and mild depression (34.2%). There was no effect of FGM/C on hormonal profile. **Conclusions:** FGM/C is associated with reduced sexual functions as well as significant reduction in desire, arousal and satisfaction domains. Depression, anxiety and stress were higher in circumcised females; however the difference was non-significant.

1. Background:

Yearly 230 million female infants or girls nearly were violated by Female genital Mutilation. “FGM” along many countries and contents mainly Africa, Asia, and Middle East [(1)] and to lesser extent in Europe, as in Italy the risk of FGM is nearly between 15-24% [(2)]. FGM is defined as any harm or partial to total removal of any part of female genital organ/s as in type 1 removal of clitoris, type 2 clitoral organ with or without labia minora and majora; while the more sever type 3 involve narrowing to part of vaginal opening in addition to what’s happened in type 2 [(1)]

FGM is not a safe procedure and will not be forever safely even if it’s done by medical or paramedical personnel because it carries immediate or later dangerous health consequences**.** All females have the right to be healthy, not violated, not exposed to fighting or frightened and FMG take off these rights from females [(3)]. For this, legislative aspects were needed. Along 18 from 29 African countries have approved national law against FGM [(4)], indeed 14

countries adopted laws against all female's discrimination or harms [5]. No Asian countries banned FGM, but Indonesia encourage prohibiting FGM [6].

The health effects of FGM involve immediate health risks, which are pain, fever, infection, bleeding, genital injuries, genital swelling, genitourinary problems, shock up to death [7, 8], and long-term end results involve vaginal and urinary problems as infection, discharge and itching, keloid and scar tissues, gynecological and obstetric problems like menstrual pain especially in type 3 and child birth problems: bleeding, difficult labor and caesarean section up to death of the mother and her baby who need resuscitation, as well as psychiatric disturbances including post-traumatic stress syndrome, anxiety, depression, panic attacks, restraint of thinking and feeling up to suicidal attempt [9, 10].

The main general goal of the study is to shed the light on dangerous health effects of circumcision. The specific goals are to identify the differences between circumcised and non-circumcised females in sexual function, psychological health and female genital hormones.

2. Patient and Methods:

Study Design and site:

The present study is a cohort study. It will be conducted in women suffered FGM and compared to non FGM women attending the outpatient obstetrics and gynecology clinic at Beni-Suef University hospital starting from January 2023 till completion of the number of cases suggested by sample size.

The study protocol was approved from research ethics committee faculty of Medicine Beni-Suef University. The participant women gave informed consent before the start of the study. The approval number is (FMBSUREC/09072023/Hussein).

Type of study: Case/ control study.

Study population:

A total of 115 women divided into two groups

Group (A): 21 non FGM women

Group (B): 94 women suffered FGM were included in this study

This study was carried on from January 2024 till completion of the number of cases suggested by sample size. Women were selected after fulfilling the following criteria:

Inclusion criteria:

1. Sexually active non-pregnant women aged 18-45 years old.
2. Stable marital status.
3. Females with frequent, regular and unprotected intercourse.

Exclusion criteria:

1. Females with chronic medical problems such as heart disease, hypertension, diabetes.
2. Females with past history of psychological disorders such as depression and anxiety.
3. Females use medications such as antihypertensive, anti-diabetic, anti-psychiatrics.
4. Infertile non-pregnant females.
5. The presence of chronic medical diseases or sexual problems of the partner such as lack of desire, erectile dysfunction and ejaculation disorders.
6. Female with marital conflicts or her partner is living separately.

Methods:

All studied participants will be subjected to the following:

Detailed history taking:

1. Personal history

Full personal history will be taken from all participants including age, residence, occupation, social class, education level, marital status, duration of marriage, number of children, husband age, mode of delivery and special habits of medical importance (smoking, alcohol drinking, substances abuse like cannabis, cocaine and heroin).

2. Present history

Presence of vaginal infections

3. Medical history

Chronic diseases such as hypertension, diabetes and heart diseases or past history of psychiatric disorders such as depression and anxiety

Use of medications as antihypertensive, antidiabetic, anti-psychiatric

4. Sexual History:

The following questions were included in the questionnaire:

- Presence of sexual partner at the current time.
- Frequency of sexual intercourse.
- Presence of any sexual, physical, or physiological problem of the partner.
- Use of any lubricant during sexual intercourse.

