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Original Research Article

Prevalence and Factors Associated with Intra-Vaginal Tobacco Powder Use among Women in The Gambia

Jaiteh, M.^{1,5}, Awolude, O.A.^{1,2}, Tunkara-Bah, H.³, Jatta, J.W.⁴.

¹Pan African University Life and Earth Sciences Institute (Including Health and Agriculture), University of Ibadan, Ibadan, Nigeria; ²Department of Obstetrics and Gynaecology & Infectious Disease Institute, College of Medicine, University of Ibadan/University College Hospital, PMB 5017, G.P.O. Ibadan, Nigeria; ³Department of Nursing, School of Medicine & Allied Science, University of The Gambia, The Gambia; ⁴Directorate of Health Research, Ministry of Health, The Gambia; ⁵Directorate of Nursing, Ministry of Health, The Gambia.

Abstract

Background: Intra-vaginal tobacco powder, locally known as "Tabaa," is a mixture of powdered tobacco and other substances that women use vaginally for sexual enhancement and other perceived benefits. This issue elicited mixed feelings among Gambians, particularly healthcare professionals. Through a media report, the Ministry of Health warned women to stop the practice due to the potential negative consequences. **Objectives:** This study aimed to determine the prevalence and factors associated with intra-vaginal tobacco powder use among women in The Gambia. The findings will provide baseline information regarding the extent of intra-vaginal tobacco usage and the factors promoting them to enable the Ministry of Health and relevant stakeholders to design strategic interventions to combat the practice. **Methods:** A sequential exploratory mixed (qualitative-quantitative) approach was used. The research was a combination of healthcare facility-based and community-based studies, which was carried out in both rural and urban areas of The Gambia. Thirty (30) purposively selected participants were interviewed for the qualitative study, while the quantitative study recruited 400 women using a multistage sampling method. A structured questionnaire developed from the qualitative results was used to collect the quantitative data. STATA version 18 was used for the data analysis. Chi-square test and multivariate logistic regression analysis were used with a significance level of $p < 0.05$, Adjusted Odds Ratio (aOR) and a 95% confidence interval (CI). **Results:** The qualitative results reveal that sexual enhancement, treating genital infections, hastening labour, lack of knowledge, long-distance marriage and polygamy were commonly cited as factors associated with intra-vaginal tobacco powder use. The main analysis in the quantitative study focused on the subset of 287 women who demonstrated awareness of intra-vaginal tobacco practices. The findings of the study revealed a lifetime prevalence of 23.7% ($n=68$) of intra-vaginal tobacco powder use among Gambian women, with 63.2% currently using it. Most of the women were married and within the age range of 30 to 39 years. Women aged 40 years and above (aOR = 3.20; 95% CI = 1.26–8.13; $p = 0.015$), from Farafenni and satellite villages (aOR = 2.20; 95% CI = 1.17–4.12; $p = 0.014$), had non-formal education (aOR = 2.23; 95% CI 0.64–7.79; $p=0.210$) and expressed perceived benefits (aOR = 16.50; 95% CI 6.10–44.50; $p < 0.001$) have the greatest odds of using intra-vaginal tobacco powder. **Conclusion:** Intra-vaginal tobacco powder use is practised in the Gambia and is highest in rural areas. There is an urgent need for interventions, such as raising awareness to mitigate this practice.

Corresponding Author:

Mr. Musa Jaiteh
Farafenni, North Bank
Region, The Gambia
Phone Number: (+220)
2569991
mjaiteh1993@gmail.com

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INTRODUCTION

Intra-vaginal tobacco is a mixture of powdered tobacco and other substances that women insert vaginally for some perceived benefits.^{1,2} Although a few records reference the use of intra-vaginal tobacco powder, it is considered a form of intra-vaginal practice (IVP) among women in Sub-Saharan Africa (SSA)³ Intra-vaginal tobacco powder is available in a variety of forms and is known by different names in different countries.³ It is locally known as 'Tabaa' in The Gambia and is a combination of powdered tobacco, caustic soda, and other ingredients that women use vaginally, mainly for sexual enhancement.^[1,2]

In Zambia, tobacco powder is popularly called 'Insunko' and is widely used for snuffing, while females also use it for vaginal tightening and warmth during sexual intercourse, thus increasing the sexual pleasure of the male partner.⁴ Media reports have it that intra-vaginal insertion of tobacco powder has become a popular fad in West Africa due to the false claims that it can increase sex drive, tighten the vagina, and make one fertile.⁵ Like other types of IVPs (douching, vaginal sildenafil, and Intra-vaginal cosmetic insertion), they are motivated by perceived benefits such as physical and medical factors, as well as sociocultural factors.⁶⁻¹⁰ Several studies have found that most IVPs expose women to sexually transmitted infections (STIs), cervical and ovarian cancer, and other gynaecological issues.¹¹⁻¹⁵ In addition, tobacco substances are heavy in nicotine, highly addictive and contain various carcinogens.¹⁶

Despite the paucity of scientific evidence on the effects of intra-vaginal tobacco, Nigerian physicians have recently issued a warning to women about the dangers of intra-vaginal tobacco powder use and suggested that the practice could be associated with numerous effects like cancer, problems during birth and the natural flow of menstruation.¹⁷ Women advocacy groups and the Ministry of Health of The Gambia have also suggested that the practice could be linked to gynaecological issues. Intra-vaginal tobacco powder use among Gambian women is of considerable concern. Yet, no relevant documented data was found to measure the extent of its usage, factors associated with it, and its consequences.

