Prevalence and associated factors of Female Sexual Dysfunction among Female Population in Aksum Town, Tigray Region, Ethiopia, 2019. A Community Based Cross Sectional Study

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Research note

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Abstract

Objective: Female sexual dysfunction is age related, progressive and highly prevalent, affecting more than half of women's in general population. A Community based cross sectional study was implemented from March to April 2019 and a total of 823 participants were interviewed. Data was entered using Epi-data version 3.1 and then exported to SPSS Version 20 for analysis. Bivariate and multivariate logistic regression analysis was carried out to assess the association. The p-value less than 0.05 found from multivariate logistic regression analysis was considered as statistically significant. The strength of the association was presented by odds ratio with 95% C.I and model fitness was checked by Hosmer-Lemeshow goodness and goodness fit was 0.086.

Result: A total of 823 women were completed the questionnaire with mean of Age and in this study the prevalence of Female sexual dysfunction was found to be 57.1%. Factors like old age (AOR= 4.12; 95% C.I: 1.39, 12.22), being divorced (AOR=4.83; 95% C.I: 2.41, 9.66), widowed (AOR=3.28; 95% C.I: 1.58, 6.80), single (AOR=6.24; 95% C.I: 2.22, 17.53), menopause (AOR=2.11; 95% C.I: 1.06, 4.20), pill contraceptive (AOR=0.24; 95% C.I: 0.06, 0.95) were the factors associated with Female sexual dysfunction in the study area.

Introduction

Sexual dysfunction (SD) is termed as an inability to respond to sexual stimulation, or the experience of pain during the sexual act. It can also be defined as a disturbance in the subjective sense of pleasure or desire usually associated with sex, or by the objective performance[1-4]. The psychological and physiological impact of Medical problems such as diabetes mellitus, hypertention and cardiopathies are known to cause sexual dysfunctions. Complications of these chronic illness including neuropathy and vascular insufficiency have been implicated in decreased vaginal lubrication, orgasm dysfunction and decreased libido in women[5-12]. The other important thing is that, there is successful psychological and pharmacological management for female sexual dysfunction, so as to return their social, psychological, physical and reproductive wellbeing. Despite the available treatment, Peoples with sexual problem are rarely to be seen by their doctors, only 3.2% up to 13% are discussed with their doctors. The magnitude of sexual dysfunction in the community varies with different studies and countries. In a community survey of 436 women one over third (33%) of respondents had one operationally defined sexual dysfunction [13-21]. A prospective cohort study from Austria among 703 women shows the incidence of female sexual dysfunction; 22% reported on desire disorder, 35% arousal disorder, 39% orgasmic disorder and 12.8% reported pain disorder. A cross sectional study among 518 Turkish women showed that 48.3% women had reported female sexual dysfunction. Of the women with FSD 48.3% reported desire problem, 35.9% arousal problem, 40.9% lubrication problem, 42.7% orgasm problem, 45% satisfaction problem, and 42.9% pain problems [22-25]. A cross sectional study conducted among 586 Chinese women. The prevalence of FSD was 37.6% and domains showed; low desire in 37.6% of women, a desire disorder in 23.6%, an arousal problem in 25.4%, a lubrication problem in 36.8%, an orgasm problem in 30.6%, and a pain problem in 21.8%. [27] Another cross sectional study from Hong Kong reported that 37.9% of women
had one form of sexual dysfunction [26-28]. A study conducted among 2409 Iranian women showed that 31.5% of participants reported at least one form of sexual dysfunction. The main domain of FSD observed was orgasm disorder (37%), followed by desire disorder (35%), lubrication disorder (33.7%), satisfaction disorder (31.5), arousal disorder (30%), and pain disorder (26.7%) [15]. Another cross sectional study in urban Iran, among 1456 sexually active women, more than 52% of participants had experienced at least one type of sexual difficulty [29]. As per the study conducted in five Egyptian cities, 68.9% of women participants were reported one or more sexual dysfunction. [30]. A cross sectional study from Ghana reported that, the prevalence of female sexual dysfunction was 72.8% [14].

Methods

Study setting

The study was carried out in Aksum Town, Central zone of Tigray regional state of Ethiopia. Currently, Aksum serves as the capital of the central Zone of Tigray regional state. Based on the 2007 national census by the Central Statistical Agency, the town has a total population of 63,979, of whom 30,441 are men and 33,538 women.

