Original Research Article

Prevalence and pattern of aphrodisiac use among adult population in Sokoto metropolis, northwest Nigeria

ABSTRACT

Aims: To determine the prevalence and pattern of aphrodisiacs use and associated side effects among adult population in Sokoto metropolis, Sokoto state Nigeria.
Study design: A cross sectional study.
Place and Duration of Study: The study was conducted between February and Augist 2021, in Sokoto metropolis, Sokoto state, Nigeria.
Methodology: We sampled 207 adults living in Sokoto metropolis via a multistage sampling technique. Data was collected using semi-structured questionnaire and were analyzed using IBM SPSS version 23.
Results: The mean age of respondents was 35.23 years. The prevalence of aphrodisiacs use among adults in Sokoto metropolis was 138(67.6%) and up to 64(46.2%) of them have used it within the past one month. More than half (53.1%) of the respondents' partners knew they were using aphrodisiacs; 49(66.3%) of their partners are in support of it and 101(73.2%) expressed satisfaction with the sexual performance of the respondents. Up to 61.6% of the aphrodisiacs consumed were local herbs and the major route of administration was oral route. Gender, marital status, level of education and occupational status were significantly associated with the use of aphrodisiacs ($p<0.05$).

Conclusion: Prevalence of aphrodisiacs use is high among men and women in Sokoto metropolis and it is associated with gender, marital and education. Government and health workers at all levels should intensity efforts to educate the masses about the use and associated side effects through the media such as radio, television and the internet, also communication between couples should be encouraged rather than the use of the substances.

Keywords: Prevalence, pattern, aphrodisiacs, adult population, Sokoto

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1. INTRODUCTION

The need to increase sexual arousal, sexual pleasure and sexual potency can be said to be as old as life itself. Men and women have for centuries sought different ways of gaining sexual fulfilment including the use of aphrodisiacs; this quest has been shown to increase rather than decline over the years [1]. An aphrodisiac can be described as any substance that enhances sex drive and or sexual pleasure [1].The name comes from Aphrodite, the Greek goddess of sexuality and love; and substances used are derived from plants, animals or minerals [1]. Aphrodisiacs can be classified according to their mode of actions into three groups namely: substances that increase libido (i.e., sexual desire, arousal), substances that increase sexual potency (i.e., the effectiveness of erection) and substances that increase sexual pleasure [2].
Sexual response in male and female reflects a dynamic balance between excitatory and inhibitory signals of the autonomic nervous system within the external genitalia and throughout the central nervous system (CNS) [3]. The inhibitory signals pass via the sympathetic pathways while the excitatory is via parasympathetic pathways. The mere

sight, thought or genital stimulation of an appealing partner can initiate excitatory signals in the brain that can lead to sexual arousal. Regardless of the source of these signals, proerectile neurotransmitters such as nitric oxide and acetylcholine are released by excitatory nerves in the penis; penile erection is thus, achieved when these neurotransmitters cause the smooth muscles of the penile arteries to relax and fill with blood. Many aphrodisiacs therefore modulate these pathways to either increase sexual arousal or increase sexual potency (effectiveness of erection)[3].

Globally, the use of either the orthodox or non-orthodox form of aphrodisiacs is increasing, especially the herbal type aphrodisiacs. The frequent advertisement of aphrodisiac substances freely on the streets including on print and electronic media has led to a steady rise in their use [4]. It is common to find sex enhancing drugs being sold in markets, bus stations, supermarkets and along the streets. Ironically, most of these drugs sold openly are not registered with the Food and Drugs Authority (FDA) [5]. The World Health Organization (WHO) estimates that in many developed countries, 70% to 80% of the population have used some forms of alternative or complementary medicine including aphrodisiac substances [6].

The use of sex enhancing drugs globally varies from country to country. For instance, in the United States, a study revealed that 4% of undergraduate men use erectile dysfunction medicines for recreational purposes [7], in Buenos Aires, Argentina, a study among young men between 18 and 30 years of age in a public area showed that 21.5% of the men said they used sildenafil at least once in their lives [8]. In Saudi Arabia [9], the use of sex enhancing medication among sexually active adults was found to be 39.9% and in Malaysia, use of traditional medicines for aphrodisiac purpose was found to be 38.26% among the general public in Penang [10]. In Africa, studies have shown high prevalence of aphrodisiac use [5.11]. Ghanaians, especially men, are known to frequently use aphrodisiacs and are not keen on the type as long as it enhances their sexual function [5]; a study conducted in a municipal district of Ghana showed that up to 66.4% of the sampled men use aphrodisiac [11]. Another study in Ghana also reported the prevalence of sexual stimulants use to be 61% [12]. In Nigeria, the use of herbal substances to enhance sexual performance is quite high in many communities. In a study carried out in Calabar, Nigeria, the prevalence of sexual stimulants use was found to be 98% [13] and in Kano State Nigeria, more than half of the respondents (53.9%) in a study have used sexual stimulants [1].