This study aimed to investigate the prevalence and factors associated with intra-vaginal tobacco powder use among women in The Gambia. The findings of the study would provide baseline information for future studies. Understanding the factors that promote the usage of intra-vaginal tobacco powder would help health service managers and policymakers to design interventions and policies that will discourage the practice.

MATERIALS AND METHODS

Study Design and Setting

A sequential exploratory mixed study was used to determine the prevalence and factors associated with intra-vaginal tobacco powder insertion among women in The Gambia. The information from the initial qualitative study was used to develop tools for the quantitative study. The study was carried out in two areas of The Gambia: one urban (Banjul) and one rural (Farafenni). The entire study was held from March 2022 to August 2022. The qualitative part was a combination of a community-based and health facility-based survey, and the following facilities were involved: Edward Francis Small Teaching Hospital (EFSTH), Farafenni General Hospital and Farafenni Reproductive, Maternal, Neonatal, Child, and Adolescent Health Centre (RMNCAH). The quantitative study was purely a community-based study.

Study Participants

The qualitative aspect of the study consisted of 30 participants from Farafenni and Banjul who were men, women, community leaders, women group leaders, religious leaders, gender advocates, and health workers such as nurses/midwives, gynaecologist, reproductive health specialists at the ministry of health. Participants who were believed to have information about Intra-vaginal tobacco powder use, aged 18 years and above, and agreed to participate in the study were purposively selected.

The quantitative study included 400 women aged 18 years and above who were residing in Banjul and Farafenni, The Gambia and agreed to participate in the study. The study excluded those who were not residents of the selected sites, were less than 18 years old, and refused to participate in the study.

Sampling, Data Collection and Analysis

A purposive sampling technique was used in the qualitative study. Two Focus Group Discussions (FGDs) and in-depth interviews (IDIs) were used to recruit 30 participants from the two study sites. Face-to-face and WhatsApp IDIs were used to obtain information from healthcare professionals such as nurses, midwives, gynaecologists, community health workers, and women who use intra-vaginal tobacco powder. Fourteen (14) healthcare workers consisting of nurses, midwives, community health nurses and gynaecologists, (6) women who practised intra-vaginal tobacco powder use were interviewed. Thematic content analysis guided the qualitative data analysis.

The quantitative aspect consisted of 400 women from both regions, and the sample size was

calculated using a formula $n = \frac{Zx^2P(1-P)}{d^2}$ adopted from Arya et al. (2012),¹⁸ where n denotes the sample size, Z refers to the statistics (1.96) at 95% confidence interval, d for the precision (5%) and p designates the assumed prevalence (50%). The calculated sample size was 384, adjusted to 400 for a representative sample size.

A multistage sampling technique was used to select a representative sample size (400) in the quantitative study. Two regions (urban and rural) were chosen at random from the six Gambian regions, followed by two districts and then two towns. The number of households was chosen using systematic sampling, while the study participants were chosen using simple random sampling in Banjul and Farafenni. An interviewer-administered structured questionnaire was used to collect the quantitative data. The findings of the qualitative data were used to develop the questionnaire. Some relevant information from other studies^{13,19,20} guided questionnaire formation. The questionnaire reviewed and validated was divided into four sections. The first part captured the information on the socio-demographic variables. The second part was used to determine the prevalence of intra-vaginal tobacco powder use by women, the third part focused on the reasons for usage and the fourth part addressed the perceived benefits. The factors associated with intra-vaginal tobacco powder use were determined by the test of association between independent variables and the outcome variable.

SPSS version 22 was used for the data entry and the file was exported to STATA version 18 for data cleaning and analysis. The chi-square (χ^2) test was used to test the association between intra-vaginal tobacco powder use and the independent variables, with a significance level set at $p < 0.05$. A multivariate logistic regression analysis was done to identify the factors predicting the utilization of intra-vaginal tobacco powder. This analysis utilized the Adjusted Odds Ratio (aOR) with a significance level of $p < 0.05$ and a 95% confidence interval (CI). The following assumptions of logistic regression were applied during the analysis: (1) The dependent (intra-vaginal tobacco use) variable was binary “yes” was coded as 1 and “no” was coded as 0; (2) multicollinearity test was done, and independent variables that were highly correlated with each other were removed. This was measured by a VIF score > 10 , and marriage type, stay with husband/partner and duration husband stays away were all removed due to this assumption (table 5a). This also applies to table 5b, where the duration the husband stays away has a VIF score > 10 , so it was removed; (3) Religion was removed from table 5a because it was a perfect predictor.

Ethical Consideration

The study protocol, consent forms, and participant information materials were reviewed and approved by the University of Ibadan/University College Hospital Ethics Committee (UI/EC/0765). The University of the Gambia Research and Publication Committee and the EFSTH Research and Ethics Committee (EFSTH_REC_2022_036) both conducted further reviews and gave their approval. Additional approval was obtained from the Regional Health Directorate of North Bank Region East, Farafenni RMNCAH Centre, and Farafenni General Hospital.