Study design and population

This study was done using a Community-based cross-sectional study design from March to April 2019. Women were lived in Aksum Town and who were ages 18 years and above were included in the study and those with physical or mental illness were excluded from the study.

Sample size and sampling technique

The sample size of this study was calculated using a single proportion formula as follow:

\[ n = \left( z_{a/2} \right) ^2 \times \frac{p (1-p)}{d^2} \]

Where

\[ n = \text{number of the study subjects (sample size)} \]

\[ Z = \text{standardized normal distribution value for the 95% confidence level (1.96)} \]

\[ d = \text{Margin of error taken (0.05)} \]
p = 50% since there is no study conducted in the study area. Based on the above assumptions, by using of 2 design effect and 10% non-response, the final sample size becomes 845.

In this study Two Kebeles were randomly selected from the Five Kebeles of Aksum Town. Later, systematic sampling technique was being employed for selection of the participants. Study subjects were selecting every 7 House-holds until the sampled population fills. Selection of the first sample was taken through simple random lottery method.

Operational definition

- **Female sexual dysfunction;** are those women who are found to score <23 from FSFI was considered to have female sexual dysfunction. [31]
- **Physically exercise:** when subjects engaged in moderate activities at least 5 times per week, duration 30 minutes and/or vigorous activities at least 3 times per week, duration 20 minutes.[32]
- **SUBSTANCE USE**
  - **Current use:** using at least one of a specific substance for non-medical purpose within the last three months (alcohol, khat, tobacco, others).
  - **Ever use of substance:** using at least one of any specific substance for non-medical purpose at least once in life time (alcohol, khat, tobacco, others). [33]
  - **Physical illness:** those respondents who were responded having chronic physical illness which was diagnosed before from any private and public health institution.[32]
  - **Social support:** Assessed by Oslo social support scale (OSSS -3) was classified in to three levels.[34]
  - **Menopause:** if women's age is ≥ 40 and lack of menses for 12 straight months in the absence of pregnancy were considered as menopause. [35]
  - **Depression:** Those respondents who are found to score ≥ 10 in PHQ-9 were classified as having depression.[36].
  - **Psychological distress:** assessed by Kessler psychological distress scale(K-10). [37]

- **Kebelles:** Small administrative unit in Ethiopia.

Data collection tools and procedure

A structured, pretested and quantitative interviewer administered questionnaire was adopted by reviewing different literatures. The questionnaire was prepared in English and
then translated into Tigrigna version and then translated back to English for its consistency and completeness.

To maintain data quality, data were collected by Female BSc psychiatric nurses and MSc in Psychiatry supervisors. Both of data collectors and supervisors were trained for two days to ensure the quality of data including clarification of questions to make simple and easily understandable, to use recommended ways of sampling technique and to inform the study subjects based on the consent. Seven female BSc psychiatric nurses were assigned to collect data by face to face interview. Four MSc in Psychiatry supervised the data collector’s and they had been communicated daily with the authors. The questionnaire was tested for its clarity, consistency and unambiguous and appropriate modification had done based on findings. Supervisors and authors were strictly followed the data collection process and filled questionnaire were reviewed daily for completeness and consistency.

**Data processing and analysis procedures**

The data were entered, cleaned and coded using Epi-data version 3.1 and data analysis was done using SPSS version 20. It was described using frequency tables and descriptive statistics. The association between dependent and independent factors was analyzed using binary logistic regression analysis with crude Odds Ratio along with 95% confidence interval, then these factors with P-value < 0.25 analyzed using multivariate logistic regression analysis to determine the associated factors with Female Sexual Dysfunction and to control confounding factors. In multivariate analysis, variables having p-value less than 0.05 and adjusted odds ratio with 95% CI were considered as significantly associated with the outcome variables.

**Results**

**Socio-demographic characteristics of respondents**

In this study; majority of the participants were Tigrean (98.1%), Ethiopian orthodox religion followers (82.7%), and married (73.8%). More than thirty percents of the participants were in the age group of 28-37 (32.7%), about thirty seven percents were unable to read and write, about half of the respondents were house wife, more than half were below poverty line, nearly seventy percents were currently in active menstruation, about half of the respondents had 1-5 children, about sixty percent were not used contraceptive (Table 1).