Regarding the pattern of aphrodisiac use among adult population, various forms are reported to be in use in many communities in Nigeria. In a study conducted in Kwara State on the pattern of aphrodisiac drug use among married adults, it was reported that most of the aphrodisiacs used are mainly the oral types (drinks, chewable herb, licks) and ointment to rub the private part to increase sexual energy, flavor and etc [14]. In Kaduna State, Nigeria, not less than 20 varieties of oral forms of herbal preparations were mentioned during interviews in a study. These include; tiger nut (Aya in Hausa language) which is thought to be good for both men and women in improving sexual performance.' Dates mixed with sugarcane watermelon and grapes are also believed to be useful [15]. Moringa seeds, 'Garin Tarmu' (a powdered formulation which tightens the vaginal mucosa) and '*Garda*lli' (herb that looks like small white onions) are believed to increase sexual urge. Some women use 'Tsimi', a herbal drink or brew that is said to be very effective in lubricating the vagina and therefore useful for women that naturally have dry vagina. 'Sabuzu kuma', a red powder drank with yoghurt is believed to drive a man crazy with sexual desire. Some herbal preparations are also mixed with roasted chicken (popularly called 'Kazan mata' in Hausa language); this is specially prepared for newly married couples [15]. Other preparations are known to cause tightness of the vaginal mucosa and are called '*y*an matsi' in Hausa language [15]. Examples of 'Yan matsi' currently in use especially in northern Nigeria include 'ruwan zakarin ayu' (the seminal fluid gotten from the genitals of an aquatic animal called '*A*yu') and 'Bagaruwa' (*Acacia spp*) (an edible fruit that women boil and use for sit bath after delivery, to tighten the vagina) [15].

In many communities, there is a wrong perception that natural substances are safer alternative to orthodox medicines with no side effects. These drugs are also readily accessible even without prescription in the open markets and on the Internet. Consequently, the free access to these drugs to enhance sexual drive has become increasingly popular, more than 300,000 intoxications were reported to poison control centers over the last 20 years [16,17]. Aphrodisiacs have been shown to have a number of effects especially on male sexual pattern [18]. Use of aphrodisiacs, whether the herbal or the orthodox preparations is associated with side effects such as headache, painful sexual intercourse, vaginal discharge, vaginal tightness, prolong painful erection, nausea, vomiting and urinary tract infection [5].

Several factors have been reported to be associated with the use of aphrodisiacs; a study conducted among 352 Ghanaians revealed that the main factors associated with the use of aphrodisiacs are presence of sexual problems, lower educational attainment, number of sexual partners, advertisement, and knowledge of side effects of aphrodisiacs [5]. In Kaduna State Nigeria, the use of aphrodisiacs was shown to be associated with pleasure seeking behavior (46%), competitions amongst co-wives in a polygamous family setting and seeking for vaginal tightness following childbirth or preparation of a woman for marriage after having several sexual intercourses outside of wed luck [15].

Despite the side effects associated with use of aphrodisiacs, it is a common finding especially on the streets of Sokoto metropolis and other major towns in northwest Nigeria to see adults buying various types of aphrodisiac substances from local vendors. Studies conducted on aphrodisiacs especially in the northwest of Nigeria including Sokoto have concentrated mainly on the prevalence of its usage among married women; this study looked at the prevalence, pattern,

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self-reported side effects as well as factors associated with the use of aphrodisiacs among adult population in Sokoto metropolis

1.0 Materials and method

1.1 Study area

The study was conducted in Sokoto metropolis, in the North-western part of Nigeria. Sokoto state has 23 Local Government Area (LGAs) of which 4 are metropolitan (Sokoto North, Sokoto South, Wamakko and Dange-Shuni LGAs). There are 44 political wards in the metropolitan LGAs with each of the LGAs having 11 wards. As at 2021, Sokoto metropolis had a population of 662,000 inhabitants, based on projection from the 2006 general census [19]; its indigenous inhabitants are predominantly Muslims of the Hausa and Fulani ethnic group

2.2 Study design

It was a cross-sectional study.

2.3 Eligibility

All consenting males and females aged 18 years and above were included irrespective their marital status; however, all temporary visitors to the study area were excluded.