Written informed consent to participate in the study was sought after the aims and objectives of the study had been thoroughly explained to the participants. The participants were recruited into the study after signing or thumb-printing the Informed Consent form, indicating their willingness to participate. The illiterate participants’ informed consent was translated and explained in local languages with the assistance of a close relative or a caregiver who understood both English and the local language used. They were made to fully understand what the study entails in very simple terms before signing or thumb-printing the consent form. There was no financial reward for participating. The participant’s contact details were not recorded, and they were interviewed individually to ensure privacy and confidentiality.

RESULTS

Socio-demographic Characteristics of the Participants in the Qualitative Study

All 30 participants from the selected regions were included in the analysis. The findings of the study show that most (36.7%; $n=11$) of the respondents were between the age category of 30-39, 63.7% ($n=19$) were females, 70.0 % ($n=20$) attended tertiary education and 36.7% ($n=11$) were Nurses by occupation. Eighty-three per cent of them ($n=24$) were married, 93.3% ($n=28$) were Muslims by religion, and 40% ($n=12$) belonged to the Mandinka tribe.

Factors Promoting Intra-vaginal Tobacco Powder Use in the Qualitative Study

Several sociocultural factors were perceived to be associated with the use of intra-vaginal tobacco powder use among women in The Gambia and the themes developed based on the findings of the qualitative data are presented below:

Perceived Benefits (Physical Factors)

Sexual Enhancement

Sexual enhancement was highly mentioned as a reason why women use intra-vaginal tobacco powder. Intra-vaginal tobacco powder, like other sexual enhancement products, was perceived by respondents to give women sexual pleasure. A male midwife stated that “according to the findings I got from small research I conducted, most of the women explained to me that they have pleasure when they apply intra-vaginal tobacco powder during the nighttime” (Nurse 002, age 48). A gender activist also mentions in a FGD that “Most women use it for sexual satisfaction” (FGD 001, 63 years).

Vaginal Tightening

Some participants stated that older women (multiparous) use intra-vaginal tobacco powder for vaginal tightening to make them feel younger and provide enough sexual satisfaction to their husbands. This was attributed to the perception that women who have given birth many times develop vaginal laxity, having sex less pleasurable to their partners. Such women are said to be using substances that constrict their vaginas to please their husbands. A male OPD nurse disclosed, “the reason that I heard why women use ‘Tabaa’ is to be able to satisfy their husbands during sex. According to them, it makes the sex sweeter, and also it constricts the vagina so that the man can enjoy himself” (Nurse 004, age 29). A participant in a FGD stated, “some use it to tighten their vagina because some people believed that the more tied a woman's vagina is, the more she enjoys the sex that's why many women are using ‘Tabaa’” (FGD 003, 33 years).

Perceived Benefits (Medical Factors)

It is a Medicine.

Some respondents perceived that intra-vaginal tobacco powder is a good medicine for genital infections (STIs and UTIs), infertility and other conditions. A woman disclosed, “I was feeling some abnormalities in my body but since I started using ‘Tabaa’ the abnormalities disappeared” (UIDI 003, 32 years).

Treatment for Genital Infections

Some women are believed to use intra-vaginal tobacco powder to treat STIs such as candidiasis, genital warts, and other genital infections and recommend it to other women. Healthcare

professionals and gender activists, refute this claim, although it remains a strong belief among some women. A woman stated, “my aunt told me that ‘tabaa’ is very effective against candidiasis that was when I started using it” (UIDI 002, 24 years). Another woman stated, “I used to feel certain abnormalities in my body which I couldn't understand, and then I was told by a friend to test ‘Tabaa’ and see since I have tried different medicines, and they couldn't cure it. She mentioned that ‘Tabaa’ has cured many people and advised me to try it to see if it'll resolve my health issue. Since I have started using ‘Tabaa’, those problems disappeared; however, I can't guarantee that what ‘Tabaa’ does to me will be applied to other people because our bodies react differently to substances” (UIDI 001, 30 years).

Treatment for Infertility

A woman stated, “I know a woman who sat for many years without having a child, but she started having children after using ‘Tabaa’” (FGD 008, 28 years).

Fasten the Duration of Labour

The findings suggested that pregnant women, when in labour, apply intra-vaginal tobacco powder with the belief that it helps to shorten the duration of labour. A female midwife stated, “I once assessed a woman at the labour ward and realized that she applied ‘Tabaa’, when asked why she did it, she told me that a woman told her that ‘Tabaa’ fasten labour which was why she applied it” (Nurse 001, 26 years).

Treatment for Bedwetting

Participants expressed that some parents apply intra-vaginal tobacco powder to their kids in order to prevent bedwetting. A women group leader said, “even children are on ‘Tabaa’ now. Some parents believe that ‘Tabaa’ is good for bed wetting; they use it on their children” (FGD 001, 63 years).