**Table 1** The socio-demographic status of study participants in Aksum city, Tigray, Ethiopia, 2019.
| Variables         | Category                  | frequency | Percent |
|-------------------|---------------------------|-----------|---------|
| Age               | 18-27                     | 122       | 14.8    |
|                   | 28-37                     | 269       | 32.7    |
|                   | 38-47                     | 156       | 19.0    |
|                   | 48-57                     | 150       | 18.2    |
|                   | >57                       | 126       | 15.3    |
| Ethnicity         | Tigrean                   | 807       | 98.1    |
|                   | Other                     | 16        | 1.9     |
| Religion          | orthodox Christian        | 681       | 82.7    |
|                   | Muslim                    | 127       | 15.4    |
|                   | protestant Christian      | 15        | 1.8     |
| Marital status    | Married                   | 607       | 73.8    |
|                   | Divorced                  | 81        | 9.8     |
|                   | Widowed                   | 102       | 12.4    |
|                   | Single                    | 33        | 4.0     |
| Educational status| unable to read and write  | 306       | 37.2    |
|                   | 1-8                       | 194       | 23.6    |
|                   | 9-12                      | 150       | 18.2    |
|                   | collage and above         | 173       | 21.0    |
| Job               | Government employee       | 132       | 16.0    |
|                   | Merchant                  | 227       | 27.6    |
|                   | House wife                | 420       | 51.0    |
|                   | Other                     | 44        | 5.3     |
| Income            | below poverty line        | 471       | 57.2    |
|                   | above poverty line        | 352       | 42.8    |
| menstrual status  | On Menopause              | 252       | 30.6    |
|                   | On menstrual cycle        | 571       | 69.4    |
| Number of children| None                      | 145       | 17.6    |
|                   | 1-5                       | 425       | 51.6    |
Substance use conditions of respondents

Out of the total study participants, 403 (49.3%) had used substance at least once during their life time and 399 (48.5%) were taking at least one type of substances in the last three months before their study participation.

Psycho-social conditions of study participants

Among study participants, about 44% were reported poor social support, more than 60% of respondents had depression, and 23.5% had severe mental distress (Table 2).

Table 2 psycho-social conditions of study participants in Aksum city, Tigray, Ethiopia, 2019.
| Variables               | Category                      | Frequency | Percent |
|-------------------------|-------------------------------|-----------|---------|
| Level of social support | poor social support           | 362       | 44      |
|                         | moderate social support       | 305       | 37.1    |
|                         | strong social support         | 156       | 18.9    |
| Depression              | no depression                 | 518       | 62.9    |
|                         | Depression                    | 305       | 37.1    |
| Psychological distress  | likely well                   | 494       | 60.0    |
|                         | mild mental disorder          | 69        | 8.4     |
|                         | moderate mental disorder      | 67        | 8.1     |
|                         | severe mental disorder        | 193       | 23.5    |

**Medication related conditions of study participants**

In this study thirty six women were reported history of sexual disorder prior to the current episode, twenty of them were reported medication use. About 37% of respondents thought that psychological support is important for sexual dysfunction.

**Prevalence of sexual dysfunction**

The prevalence of sexual dysfunction among women residents in Aksum city was found to be 57.1% (95% C.I: 53.7, 60.6).

**Factors associated with female sexual dysfunction**

After the bivariate logistic regression, multivariate logistic regression was employed to identify the independent predictors of sexual function in female. Accordingly, older age (AOR=4.12; 95% C.I:1.39, 12.22), being divorced (AOR=4.83; 95% C.I: 2.41, 9.66), widowed (AOR=3.28; 95% C.I:1.58, 6.80), single (AOR=6.24; 95% C.I: 2.22, 17.53), menopause (AOR=2.11; 95% C.I:1.06,4.20), pill contraceptive use (AOR=0.24; 95% C.I: 0.06, 0.95), and depression (AOR=2.57; 95% C.I: 1.58, 4.20) were found to be significantly associated with female sexual dysfunction(Table 3).