5. Laboratory analyses

- Complete blood count, urine analysis, serum electrolyte, urea and creatinine to exclude genito-urinary infection.

Evaluation of female sexual function using Female Sexual Functioning Index (FSFI):

FSFI questionnaire was used to assess the aspects of female sexual activity. It is a validated self-administered questionnaire containing 19 questions divided into 6 domains: Desire, Arousal, Lubrication, Orgasm, Satisfaction and Pain, were used to classify participants with such dysfunction reliably **Rosen et al.** [(11)]. An Arabic translation of FSFI questionnaire was used in this study **Anis et al.** [(12)].

Evaluation of psychological health using Depression, anxiety and stress scale (DASS-21) short form:

DASS-21 contains 21 items and is associated with negative emotions (depression, anxiety and stress) according to ***(Lovibond, 1995)***: [(13)] An Arabic translation of DASS-21 questionnaire was used in this study ***(Taouket al.*** [(14)]

Lab investigations:

Blood sample of 5 ml were obtained randomly in the first visit from included women and stored at-20 **°C** until assayed. Hormones measured were .

3. Results:

The majority of 115 females recruited in this study were circumcised 94 (81.7%) females and the rest 21 (18.3%) non circumcised. From the circumcised females 81 (86.2%) were of type 1 and the remaining 13 (13.5%) type 2. Table 2 and 3 depicted that female sexual function and FSFI were significantly higher in non-circumcised females than circumcised one.

Table (1): Comparison between Female Sexual Function in Circumcised and Non-circumcised.

		Circumcision		No circumcision		P value
		Count	%	Count	%	
Desire	**Yes**	69	73.4%	17	81.0%	0.471
	No	25	26.6%	4	19.0%	
Arousal	**Yes**	69	73.4%	16	76.2%	0.793
	No	25	26.6%	5	23.8%	
Lubrication	**Yes**	64	68.1%	13	61.9%	0.586
	No	30	31.9%	8	38.1%	
Orgasm	**Yes**	42	44.7%	10	47.6%	0.807
	No	52	55.3%	11	52.4%	
Satisfaction	**Yes**	33	35.1%	8	38.1%	0.796
	No	61	64.9%	13	61.9%	
Pain	**Yes**	45	47.9%	10	47.6%	0.983
	No	49	52.1%	11	52.4%	
TOTAL	**Yes**	21	22.3%	6	28.6%	0.574
	No	73	77.7%	15	71.4%	

Table (2): Comparison between Female Sexual Function in Circumcised and Non-circumcised by FSFI

	Circumcision					No circumcision					P value
	Mean	SD	Median	Minimum	Maximum	Mean	SD	Median	Minimum	Maximum	
Desire	3.04	0.71	3.60	2.40	6.00	3.97	0.72	3.60	3.00	6.00	<0.001*
Arousal	3.85	0.79	4.50	1.50	6.60	4.67	0.50	4.50	3.90	6.00	<0.001*
Lubrication	5.02	0.47	5.10	3.90	6.00	5.17	0.57	5.10	4.20	6.00	0.752
Orgasm	4.01	1.47	5.20	1.20	6.00	4.10	1.60	4.80	1.20	6.00	0.253
Satisfaction	4.09	0.78	5.20	2.40	6.00	4.99	0.95	5.20	2.00	6.00	<0.001*
Pain	5.15	0.66	5.60	2.80	6.00	5.20	0.70	5.60	2.80	6.00	0.773
TOTAL	25.16	2.93	29.40	19.60	33.20	28.10	2.98	29.10	20.90	32.50	<0.001*

Table (3): Differentiation of Circumcised and Non-circumcised Females according to their psychological status

		Circumcision		No circumcision		P value
		Count	%	Count	%	
Stress	**Normal**	2	2.1%	1	4.8%	0.742
	Mild	19	20.2%	5	23.8%	
	Moderate	47	50.0%	10	47.6%	
	Severe	26	27.7%	5	23.8%	
Anxiety	**Normal**	9	9.6%	4	19.0%	0.647
	Mild	18	19.1%	2	9.5%	
	Moderate	35	37.2%	9	42.9%	
	Severe	26	27.7%	5	23.8%	
	Ex. Severe	6	6.4%	1	4.8%	
Depression	**Normal**	42	44.7%	10	47.6%	0.653
	Mild	32	34.0%	5	23.8%	
	Moderate	19	20.2%	6	28.6%	
	Severe	1	1.1%	0	0.0%	

Table (4): Differentiation of Circumcised and Non-circumcised Female through DASS-21.