Weight Control

It was perceived that some women use intra-vaginal tobacco powder to control weight / reduce belly fat. A participant said, “my friend also told me that ‘Tabaa’ would help to reduce the size of my belly” (UIDI 004, 27 years).

Marital Factors

Long-distance Marriage

The long-distance relationship was greatly viewed as a factor associated with intra-vaginal tobacco powder use among women. Women whose husbands live abroad for a long period without physical

intimacies are at higher risk of using intra-vaginal tobacco powder, according to the findings. It was stated that such women would want to satisfy their sexual urges without being engaged in extramarital affairs with other men, so the only option for them is to use intra-vaginal tobacco powder to gain sexual pleasure. A participant said, “my husband went to America a few months after our marriage, and it has been 2 years now I have not set my eyes on him. I have really struggled to maintain myself because I do not want to have any affairs outside my marriage. A friend of mine introduced ‘Tabaa’ to me that was when I started using it” (UIDI 004, 27 years).

Another woman stated, “I know a lady whose husband lives abroad, she used to insert candle to satisfy herself, but she was later introduced to ‘Tabaa’ and she claims that ‘Tabaa’ is more satisfactory than a man” (FGD 001, 63 years).

Polygamy

The theme ‘polygamy’ came up as a factor since it is thought that many Gambian women in polygamous marriages compete with one another to impress their husbands. Given that intra-vaginal tobacco powder has a vaginal tightening effect; it has been proposed that women in polygamous marriages use it to satisfy their husbands during sex. A male nurse said, “Some women want to become the best in the eyes of their husband than the other wives, and they apply ‘Tabaa’ to make themselves feel young when having sex with their husband” (Nurse 009, 29 years).

Others, on the other hand, asserted that when a woman in a polygamous marriage experiences problems with her husband and feels ignored, she might use intra-vaginal tobacco powder to enhance her sexual arousal while her husband is with his other wives. A woman stated, “I am used to ‘Tabaa’ now, that is why sometimes when my husband is with his other wife I use ‘Tabaa’ to satisfy myself” (UIDI 003, 36 years).

Sociocultural Factors

False Beliefs

The findings suggested that many women use intra-vaginal tobacco powder because of the false claims that the product has medicinal benefits. A participant reported, “and the false beliefs that it can cure vaginal candidiasis is causing women all this trouble” (nurse 004, 29 years).

Religious Belief

In The Gambia, where the majority are Muslims, it is considered to be highly sinful for a woman to have sex outside marriage. Therefore, unmarried women or those in long-distance relationships would prefer

using intra-vaginal tobacco powder for sexual enhancement rather than having unlawful sex. A women group leader said, “because they believe that having sex with men when they’re not married to is sinful, ‘Tabaa’ becomes their secret husbands” (FGD 001, 63 years).

A religious leader in a focus group discussion narrated, “you know fornication is sinful, that is why some women use ‘Tabaa’ to satisfy themselves, but ‘Tabaa’ use is also sinful because it is a drug and it allows women to play with their private parts” (FGD 005, 68 years).

Female Genital Mutilation (FGM)

Shreds of evidence suggest that painful sexual intercourse is one of the long-term effects of FGM.^[21] This was reflected in the study as some respondents believed that the painful sexual intercourse experienced by women who underwent FGM, prevents them from attaining libido when they’re with their husbands. Thus, they use intra-vaginal tobacco powder to gain sexual pleasure. A male midwife stated, “my observation is that many women who have undergone FGM especially type 3 experience painful sexual intercourse which could be a reason why they use ‘tabaa’ to gain sexual pleasure (Nurse 003, 36 years).

Lack of Knowledge of the Effects

Lack of knowledge was highly rated as a factor that contributed to the use of intra-vaginal tobacco powder. Majority of women who use intra-vaginal tobacco powder are unaware of its negative consequences, according to the findings. A midwife stated, “Another factor could also be knowledge deficit because many women who apply intra-vaginal tobacco don’t know the effects” (midwife 004, 48 years).

Peer Influence

The findings suggested that many women are persuaded family members and friends to use intra-vaginal tobacco powder. A woman disclosed, “I had never heard of ‘Tabaa’ but it was recommended to me by a friend before I began to use it” (UIDI 003, 32 years). A community health nurse said, “Some of them are due to peer influence because some of them will tell their friends that if you use ‘Tabaa’ it makes you very active when having sex with your husband” (Nurse 010, 30 years).

Economic Factors

Economic factors emerged as a theme as participants expressed that intra-vaginal tobacco powder use is

rampant because the sellers are generating money from it, and they deceive women into buying the product. A gender activist mentioned, “women who sell ‘Tabaa’ are very wise. They will use different kinds of sweet words to other women only because they gain a lot of money from it” (FGD 004, 38 years).