**Table 3**: bivariate and multivariate logistic regression analysis of factors associated with female sexual dysfunctions, among women respondents of Aksum city, Tigray, Ethiopia, 2019.
| Variable                      | Category         | Sexual dysfunction | COR       | AOR       |
|------------------------------|------------------|--------------------|-----------|-----------|
|                              |                  | No | Yes |                  |           |           |
| Age                          | 18-27            | 63 | 59 | 1               | 1         | 1         |
|                              | 28-37            | 173 | 96 | 0.59(0.38,0.91) | 0.88(0.50,1.55) |
|                              | 38-47            | 65 | 91 | 1.49(0.93,2.41) | 1.58(0.82,3.03) |
|                              | 48-57            | 41 | 109 | 2.84(1.71,4.70) | 1.29(0.55,3.01) |
|                              | >57              | 11 | 115 | 11.16(5.47,22.78) | 4.12(1.39,12.22) |
| Marital status               | Married          | 322 | 286 | 1 | 1 |
|                              | Divorced         | 13 | 69 | 5.98(3.23,11.04) | 4.83(2.41,9.66) *** |
|                              | Widowed          | 11 | 89 | 9.11(4.77,17.38) | 3.28(1.58,6.80)* |
|                              | Single           | 7  | 26 | 4.18(1.79,9.78) | 6.24(2.22,17.53)* |
| Number of children           | None             | 74 | 71 | 0.37(0.21,0.65) | 0.49(0.23,1.05) |
|                              | 1-5              | 196 | 229 | 0.45(0.27,0.74) | 0.80(0.42,1.50) |
|                              | 6-10             | 58 | 105 | 0.70(0.40,1.22) | 0.71(0.35,1.44) |
|                              | >10              | 25 | 65 | 1 | 1 |
| Educational status           | Can’t read and write | 120 | 186 | 1.30(0.89,1.90) | 0.58(0.33,1.03) |
|                              | 1-8              | 77 | 117 | 1.28(0.84,1.93) | 0.98(0.55,1.73) |
|                              | 9-12             | 77 | 73 | 0.80(0.51,1.23) | 0.84(0.48,1.48) |
|                              | Collage and above | 79 | 94 | 1 | 1 |
| Menstrual status             | Menopause+       | 42 | 210 | 5.98(4.13,8.66) | 2.11(1.06,4.20)* |
|                              | Menstrual+       | 311 | 260 | 1 | 1 |
| Job of respondents           | Government employee | 60 | 72 | 1 | 1 |
|                              | Merchant         | 101 | 126 | 1.04(0.67,1.60) | 1.14(0.64,2.03) |

*Significant at the .05 level
**Significant at the .01 level
| Category                  | Subcategory | Count | Referential Count | Odds Ratio (95% CI) | p-Value  |
|---------------------------|-------------|-------|-------------------|---------------------|----------|
| House wife                |             |       |                   |                     |          |
| Other                     |             | 13    | 31                | 1.98(0.95, 4.13)    | 1.68(0.66, 4.32) |
| Chronic medical illness   | No          | 307   | 312               | 1                   | 1        |
| DM                        |             | 23    | 86                | 3.68(2.26, 5.98)    | 1.46(0.77, 2.75) |
| CHD                       |             | 4     | 20                | 4.92(1.66, 14.56)   | 2.70(0.75, 9.81) |
| Hypertension              |             | 15    | 42                | 2.75(1.50, 5.07)    | 1.43(0.69, 2.96) |
| Other                     |             | 4     | 10                | 2.46(0.76, 7.93)    | 2.14(0.50, 9.18) |
| Contraceptive use         | No          | 157   | 344               | 1.37(0.44, 4.25)    | 0.71(0.21, 2.43) |
| Pill                      |             | 34    | 17                | .31(0.09, 1.10)     | **0.24(0.06, 0.95)** |
| Depo                      |             | 90    | 56                | .39(0.12, 1.25)     | 0.38(0.11, 1.33) |
| Implant                   |             | 67    | 45                | .42(0.13, 1.36)     | 0.39(0.11, 1.37) |
| IUD                       |             | 5     | 8                 | 1                   | 1        |
| Current use of chat       | No          | 343   | 466               | 1                   | 1        |
| Yes                       |             | 10    | 4                 | 3.81(2.5, 5.80)     | .46(0.12, 1.83) |
| Level of social support   | poor social support | 152 | 210 | 0.86(0.59, 1.27) | 0.63(0.38, 1.03) |
| moderate social support   |             | 141   | 164               | .73(0.49, 1.08)     | 0.79(0.49, 1.28) |
| strong social support     |             | 60    | 96                | 1                   | 1        |
| Depression status         | No          | 270   | 248               | 1                   | 1        |
| Yes                       |             | 83    | 222               | 2.91(2.15, 3.95)    | **2.57(1.58, 4.20)** |
| Psychological distress    | likely well | 237   | 257               | 1                   | 1        |
| mild mental disorder      |             | 33    | 36                | 1.01(0.61, 1.67)    | 0.67(0.35, 1.27) |
| moderate mental disorder  |             | 29    | 38                | 1.21(0.72, 2.02)    | 0.50(0.24, 1.04) |
| severe mental             |             | 54    | 139               | 2.37(1.65, 3.40)    | 0.93(0.53, 1.63) |
Discussion