2.4 Sample size determination

Using the Cochran formula for determining sample size in descriptive studies [20], ($n=Z^2pq/d^2$), a sample size of 207 was calculated after adjustment for non-response

2.5 Sampling technique

The study participants were selected using multi-stage sampling technique. In stage I, one LGA was selected from the four metropolitan LGAs in the state using simple random sampling by balloting procedure; Sokoto South LGA was selected. This was followed line listing of all the political wards in the selected study LGA. In stage II, one of political ward was selected using simple random sampling using balloting procedure; Gagi ward was selected.

2.6 Data collection

Data were collected using a set of validated structured questionnaire uploaded on Open Data Kit (ODK) software App installed on android devices. The Questionnaire had four sections with a total of 26 items: Section A: Socio-demographic characteristics of the respondents; Section B: Prevalence and pattern of aphrodisiac use by the respondents; Section C: Forms of aphrodisiac used by the respondents and associated factors; Section D: Side effects experienced following aphrodisiac use. The questionnaire was pretested on 20 purposively sampled adults selected from Sokoto North LGA ward; necessary amendments were made thereafter to validate the questionnaire. Five research assistants comprising of 300 level medical students were trained and recruited as research assistants.

2.7 Data analysis

Data from the completed questionnaires were downloaded from the ODK server in Ms Excel format and then exported to IBM SPSS version 20 for analysis. All the 207 questionnaires administered to respondents were retrieved and analyzed giving 100% response rate. Descriptive statistical analysis was done and continuous variables were presented as mean ± standard deviation (SD) while categorical variables were presented as frequencies and percent. Chi-square test was used to test for the existence of association between categorical variables. Level of statistical significance was set at 5% ($p<0.05$).

3. RESULTS AND DISCUSSION

3.1 Results

Those within 15 to 30 years' age group constitute the highest proportion of respondents (44.6%) and majority were males (63.6%). Up to 96.9% of the respondents were Muslims, 82.6% were Hausa tribe and 62.8% were married. The highest educational attainment of most of the respondents is secondary school education (37.1%), 39.3% were business men/women, 9.7% are full term housewives and 46.6% are married in a monogamous setting (table 1).

Table 1: Socio-demographic characteristics of respondents

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Variable	Frequency (n=207)	Percentage (%)
Age group (years)		
15-30	91	44.6
31-45	80	39.2
46-60	25	12.3
Above 60	8	3.9
Sex		
Male	130	63.6
Female	75	36.4
Religion		
Islam	200	96.6
Christianity	7	3.4
Marital status		
Single	59	28.5
Divorced	8	3.9
Widowed	10	4.8
Married	130	62.8
Tribe		
Hausa	171	82.6
Fulani	24	11.6
Yoruba	7	3.8
Igbo	2	1.0
Others	2	1.0
Level of Education		
None	1	0.5
Qur'anic only	45	22.0
Primary	9	4.4
Secondary	76	37.1
Tertiary	74	36.1
Occupational Status		
Full-term housewife	20	9.8
Student	39	19.0
Farmer	10	4.9
Business	81	39.5
Civil Servant	49	23.9
Vocational	6	2.9
Type of family setting (n=148)		
Monogamous	93	62.8
Polygamous	55	37.2

Lifetime prevalence of aphrodisiac use was 67.6% (n=138) while the current prevalence (within the last one month) was 64(46.2%). Majority of respondents who use aphrodisiacs said they only use it occasionally [90(65.3%)] and the major source of the aphrodisiacs was traditional drug sellers [93(67.4%)]. Up to 125(90.2%) of the users said they got the information about aphrodisiacs from their friends, majority [91(65.8%)] have used it only for less than 6 months; more than half said their partners are aware they are using aphrodisiacs and [72(52.2%)] said they would recommend aphrodisiacs to others (table 2).

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Table 2: Prevalence and pattern of aphrodisiac use among the respondents

Variable	Frequency (n=206)	Percent (%)
Have you ever used aphrodisiac before?		
Yes	138	67.6
No	66	32.4
How often		
Always	18	13.0
Very often	30	21.7
Occasionally	90	65.3
Did you use aphrodisiac within the past one month?		
Yes	64	46.2
No	74	53.8
How the aphrodisiac is obtained? (multiple responses considered)		
Doctors' prescription	3	2.2
From chemists	57	41.3
Mobile drug vendors	13	9.4
Traditional drug sellers	93	67.4
Source of information		
Friends	125	90.2
Health facility	2	1.4
Local street sellers	29	20.9
My partner	5	3.6
Duration of using aphrodisiac(months)		
<6	91	65.8
6-12	18	12.7
13-24	24	17.7
>24	5	3.8
Partners' awareness of respondents' use of aphrodisiacs (n=138)		
Yes	74	53.6
No	64	46.4
Partners' support for use of aphrodisiac by respondents (n=74)		
Yes	49	66.3
No	25	33.7
Partners' satisfaction with respondents' sexual performance (n=138)		
Yes	101	73.2
No	37	26.8
Would you recommend aphrodisiacs to others?		
Yes	72	52.2
No	66	47.8

Local herbs were the most common types of aphrodisiacs used by the respondents followed by tablets/capsules. Regarding route of administration, up to 93.5% of the respondents said they administered the aphrodisiacs via the oral route (figure 1).