Table 1: Participants’ Socio-demographic Characteristics (n=400)

Variable	N	(%)
Age in Years		
< 20	25	6.3
20 – 29	131	32.8
30 – 39	135	33.8
40 years or more	109	27.3
Area of residence		
Rural	185	46.3
Urban	215	53.8
Tribe of participants		
Mandinka	149	37.3
Wollof	95	23.8
Fula	87	21.8
Others	69	17.3
Religion		
Islam	384	96.0
Christianity	16	4.0
Education Level		
Primary	55	13.8
Secondary	110	27.5
Tertiary	67	16.8
Non-formal education	168	42
Occupation		
Civil servant	73	18.3
Business	57	14.2
Skilled work	20	5.0
Student	37	9.3
Housewife / Unemployed	213	53.3
Marital status		
Married	264	66.0
Single	105	26.3
Divorce / Widow	31	7.8
Marriage type		
Monogamy	219	54.8
Polygamy	49	12.3
Not Married	132	33.0
Stay with husband or partner		
Yes	220	55.0
No	48	12.0
Not married	132	33.0
Duration husband stays away		
< 1 week /Always around	197	49.3
< 1 month	16	4.0
< 6 months	21	5.3
12 months or more	34	8.5
Not Married	132	33.0
Undergone FGM		
Yes	219	54.8
No	181	45.3

The findings of the study showed that all 400 participants from the selected regions were included in the analysis. The findings of the study show in Table 1 that most (33.8%; n=135) of the respondents were between the age of 30-39 years, 53.8% (n=215) were from the urban area, 37.3% (n=149) belonged to the Mandinka tribe and were Muslims. Forty-two per cent (n=168) of the participants attended non-formal education, and most (53.3%; n = 213) of them were housewives/unemployed. Sixty-six per cent of them (n = 264) were married, out of which 54.8% (n = 219) were in monogamous marriages, 55% (n=220) stayed with their husbands/partner, and 8.5% (n=34)

stated that their husbands stayed away for 12 months or more when they travelled. Only 45.3% (n= 181) of the women did not undergo FGM/C out of the 400 participants.

2: Participants’ Awareness of Intra-vaginal Tobacco Powder Use and their Sources of Information

Variable	N	%
Aware of intra-vaginal tobacco powder (n=400)		
Yes	287	71.8
No	113	28.2
Source of information (n=287)		
Family	143	49.8
Friends	98	34.1
Media	46	16.0

Table 2 showed that most (71.8%; n=287) of the participants were aware of intra-vaginal tobacco powder use, out of which 49.8% (n=143) heard it from family members while only 14% (n=41) heard it from a different source of media outlets. However, 28.2% (n=113) of the participants had never heard of intra-vaginal tobacco powder use among women.

Table 3: Frequency Distribution of Participants According to Intra-Vaginal Tobacco Powder Use

Variable	Frequency n	%
Ever use of intra-vaginal tobacco powder (n=287)		
Yes	68	23.7
No	219	76.3
Last time used intra-vaginal tobacco powder (n=68)		
< 1 week	43	63.2
< 12 months	8	11.8
> 12 months	17	25
Current use of intra-vaginal tobacco powder		
Yes	43	63.2
No	25	36.8
The average number of times used per day		
Once	64	94.1
Twice	4	5.9
The average number of times used per week		
Once	26	38.2
2 – 4 times	33	48.5
5 times or more	9	13.2
Duration of usage		
< 6 months	22	32.4
6- 12 months	8	11.8
> 12 months	31	45.6
Used only once in a lifetime	7	10.3

Among the 287 women who were aware of intra-vaginal tobacco powder use, 23.7% (n= 68) used it at least once in a lifetime. Out of the 68 participants who had ever used intra-vaginal tobacco powder, most of them (63.2%; n=43) used it within the week of the interview, while 36.8% (n=25) reported that they had stopped using it. Most (94.1%; n=64) of the intra-vaginal tobacco powder users said

that they use it once a day, a few (13.2%; n=9) of them use it 5 times or more per week and 45.6% (n=31) used it more than 12 months (Table 3).

Table 4: Participants' Reasons for Using Intra-Vaginal Tobacco Powder (n=68)

Reason	Frequency (n=68)	
	Yes n (%)	No n (%)
Sexual enhancement / Vaginal tightening	25 (36.8)	43 (63.2)
Weight control	6 (8.8)	62 (91.2)
Energizer	9 (13.2)	59 (86.8)
Experimentation	3 (4.4)	65 (95.5)
Treat genital infections	63 (92.6)	5 (7.4)
Bedwetting	4 (5.9)	64 (94.1)
Fasten labour	8 (11.8)	60 (88.2)
Peer influence	19 (27.9)	49 (72.1)
Addiction	21 (30.9)	47 (69.1)
Treat infertility	17 (25.0)	51 (75.0)

Note: Most of the participants gave more than one reason for using intra-vaginal tobacco.

Table 4 showed that the majority (92.6%; n=63) of the 68 participants who had ever used intra-vaginal tobacco powder claimed that it was done so to treat genital infections (STIs, candidiasis, and genital warts). The second highest most frequently cited reason for using intra-vaginal tobacco was for vaginal tightening and/or sexual enhancement (36.8%; n=25). The other reasons for using it include weight control (8.8%, n=6), energizer (13.4%, n=9), peer influence (27.9%, n=19), experimentation (4.4%; n=3), addiction (30.9%; n = 21), treatment for bedwetting (5.9%; n = 4), fasten labour (11.8%; n = 18) and infertility treatment (17%; n = 25). These findings further confirm the findings of the qualitative aspect of this study.