The prevalence of sexual dysfunction among women participated in this study was found to be 57.1%. The magnitude of prevalence in this study was higher than studies found in Brazil (49%) [24], Korea (43.1%) [26], and Iran (52%) [29]. This discordance might be attributed to the difference in survey (internet survey was used in the Korea), difference in socio-economical status, and sample size of these study populations. However, the prevalence of this study was lower than studies found in Egypt (68.9%) [30], and Ghana (72.8) [14]. This variation may be due to the study in Egypt was covered large study areas(conducted in more than five Egyptian cities), socio-cultural difference and/or the difference in sample size .

In this study advanced age was significantly associated with FSD. The result was supported by studies conducted in Brazil and Hong-kong [24, 28]. This may be due to the fact that as age goes increases a number of change in sexual, hormonal , and physiological function takes place. In addition it may be cofound with number of illness faced as age got increased.

This study showed that being divorced, widowed, and single had a significant association with FSD. The study done in Iran and Tukey supported that divorced women had significantly higher sexual dysfunction [15, 23]. This may be attributed to the social and economical burdens must women faced when they are alone. Hence, the burden is increased among developing countries in which majority of the women is dependent on their husband. The psychological stress associated with being divorced and may be another possible reason.

According to this study menopause women had significantly higher sexual dysfunction as compared with those women in active menstruate. Similar results have been found in Iran [15]. This may be due to the hormonal changes occurred with menopause.

This study indicated that women who had depression were more likely to have SD than women without depression. This result was consistent with a studies done in Colombia and Korea [25, 26]. This may be attributed to the decrease in nor-epinephrine and serotonin associated with depression are also associated with sexual inhibition. The psychological effect of depression may also affect sexual functions of a women. Loss of interest, cardinal symptoms of the illness, may include loss of sexual function.
This study showed that women with pill contraceptive were least likely to have sexual dysfunction. This was consistent with a study found in Iran [29]. The possible reason for this may be the hormonal effects of the contraceptive & cultural & religious difference.

**Conclusions**

This study indicated that the magnitude of sexual dysfunction among women who were participated in this study was found high. Older age, being single, divorced, widowed, menopause, and having depression were association with FSD. So women especially those who are with advanced age, single divorced, widowed, menopause, and depressed should have carefully evaluate for sexual dysfunction.

**Limitations Of The Study**

The cross-sectional nature of the study makes it difficult to determine the direction of causality, therefore, further analytical study is needed to understand the direct causal relationships of variables.

**Abbreviations**

BSc ;Bachelor of Sciences  
CHD :Chronic Heart Disease  
C.I : Confidence Interval  
DM :Diabetes Mellitus  
FSD :Female Sexual Dysfunction  
IUD :Intra uterine Device  
MSc :Master of Sciences  
OSSS :Oslo social support scale  
SD : Sexual Dysfunction  
SPSS: Statistical Package for Social Science  
VIF :Variance Inflation Factors

**Declarations**

*Ethics approval and consent to participate*
The study was approved by Aksum University, College of Health science, Research Ethics Committee. Permission letter was also obtained from Aksum City health office and was presented to all participants. Written consent was obtained after the potential participants were informed of the study’s objectives and reading the information sheet. Only women who gave consent to participate were included in the study. All participants were also informed that they could withhold or withdraw from participation at any time, without any negative consequences. Interviews were conducted in private that guarantee optimum privacy. Confidentiality and privacy of the study were maintained during data collection, analysis, and reporting.

**Consent for publication**

Not applicable

**Availability of data and materials**

The datasets in which conclusion taken is available in the form of Microsoft Excel. It is available on requesting

**Competing interests**

The authors declare that they have no competing interests.

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**Authors’ contributions**

GG wrote the proposal, participated in data collection, analyzed the data, and drafted the paper. HD, TB, EH, FG and Yk approved the proposal, participated in data analysis and revised subsequent drafts of the paper. All authors read and approved the final manuscript.

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