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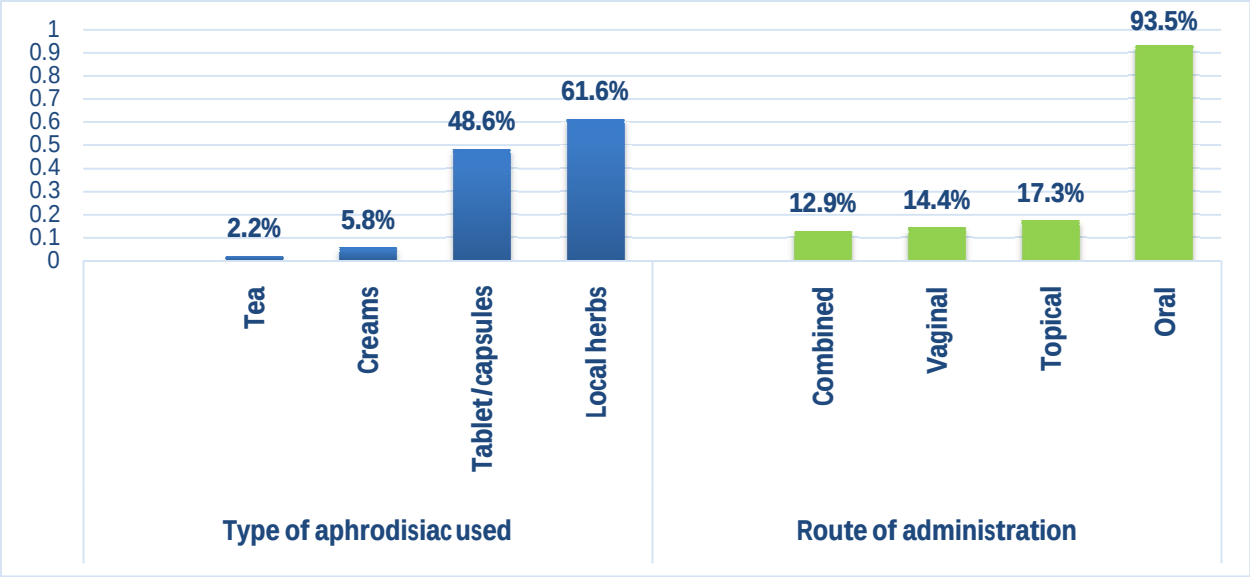

Figure 1: Types and routes of administration of aphrodisiacs used by respondents (multiple responses considered)

Up to 81.9% of the respondents said they use aphrodisiacs to derive sexual satisfaction, 64.5% said they use it in order to satisfy their partners; only 2.9% said it was for medical reason. Among the various reasons given by respondents for their choice of aphrodisiacs, the most mentioned reason was that it gives them more urge for sexual intercourse (67.4%); 47.8% said it was because of the availability of the drugs (table 3).

Table 3: Respondents' reasons for using aphrodisiacs

Variable	Frequency (n=138)	Percentage (%)
Reasons for use of aphrodisiac		
For sexual satisfaction	113	81.9
To keep my partner to myself	40	30.0
To satisfy my partner	89	64.5
For marital harmony	44	31.9
To increase my partner's love	36	26.1
Medical reason	4	2.9
Others	3	2.2
Reasons for choice of aphrodisiac		
Less side effects	52	37.7
Give more urge for sex	93	67.4
Cheaper	56	40.6
Availability	66	47.8

*Multiple responses considered

About half (49.3%) of the respondents said they experienced some side effects following their use of aphrodisiacs and the most common side effect experienced was headache (82.4%). Other side effects experienced were body weakness (22.1%), sustained erection (8.8%) and dryness of the vagina (1.5%) [figure 2].