Table 5a presents the results of a χ^2 test and a multivariate logistic regression examining the relationship between women's sociodemographic characteristics and intra-vaginal tobacco powder use (aOR with a significance level of p<0.05 and a 95% CI were used). The results show that there is a statistically significant association between age and intra-vaginal tobacco use (p = 0.001). Women aged 40 and above have an aOR of 3.20 (p = 0.015),

indicating they are 3.20 times more likely to use intra-vaginal tobacco compared to women aged below 30 years, with a 95% CI (1.26 - 8.13). In addition, the area of residence is statistically significantly associated with intra-vaginal tobacco use (p = 0.026). Women resid-

Table 5a: Risk Factors Associated with Intra-vaginal Tobacco Powder Use

Factor	Intra-vaginal Tobacco Use N= 287			χ^2 (p-value)	aOR	P-value	95% CI
	Yes n (%)	No n (%)	Total				
Age in years				13.7825 (0.001) *			
30-39	18 (20.0)	72 (80.0)	90		1.38	0.475	0.57 - 3.29
40 and above	34 (37.0)	58 (63.0)	92		3.20	0.015*	1.26 - 8.13
<30 years	16 (15.2)	89 (84.8)	105		Ref		
				4.9683 (0.026) *			
Residence							
Farafenni	40 (26.7)	95 (70.4)	135		2.20	0.014*	1.17 - 4.12
Banjul	28 (18.4)	124(81.6)	152		Ref		
				8.9423 (0.030) *			
Education							
Primary	6 (16.2)	31 (83.8)	37		1.18	0.825	0.27 - 5.25
Secondary	13 (19.7)	53 (80.3)	66		1.87	0.299	0.57 - 6.11
Non-formal	41 (31.8)	88 (68.2)	129		2.23	0.210	0.64 - 7.79
Tertiary	8 (14.5)	47 (85.5)	55		Ref		
				2.4337 (0.4337)			
Occupation							
Business	10 (5.6)	44 (94.4)	54		0.28	0.036*	0.84 - 0.92
Student	3 (14.3)	18 (85.7)	21		0.78	0.765	0.16 - 3.90
Housewife / unemployed	40 (26.1)	113 (73.9)	153		0.63	0.374	0.23 - 1.73
Civil Servant	15 (25.4)	44 (74.6)	59		Ref		
				7.1495 (0.028)*			
Marital Status							
Married	46 (23.6)	149 (76.4)	195		0.87	0.800	0.30 - 2.53
Divorce/widow	12 (41.4)	17 (58.6)	29		2.42	0.208	0.61 - 9.57
Single	10 (15.9)	53 (84.1)	63		Ref		
				1.0226 (0.796)			
Ethnicity							
Wollof	14 (22.2)	49 (77.8)	63		0.35	0.114	0.09 - 1.29
Fula	19 (26.8)	52 (73.2)	71		1.02	0.958	0.43 - 2.41
Others	9 (19.1)	38 (80.9)	47		0.38	0.141	0.10 - 1.38
Mandinka	26 (24.5)	80 (75.5)	106		Ref		
FGM				0.3458 (0.556)			
Yes	37 (22.4)	128 (77.6)	165		0.39	0.074	0.14 - 1.10
No	31 (25.4)	91 (74.6)	122		Ref		

(*) = significant p-value (p < 0.05) aOR = Adjusted Odds Ratio CI = Confidence Interval

ing in Farafenni (rural area) have an aOR of 2.20 (p = 0.014), meaning they are 2.20 times more likely to use intra-vaginal tobacco compared to those in Banjul (urban), with a 95% CI (1.17 - 4.12). Moreover, there is a statistically significant association between women's education and intra-vaginal tobacco use (p = 0.030). The odds of using intra-vaginal tobacco powder are 2.23 times higher among women who attended non-formal education compared to women who attended tertiary education. However, none of the specific education categories (Primary, Secondary, Non-formal) show significant aOR when compared to the reference category (Tertiary). While there is no overall statistically significant association (p = 0.4337), some specific occupations show significant aOR. Business owners have lower odds of intra-vaginal tobacco use (aOR = 0.28, p = 0.036). Students, housewives/unemployed, and civil servants do not show significant aOR. There is a statistically significant association between marital status and intra-vaginal tobacco use (p = 0.028). Divorced/widowed individuals have an aOR of 2.42 (p = 0.208), indicating a non-significant

trend towards higher tobacco use compared to single individuals. There is no statistically significant overall association ($p = 0.796$) between ethnicity and intra-vaginal tobacco use. None of the specific ethnicities show significant aOR when compared to the reference category (Mandinka). There is no statistically significant association ($p = 0.556$) between FGM and intra-vaginal tobacco use.