	Circumcision					No circumcision					P
	Mean	**SD**	**Median**	**Minimum**	**Maximum**	**Mean**	**SD**	**Median**	**Minimum**	**Maximum**	**value**
DAS 01	1.71	0.65	2.00	0.00	3.00	1.62	0.67	2.00	0.00	2.00	0.675
DAS 06	1.64	0.76	2.00	0.00	3.00	1.86	0.57	2.00	1.00	3.00	0.261
DAS 08	1.47	0.77	2.00	0.00	3.00	1.24	0.62	1.00	0.00	2.00	0.117
DAS 11	1.64	0.73	2.00	0.00	3.00	1.52	0.60	2.00	0.00	2.00	0.447
DAS 12	1.56	0.87	2.00	0.00	3.00	1.43	0.81	2.00	0.00	3.00	0.430
DAS 14	1.57	0.77	2.00	0.00	3.00	1.62	0.67	2.00	0.00	3.00	0.910
DAS 18	1.67	0.56	2.00	1.00	3.00	1.67	0.66	2.00	1.00	3.00	0.865
Stress	22.53	5.23	22.00	2.00	30.00	21.90	5.16	22.00	10.00	28.00	0.620
DAS 02	0.95	0.86	1.00	0.00	3.00	0.81	0.93	0.00	0.00	2.00	0.490
DAS 04	0.74	0.84	0.00	0.00	2.00	0.62	0.74	0.00	0.00	2.00	0.612
DAS 07	0.56	0.74	0.00	0.00	2.00	0.52	0.81	0.00	0.00	2.00	0.670
DAS 09	1.20	0.77	1.00	0.00	2.00	1.19	0.81	1.00	0.00	2.00	0.975
DAS 15	1.05	0.79	1.00	0.00	2.00	0.95	0.80	1.00	0.00	2.00	0.598
DAS 19	0.77	0.78	1.00	0.00	2.00	0.95	0.86	1.00	0.00	2.00	0.364
DAS 20	0.93	0.74	1.00	0.00	2.00	1.14	0.65	1.00	0.00	2.00	0.209
Anxiety	12.40	4.46	12.00	4.00	20.00	12.38	4.36	14.00	6.00	20.00	0.983
DAS 03	0.90	0.87	1.00	0.00	3.00	1.05	0.86	1.00	0.00	2.00	0.472
DAS 05	0.73	0.78	1.00	0.00	2.00	0.71	0.64	1.00	0.00	2.00	0.922
DAS 10	0.62	0.80	0.00	0.00	2.00	0.67	0.73	1.00	0.00	2.00	0.618
DAS 13	0.47	0.73	0.00	0.00	2.00	0.43	0.51	0.00	0.00	1.00	0.814
DAS 16	0.50	0.68	0.00	0.00	2.00	0.62	0.74	0.00	0.00	2.00	0.479
DAS 17	0.89	0.77	1.00	0.00	2.00	0.76	0.77	1.00	0.00	2.00	0.479
DAS 21	1.10	0.79	1.00	0.00	2.00	0.76	0.70	1.00	0.00	2.00	0.077
Depression	10.43	5.20	10.00	2.00	26.00	10.00	4.47	10.00	4.00	20.00	0.729

Table (5): Significance of Sexual Hormones in Circumcised Female and Non- circumcised