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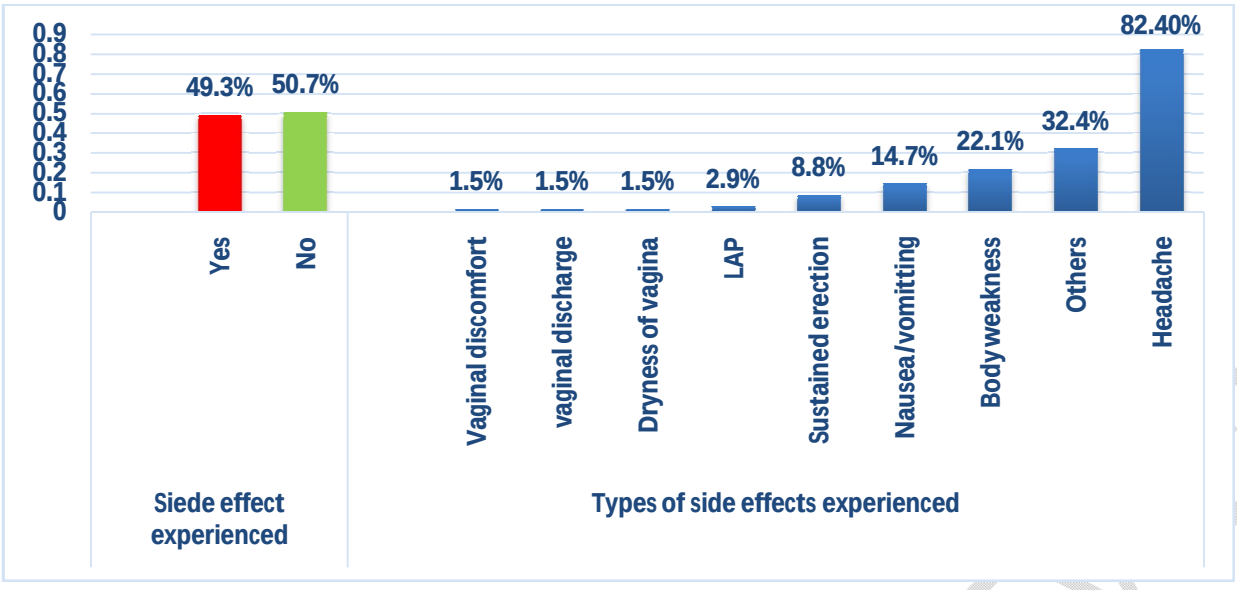

Figure 2: Side effects experienced by respondents following use of aphrodisiacs (multiple responses considered)

In table 4, factors significantly associated with use of aphrodisiacs include sex (p<0.001), marital status (p<0.001), level of education (p<0.009) and occupation (p<0.001). Factors such as age, religion, tribe and type of marriage were not significantly associated with use of aphrodisiacs (p>0.05)

Tables 4: Factors with aphrodisiac use

Variable	Use of Aphrodisiacs Frequency (%)		p-value*
	Yes	No	
Age (years)			
15-30	59(64.8%)	32(35.2%)	
31-45	52(66.7%)	26(33.3%)	
46-60	19(76.0%)	6(24.0%)	
Above 60	6(75%)	2(25%)	P=0.730
Sex			
Male	75(58.1%)	54(41.9%)	
Female	63(84%)	12(16%)	P<0.001
Religion			
Islam	136(68.7%)	62(31.3%)	
Christianity	2(33.3%)	4(66.7%)	P=0.088
Marital status			
Single	25(43.1%)	33(56.9%)	
Divorced	7(87.5%)	1(12.5%)	
Widowed	8(80%)	2(20%)	
Married	98(73.6%)	30(23.4%)	P<0.001
Tribe			
Hausa	116(68.6%)	53(31.4%)	
Fulani	18(75%)	6(25%)	
Yoruba	2(28.6%)	5(71.4%)	
Igbo	1(50%)	1(50%)	
Others	1(50%)	1(50%)	P=0.129
Level of Education			
None	1(100%)		

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Qur'anic only	38(84.4%)	7(15.6%)	
Primary	8(88.9%)	1(11.1%)	
Secondary	49(64.5%)	27(35.5%)	
Tertiary	41(56.9%)	31(43.1%)	P=0.009
Occupational Status			
Full term housewife	19(95%)	1(5%)	
Student	13(34.2%)	25(65.8%)	
Farmer	9(90%)	1(10%)	
Business	58(71.6%)	23(28.4%)	
Civil Servant	33(67.3%)	16(32.7%)	
Vocational	6(100%)		P<0.001
Type of family setting			
Monogamous	68(70.9%)	28(25.1%)	
Polygamous	45(78.9%)	12(21.21%)	P=0.342