Table 5b: Risk Factors Associated with Intra-vaginal Tobacco Powder Use

Factor	Intra-vaginal Tobacco Use N= 217			χ^2 (p-value)	aOR	P-value	95% CI
	Yes n (%)	No n (%)	Total				
Marriage Type				6.5767(0.0037)*			
Polygamy	18	22	40		2.52	0.078	0.90 – 7.06
Not Married	22	40	62		0.69	0.561	0.20 – 2.42
Monogamy	28	87	115		Ref		
Stay with husband/partner				31.3977(0.000)*			
Yes	24	100	124		0.15	0.001*	0.05 – 0.47
No	22	9	31		Ref		
Not married	22	40	40				
Source of info				11.5817(0.003)*			
Family	44	72	116		1.09	0.838	0.47 – 2.54
Friends	24	57	81		Ref		
Media	0	20	20				
Perception				67.5133(0.000)*			
Good Practice	43	16	59		16.50	0.001*	6.10 – 44.50
Bad practice	25	114	139		Ref		
Don't know	0	19	19				
Sexual Enhancement				3.6052 (0.058)			
Yes	53	131	184		1.71	0.368	0.53 – 5.53
No	15	18	33		Ref		
Weight Control				0.4697 (0.493)			
Yes	16	29	45		0.51	0.382	0.11 – 2.31
No	52	120	172		Ref		
Treat genital Infections				6.0631 (0.014) *			
Yes	67	132	119		3.57	0.374	0.22 – 58.73
No	1	17	18		Ref		
Treat bedwetting				3.3245 (0.068)			
Yes	23	33	56		2.64	0.154	0.69 – 10.08
No	45	116	161		Ref		
Fasten labour				0.4536 (0.501)			
Yes	33	65	98		1.44	0.493	0.51 – 4.12
No	35	84	119		Ref		
Peer Influence				0.0549 (0.185)			
Yes	25	48	71		1.46	0.579	0.39 – 5.48
No	45	101	146		Ref		
Treat Infertility				0.0897 (0.297)			
Yes	50	99	149		1.21	0.661	0.52 – 2.80
No	18	50	68		0.65	0.443	0.21 – 2.00

(*) = significant p-value ($p < 0.05$) aOR = Odds Ratio CI = Confidence Interval

In summary, the results indicate that age, residence, education, occupation, and marital status are associated with intra-vaginal tobacco use, with statistically significant associations in some cases. However, ethnicity and FGM do not appear to be significantly associated with intra-vaginal tobacco use in this analysis (Table 5a).

Table 5b presents the results of a χ^2 analysis and aOR for the relationship between various factors and intra-vaginal tobacco use. There is a statistically significant association between marriage type and intra-vaginal tobacco use ($p = 0.0037$). Women in polygamous marriages have an adjusted aOR of 2.52 ($p = 0.078$), indicating a non-significant trend towards higher intra-vaginal tobacco use compared to women in monogamous marriages. There is a highly statistically significant association between

staying with a husband/partner and intra-vaginal tobacco use ($p < 0.001$). Women who stay with their husband/partner have significantly lower odds of tobacco use (aOR = 0.15, $p = 0.001$) compared to those who do not stay with a husband/partner. There is a statistically significant association between the source of information and intra-vaginal tobacco use ($p = 0.003$). However, none of the specific source categories (Family, Friends, Media) show significant aOR compared to the reference category (Friends). The association between women's perception and intra-vaginal tobacco powder use is highly statistically significant ($p < 0.001$). Women with a perception of "Good Practice" have significantly higher odds of 16.50 ($p < 0.001$) for intra-vaginal tobacco use compared to those with a perception of "Bad Practice." Moreover, there is a statistically significant association between treating genital infections and intra-vaginal tobacco use ($p = 0.014$). Women who use intra-vaginal tobacco to treat genital infections have an aOR of 3.57 ($p = 0.374$), indicating a non-significant trend towards higher tobacco use compared to those who do not use it to treat genital infections. However, sexual enhancement ($p = 0.058$), weight control ($p = 0.493$), fastening labour ($p = 0.501$), peer influence ($p = 0.185$), treating bedwetting ($p = 0.068$), and treating infertility ($p = 0.297$) are not statistically significantly associated with intra-vaginal tobacco use.

In summary, the results indicate that marriage type, staying with a husband/partner, source of information, and perception are associated with intra-vaginal tobacco use, with statistically significant associations in some cases. Other factors, such as sexual enhancement, weight control, and infertility treatment, do not show significant associations with intra-vaginal tobacco use in this analysis.

DISCUSSION

The findings of the study revealed a lifetime prevalence of 23.7% of intra-vaginal tobacco powder use among Gambian women, with 63.2% currently using it. It is essential to note that this prevalence may be underestimated due to the clandestine nature of this practice among women. Often, those involved in this behavior are hesitant to admit it openly and may instead claim knowledge of someone who uses it. This hesitancy may be attributed to societal stigma or cultural norms that discourage Gambian women from discussing issues related to their genital health openly. These findings align with a study conducted by Brody et al. in 2021, which similarly identified that many women engage in various intra-vaginal

practices discreetly within their homes, driven by a fear of social stigma.²² Additionally, most of the women who had ever engaged in intravaginal tobacco powder use typically used it once a day and 2-4 times per week. In contrast, a study conducted in Nigeria reported a different pattern, with most women using intra-vaginal products up to twice daily and between 8 to 14 times per week.²⁰ This variance in usage patterns could be attributed to the distinctive properties and effects of intra-vaginal tobacco powder compared to other intra-vaginal products.