	Circumcision					No circumcision					P
	Mean	**SD**	**Median**	**Minimum**	**Maximum**	**Mean**	**SD**	**Median**	**Minimum**	**Maximum**	**value**
Age	31.89	5.93	32.00	21.00	43.00	33.52	6.49	32.00	23.00	43.00	0.265
Children	2.53	1.33	3.00	0.00	5.00	3.00	1.45	3.00	1.00	5.00	0.180
Vaginal	1.94	1.23	2.00	0.00	5.00	2.43	1.40	3.00	0.00	4.00	0.082
CS	0.60	0.72	0.00	0.00	2.00	0.57	0.51	1.00	0.00	1.00	0.781
LH	9.43	5.25	8.10	1.10	22.80	7.84	3.93	7.60	1.90	17.30	0.299
FSH	8.94	10.62	6.70	1.00	82.90	20.44	35.97	6.40	2.40	136.70	0.688
LH.FSH	1.37	0.65	1.35	0.07	2.96	1.23	0.88	1.14	0.03	2.61	0.534
Prolactin	13.02	1.91	12.90	10.20	21.70	13.50	1.61	13.20	11.50	19.30	0.284
E2	60.48	17.46	60.75	13.40	103.10	66.74	16.47	63.00	44.60	100.40	0.136
F.Test	0.69	0.24	0.79	0.26	1.02	0.63	0.24	0.70	0.17	0.95	0.300
T.Test	7.77	2.78	8.75	2.70	12.30	7.01	3.05	7.60	1.70	12.20	0.270

Table 4,5 showed that although psychological status and ranking is better in non- circumcised females there is no significant differences between circumcised females and non-circumcised

in psychological conditions stress, anxiety, and depression. Also, table 6 clarified no hormonal differences significantly between circumcised and non-circumcised as it involves removal of peripheral part / organ/s of female genital tract.

4. Discussion:

Many people carry out FGM, but traditionally, it is a ceremonial practice that symbolizes the transition into womanhood and gaining recognition as a new member of society. However, people view it as a violation of their human rights. From a sexual medicine standpoint, women who have had FGM generally exhibit a range of gynecological and obstetric impairments, both immediate and long-term. These are characterized by urine retention, genital scarring, infections, bacterial vaginosis, neonatal issues, and monthly difficulties. Deficits in sexual function are also associated with FGM. Women who have had FGM/C have reported a decrease in sexual pleasure, as well as reduced sexual activity and sensitivity. They have also experienced female sexual dysfunctions, such as genito-pelvic pain and penetration, as well as female orgasmic disorders [(15)].

The objective of this research was to assess the impact of female genital mutilation on sexual function, psychological well-being, and hormone levels in the female genital tissues.

We evaluated the female sexual function of the patients in our study using the FSFI. The results showed a great reduction in the overall FSFI score in females who had undergone circumcision (25.16±2.93) compared to females who had not undergone the procedure (28.10±2.98). This suggests that female circumcision increases the risk of sexual dysfunction. Furthermore, the examination of each factor revealed a significantly lower score in terms of desire, arousal, and pleasure among females who underwent Female Genital Mutilation (FGM). Conversely, there were no significant variations measured in lubrication, orgasm, or discomfort.

The meta-analysis by Nzinga et al., [(16)] which showed a significant reduction in the overall FSFI score among women who underwent FGM compared to those who did not, aligned with the results of our study. They claim that FGM may lead to compromised sexual function. Furthermore, Mohamed et al. [(17)] demonstrated that 87.6% of females who underwent FGM also had female sexual dysfunction (FSD). Researchers found a statistically significant correlation between the type of FGM, FSD in all areas, and the average overall score. The specific form of

female genital mutilation showed a correlation with the severity of FSD. The average cumulative FSFI scores for FGM Type 1, 2, and 3 were 22.5, 19.7, and 17.3, respectively. All of these values, being below 26.0, indicate FSD.

Ismail et al. [18] corroborated our results and documented that FSD was present in 83.8% of FGM/C patients, surpassing the prevalence of 64.5% in the control group. A statistically significant difference was seen in the overall FSFI score between the FGM/C group (19.82 ± 7.1) and the control group (23.34 ± 8.1). Each domain in the FSFI score was analyzed differently across various studies. In their research, Ismail et al. [18] observed that the domain scores in the FGM group were notably lower than those in the control group across all categories, including desire, arousal, lubrication, orgasm, contentment, and pain. Esho et al. [19] examined sexual disorders in married women who had suffered FGM in Kenya. They discovered that the scores for lubrication, orgasm, and satisfaction were notably lower in females who had FGM, regardless of whether the cutting occurred before or after marriage. However, there were no significant differences in desire, arousal, or pain.