*Test statistic: Pearson Chi square; p-value significant at <0.05

3.2 Discussion

In this study, the majority of the respondents were relatively young considering their mean age and the fact that close to half of them were aged between 16-30 years. Studies conducted on the use of sexual stimulants in Sokoto and Kano, Nigeria also made a similar observation regarding the age distribution of the respondents where close to half of the respondents were between the ages of 16-25 years. This finding is not unexpected because according to the Nigeria Demographic and Health Survey (NDHS) 2018, those between the age of 15-29 years constitute close to half of the general population of Nigeria [21]. The possible implication is that a significant proportion of this age group (15-30 years) may be exposed to the use of sexual stimulants for a much longer time given their relatively young age, thus they are more likely to manifest long term side effects of the drugs. Similar study conducted in Ghana on indiscriminate use of sex enhancing products also showed that most of the respondents were aged below 36 years [5]. The fact that this study observed majority of the respondents to be Muslims from Hausa ethnic group could be because Sokoto state is largely dominated by Hausa Muslim communities [21]. In this study more than half of the respondents had attained up to secondary level of education and this is probably because the study was conducted in the metropolis where level of education of the inhabitants expected to be reasonably high. A study conducted in Kano, Nigeria lower proportion of the respondents were observed to have attained up to secondary level of education [22].

In this study, lifetime prevalence of aphrodisiac use was quite high because up to two-third of the respondents have used aphrodisiacs at least once and among them, 46.2% have used it within the past one month prior to this study. Studies conducted in Ghana, Malawi and Nigeria also observed high prevalence aphrodisiacs use among men and women [11,12,22,23]. In all these studies, larger proportion of the respondents were relatively young and this could explain the high prevalence observed in these studies because young adults are likely to be engaged in sexual activities. Majority of the respondents ever used aphrodisiacs in this study said they got the information about the drugs from their friends and this further suggests that peer influence may have a significant association with the use of aphrodisiacs; Lampiao et al., also made similar observation in Malawi where majority of the respondents said aphrodisiacs were introduced to them by their friends [23]. In terms of duration of use of aphrodisiacs by the respondents, about two-third of them said they have only used it for less than 6 months and this may likely be as a result of the relatively young nature of most of the respondents. It is interesting to note that, in this study, more than half of the respondents said their partners were aware they were using aphrodisiacs and a significant proportion of them said they would recommend aphrodisiacs to others. In a study conducted among women by Ango et al in Sokoto, more than two-thirds of the respondents said their husbands were aware and were in support of their use of aphrodisiacs, moreover, up to 83.4% of the women said their husbands reported increased sexual pleasure following their use of aphrodisiacs [24]. These may be responsible for the continued use of aphrodisiacs by the respondents, as their partners are pleased with their sexual performance.

Local herbs were the most common types of aphrodisiacs used by the respondents in this study, followed by tablets/capsules. Several studies have also reported similar observations where herbal preparations happened to be the commonest aphrodisiacs used by respondents [11,15,25]. This finding is not surprising because various types of herbal preparation with aphrodisiac properties are sold freely on the streets at relatively cheap price and without any consultation or prescription. Furthermore, traditional medicine sellers usually advertise and promote their drugs openly on the street and in radio stations, thus people find it much easier to access the herbal types of aphrodisiacs as against the

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conventional types that are sold in chemists/pharmacies in form of tablets/capsules. Incessant consumption of herbal aphrodisiacs may pose a great danger to public health due to the fact that most of the drugs have not been widely researched to know their safety profiles in terms of their optimal dose, toxicities and long term side effects. Regarding route of administration, up to 93.5% of the respondents said they administered the aphrodisiacs via the oral route. This finding is much higher than what was reported in studies conducted in Kano and Sokoto where 50.9% and 51.9% of the respondents respectively said they use the oral route [1,24]. The possible reason for this disparity is probably because in the Kano and Sokoto studies, the study population involved only women, thus a large proportion of them would be expected to use other topical agents that can be applied to the vagina; in this study, up to 63.6% of the respondents were males.

Among the reasons for using aphrodisiacs were the desire of the respondents to satisfy their own sexual needs and that of their partners; only 2.9% use aphrodisiac because of a medical condition. Similar observation was made in a study conducted in Kano State, where close to half of the respondents said they use aphrodisiac substances for better sexual satisfaction and a quarter to gain husband's favors [9]. These findings correlate with the findings of several studies where significant proportion of the respondents said they use sexual stimulants to get husband's favors and prevent marital disharmony [1,22,26]. Women who hawk these substances can always be heard telling their prospective women customers that the use of these substances could make their husbands buy cars, houses and other valuables for them.

The reason for the similarity could be due to the similar cultural setting of the study area (Sokoto and Kano). However, the above findings contradict that of a study carried out in Malawi where 37.2% of the respondents said they were using aphrodisiacs in order to enlarge their penis [23]. A study conducted in Ghana also reported that those with small penis were found to be nine times more likely to use aphrodisiacs [11]. This difference may be attributed to difference in the characteristics of the study population and their socio-cultural background.

This study also found that about half (49.3%) of the respondents have experienced side effects following the use of aphrodisiacs and the most common side effect experienced was headache (82.4%). Other side effects experienced were general body weakness, nausea and vomiting (14.9%), sustained erection (9.0%) and vaginal discharge/dryness (1.5%). As part of their mechanism of action, aphrodisiacs are known to cause dilatation of blood vessels of various parts of the body including brain [27] and this probably explains the high rate of headache experienced by most users of aphrodisiacs.

In this study, sex of respondents was found to be significantly associated with use of aphrodisiacs; higher proportion (84%) of the female respondents were found to be users of aphrodisiacs as against the male respondents (58.5%). The higher prevalence among women could be due to some cultural and religious factors in the study area because polygamy is widely practiced, women may therefore use aphrodisiacs in order to gain more attention of the husband ahead of other co-wives. It has been reported in several studies including this study that a large proportion of people use aphrodisiacs in order to satisfy their partners [1,22,24,26]. A study conducted in Kwara state, Nigeria, however, did not find any association between gender and use of aphrodisiacs; this is probably because the study was conducted among people with sexual dysfunction [14]. Significantly higher proportion of those who were either married or divorced were found to have used aphrodisiacs compared to those who were single. The fact that this study observed significant association between aphrodisiac use and marital status is probably because of the influence of religion and culture in the study area; having sexual intercourse out of wed luck is something that is generally seen to be morally wrong in Sokoto, thus those who are married are more likely to have sexual intercourse than those who are single. This study also found significant association between level of education and use of aphrodisiacs; more than 84% of those with lower educational attainment have used aphrodisiacs, perhaps the higher the educational attainment the less likely the use aphrodisiacs. This relationship is probably because those who are educated are more likely to have access to adequate information about aphrodisiacs, including their adverse effects, thereby becoming discouraged from using it [5,14].

CONCLUSION/RECOMMENDATIONS

Prevalence of aphrodisiacs use is high among men and women in Sokoto metropolis. The most common type of aphrodisiac used by respondents were the local herbs; majority of the aphrodisiacs are administered vis the oral route. Major facyors associated with its use include gender, marital and level of education. Government and health workers at all levels should intensity efforts to educate the masses about the use and associated side effects through the media such as radio, television and the internet.

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Ethical Approval and Consent

Ethical approval for the study was sought from the Ministry of Health of Sokoto state. Further permission to carry out the study was sought from the respective LGA authorities where the study was conducted; written informed consent was sought from each of the participants.