Anis et al. [12] studied Egyptian women who had FGM and found that the uncut participants had significantly higher levels of desire, arousal, lubrication, orgasm, and satisfaction (4.02 ± 0.78, 4.86 ± 0.72, 4.86 ± 0.75, 4.86 ± 0.68, 5.04 ± 0.71, respectively) than the cut participants (3.37 ± 0.89, 4.13 ¹ 0.71, 4.16 ± 0.84, 4.50 ± 0.79, 4.69 ± 0.92, respectively). The domain of sexual pain showed no statistically significant difference between the two groups.

The knowledge that sexuality is a complex phenomenon with biological, social, interpersonal, and cultural dimensions may explain the considerable variation in research, despite the widespread use of the FSFI to evaluate female sexual function. Girls and women living in communities that encourage or carry out FGM cannot control many of these problems. It becomes evident that in many instances, individuals do not make decisions about their sexual orientation, marital status, or choice of partners. Families make these choices, which in turn shape their sexual orientation, standard of living, and societal position as women [20].

This research evaluated the psychological effects of FGM on females using the DASS-21. Interpretation of the findings indicated that most females who had circumcision experienced considerable stress (50%), moderate anxiety (37.2%), and mild sadness (34.2%). However, upon comparing females who had undergone

FGM with those who had not, it became evident that non-circumcised females exhibited higher levels of stress, anxiety, and depression ratings compared to their circumcised counterparts. However, these differences were not statistically significant.

Obaid et al. [21] conducted research that documented similar findings, examining the psychological and sexual consequences of female genital cutting in Egyptian girls. The study revealed a greater anxiety Hamilton score in females who had undergone FGM (103.63) compared to females who had not (86.41). Additionally, girls with FGM had a greater Depression Beck Score (101.5) than females without FGM (98.52). Nevertheless, the disparity was not statistically significant.

Hamad et al. [22] evaluated the psychological and sexual dimensions of FGM among Kurdish women. Consistent with our research, they found that circumcised women had a higher average depression score (12.19 ± 5.6) than non-circumcised women (10.68 ± 5.3). Among circumcised women, the average anxiety score was 8.07 ± 4.24, which was somewhat more than the average anxiety score for non-circumcised women (7.44 ± 4.22). Among circumcised women, the average stress score was 14.88 ± 7.03, whereas for non-circumcised women it was 13.54 ± 6.98.

Piroozi et al. [23] conducted an investigation that yielded similar findings. They reported that the average mental health scores in the FGM/C and control groups were 29.12 (standard deviation 12.23) and 26.16 (standard deviation 12.49), respectively, suggesting slight signs of diminished mental well-being in both groups. Furthermore, the average depression ratings in the FGM/C and control groups were 6.12 (standard deviation 4.45) and 4.60 (standard deviation 4.46), respectively, suggesting a statistically significant difference between the groups (P-value 0.008). The statistical analysis revealed a significant difference between the FGM/C group (65.6%) and the control group (52.0%) in terms of the presence of symptoms related to a mental health issue (P-value 0.030). Out of the 80 people in the FGM/C group who reported mental health symptoms, 60% had mild symptoms and 40% had severe symptoms.

Our study participants' hormonal profile revealed no significant changes between circumcised and non-circumcised females in terms of serum FSH, LH, prolactin, E2, free testosterone, and total testosterone. FGM is the surgical destruction of peripheral parts or organs of the female genital system.

Previously, no research indicated any correlation between FGM and hormone imbalances. Their findings primarily linked the illness to local health consequences and psychological issues. Female circumcision, according to Ali et al., [24] is associated with several health issues, including bleeding, infections, urinary disease, dysmenorrhea, and sexual dysfunction; dyspareunia, inability to achieve orgasm, sexual dissatisfaction, and psychological repercussions such as anxiety and post-traumatic stress disorder. Their analysis did not include any recommendations for hormonal problems [24].

5. Conclusions:

FMM/C is linked to decrease sexual functioning, as shown by a notable decrease in the overall FSFI score and a substantial decrease in the areas of desire, arousal, and pleasure. Although circumcised females had greater levels of depression, anxiety, and stress compared to non-circumcised females, the difference between the two groups was not statistically significant. Hormonal profile was unaffected by FGM/C.

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