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REFERENCES

1. Abdullahi H, Tukur J. Sexual stimulants and their effect on women of reproductive age in Kano, Northern Nigeria. Department of Obstetrics and Gynaecology Bayero University Kano, Kano state Nigeria. Journal of Basic and Clinical Sciences. 2013; 10(1):13-16.
2. P Sandroni . Aphrodisiacs past and present: a historical review. Clin Auton Res 2001 Oct;11(5):303-7. doi: 10.1007/BF02332975
3. Goldstein I. The central mechanisms of sexual function. Available at https://www.bumc.bu.edu/sexualmedicine/publications/the-central-mechanisms-of-sexula-function. Accessed on 3/09/2022
4. Makwana, S., Solanki, M., Raloti, S., & Dikshit, R. (2013). Evaluation Of Recreational Use Of Aphrodisiac Drugs And Its Consequences : An Online Questionnaire Based Study, 2(1), 51–59.
5. Manortey, S, Mensah PA, & Acheampong GK. Evaluating Factors Associated with the Use of Aphrodisiacs among Adult Male Residents in Ashaiman Municipality, Ghana, Open Access Library Journal, 2018; 5: 1–13. Available at. https://doi.org/10.4236/oalib.1104876
6. WHO. Traditional Medicine Strategy 2002–2005. 2014:12:05.Available: whqlibdoc.who.int/hq/2002/who
7. Harte CB, Meston CM. Recreational Use of Erectile Dysfunction Medications in Undergraduate Men in the United States: Characteristics and Associated Risk Factors. *Arch Sex Behav* 2011; 40**:** 597–606. https://doi.org/10.1007/s10508-010-9619-y
8. Bechara A, Casabé A, De Bonis W , Helien A, Bertolino MV . Recreational Use of Phosphodiesterase Type 5 Inhibitors by Healthy Young Men. The Journal of Sexual Medicine 2010; 7(11): 3736-3742
9. Ahmed A, Alshahrani S, Morgan A, Gabr AH, Abdel-Razik M, Daoud A. Demographics and sexual characteristics of sex-enhancing medication users: Study of a web-based cross-sectional sample of sexually active men. Arab Journal of Urology 2017; 15(4): 366-371
10. Hassali MA, Saleem F, Shafie AA, Al-Qazaz HK, Farooqui M, Aljadhey H, et al. Assessment of general public perceptions toward traditional medicines used for aphrodisiac purpose in state of Penang, Malaysia. Complementary Therapies in Clinical Practice, 2012; 18(4): 257-260. https://doi.org/10.1016/j.ctcp.2012.06.001.
11. Yidana A, Shamsu-Deen Z, Abdul- Manan S. Bio-Psychosocial Determinants of Aphrodisiacs use among men in the Sagnarigu Municipality. International Journal of Health Sciences & Research 2019; 9(12): 133-142
12. Danquah CA, Koffuor GA, Anto BP & Nimako KA. Pelagia Research Library The indiscriminate use of sex enhancing products among Ghanaians: Prevalence, and potential risk. Advances in Applied Science Research, 2011; 2(5): 350–359. Retrieved from http://www.imedpub.com/articles/the- indiscriminate-use- of-sex-enhancing-products-among-ghanaians-prevalence-and-potential-risk.pdf
13. Nna VU, Ofutet EO, Ofem OE, Okpokam DC, Osim EE. The quest for an increased genital size drives sex stimulant abuse among male subjects in Calabar, Cross River State, Nigeria. Asian Pacific Journal of Reproduction 2016; 5(4): 311-316
14. Abdulrazaq Olayinka Oniye, Aminat Adeola Odebode, Shola Abdullahi Ajape. Patterns of aphrodisiac herbs usage as expressed by married adults in Kwara State, Nigeria. Nigerian J. of Guidance and Counselling 2016; 21(1). Available at https://www.ajol.info/index.php/njgc/article/view/152817
15. Mohammed-Durosinlorun, A. (2008) Kayan Mata: The Secret World of Aphrodisiacs in Northern Nigeria. Project Submitted to the ARSRC. Sexuality in Africa Magazine and Monographs, 5, 12-13.
16. Corazza O., Martinotti G., Santacroce R., Chillemi E., Di Giannantonio M., Schifano F., Cellek S. Sexual enhancement products for sale online: Raising awareness of the psychoactive effects of yohimbine, maca, horny goat weed, and ginkgo biloba. *BioMed Res. Int.* 2014;2014:1–13. doi: 10.1155/2014/841798
17. Rao N, Spiller HA, Hodges NL., Chounthirath T, Casavant MJ, Kamboj AK, et al. An Increase in Dietary Supplement Exposures Reported to US Poison Control Centers. *J. Med. Toxicol.* 2017;13:227–237. doi: 10.1007/s13181-017-0623-7

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18. Pratap SA, & Singh R. Potent Natural Aphrodisiacs For The Management Of Erectile Dysfunction And Male Sexual Debilities, Frontiers in Biosciences 2012 1(4): 167-180
19. https://www.macrotrends.net/cities/22021/sokoto/population
20. Ibrahim, T. Research Methodology and Dissertation writing for the health and allied professionals. Cress Global Links limited, Abuja. 2009
21. National Population Commission (NPC) [Nigeria] and ICF. 2019. *Nigeria Demographic and Health Survey 2018 Key Indicators Report*. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF.
22. Umar LB, Jibrin I. Use of Herbal medicines and aphrodisiac substances amongwomen in Kano State, Nigeria. IOSR Journal of Nursing and Health Science.2015;4(4):41- 50
23. Lampiao F, Miyango S, Simkoza H. Herbal aphrodisiac use among male adolescents and teenagers in a rural area of Blantyre district, Malawi. International Journal of Reproduction, Contraception, Obstetrics and Gynecology Lampiao F et al. Int J Reprod Contracept Obstet Gynecol. 2015 Jun;4(3):581-583
24. Ango U M, Oche MO, Bello MM, Yunusa EU, Umar MT, Adamu A, et al. Sexual Stimulants: Prevalence and Associated Factors Amongst Married Women in Sokoto Metropolis, Sokoto State, Nigeria. Archives of Current Research International 2021; 21(1): 24-33.
25. Bhagavathula AS, Elnor AA, & Shehab A. Pharmacovigilance on sexual enhancing herbal supplements. Saudi Pharmaceutical Journal 2015; 24(1): 115-118. Available at https://doi.org/10.1016/j.jsps.2015.01.018 Accessed 24/09/21
26. Sohil M, Manish S, Sandip R, Ramkumar Devaluation of recreational use of aphrodisiac drugs and its consequences, Int J Res Med. 2013;2(1);51-59
27. Kotta S, Ansari SH, Ali J. Exploring scientifically proven herbal aphrodisiacs Pharmacogn Rev. 2013 Jan-Jun; 7(13): 1–10. doi: 10.4103/0973-7847.112832

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