The main factors associated with intra-vaginal tobacco powder revealed in the qualitative study are as follows: “sexual enhancement,” “treating genital infections,” “hastening labor,” “weight control,” “religion,” “polygamy,” “long-distance marriage,” “peer influence,” “economic factors,” and “treating infertility and bedwetting.” Among these factors, the most cited motivations for women’s intra-vaginal tobacco powder use are sexual enhancement and treating genital infections. These findings align with those of a systematic review conducted by Rullo et al. in 2018, which found that the primary reasons women engage in intra-vaginal practices are to enhance their sexual experiences and for medicinal purposes.²³ However, the quantitative study results displayed disparities compared to the qualitative aspect. Factors such as age, place of residence, education level, occupation, marital status, involvement in polygamous marriages, staying with a husband/partner, sources of information, individual perceptions, and the treatment of genital infections were found to have statistically significant associations with the use of intra-vaginal tobacco powder in the quantitative study. Because the quantitative results relied on statistical analysis, in contrast to the qualitative findings that were rooted in participants' perceptions of intra-vaginal tobacco powder use, it's evident that discrepancies between the two studies emerged.²⁴

The study revealed that there was a statistically significant association between women’s age and intravaginal tobacco powder use ($p = 0.001$). Women aged 40 and above have an aOR of 3.20 ($p = 0.015$), indicating they are 3.20 times more likely to use intra-vaginal tobacco compared to women aged below 30 years, with a 95% CI (1.26 - 8.13). This could be attributed to the common belief that older women are prone to vaginal laxity, making sexual intercourse less pleasurable to their partners.^[25] In addition, such women (40 years and above) are also more likely to have co-wives. The Gambia Demographic and Health Survey 2019-2020 shows that more than half of women aged 40-45 (53%) and 45-49 (58%) have one or more co-wives, in contrast to women aged 20-25 (18%) and 25-29 (25%).^[26] Polygamy emerged as a factor associated

with intra-intra-vaginal tobacco powder use in both the qualitative and quantitative ($p=0.0037$) study. A male nurse said, “Some women want to become the best in the eyes of their husband than the other wives and they apply ‘Tabaa’ to make themselves feel young when having sex with their husband” (Nurse 009, 29 years). Given that women in polygamous marriages compete with one another to win their husbands' favour or attention and older women are perceived to have vaginal laxity, it is assumed that they (women aged 40 years and above) use intra-vaginal tobacco powder for vaginal tightening to make them feel younger and provide enough sexual satisfaction to their husbands.²⁵

More to this, it is obvious that women in polygamous marriages are often pinned to situations where they miss their husband during the days when he is with his other wives. These women may encounter issues with their husbands in the worst circumstances and feel ignored. Consequently, they turn to the use of intra-vaginal tobacco powder to experience sexual pleasure while their husbands are with the other wives. It is asserted that intra-vaginal tobacco powder can enhance sexual satisfaction for women without requiring physical intimacy. This assertion is corroborated by a statement from a female participant in the qualitative research who expressed, “I am used to ‘Tabaa’ now, that is why sometimes when my husband is with his other wife I use ‘Tabaa’ to satisfy myself” (UIDI 003, 36 years).

The usage of intra-vaginal tobacco powder among women is significantly influenced by their geographical location and level of education. As a relatively compact nation, the Gambia displays a degree of uniformity among its population. Still, a noticeable gap exists in educational attainment between residents of urban and rural areas.²⁶ This difference can be attributed to the uneven distribution of quality educational resources in urban centers, a phenomenon consistent with the study's findings (where most participants hail from rural areas with limited formal education). The research reveals a statistically significant association between both residence and education level and the use of intra-vaginal tobacco powder. Women living in Farafenni (a rural area) are 2.20 times more likely to use intra-vaginal tobacco compared to those in Banjul (an urban area), with a 95% confidence interval of 1.17 to 4.12. Similarly, women with non-formal education have a higher likelihood of using intra-vaginal tobacco powder compared to those who have tertiary education. Women from rural areas with limited access to formal education often face greater vulnerability to harmful traditional practices due to their lack of awareness regarding the negative consequences.²⁷ This contrasts with the findings of Smit et al. (2011),²⁸ which suggested that intra-

vaginal practices were similar among rural and urban populations. A study conducted in the United States titled "Motivations for Intra-vaginal Product Use among a Cohort of Women in Los Angeles" also disagrees with the findings of this study, indicating that most of the participants had attended college, and there was no significant association between education level and intra-vaginal practices.¹⁵ This discrepancy may be attributed to the United States being a more developed country with fewer disparities between rural and urban women.

Whether a woman stays with her husband or not also determines if a woman uses intra-vaginal tobacco powder. Women who stay with their husband/partner have significantly lower odds of tobacco use (aOR = 0.15, $p = 0.001$) compared to those who do not stay with a husband/partner. Moreover, women's usage of intra-vaginal tobacco powder was significantly associated with the length of time their husbands were absent from them. Women asserted that intra-vaginal tobacco powder may satisfy their sexual needs even in the absence of direct physical touch with men. Therefore, women who miss their husbands for a specific amount of time and do not wish to indulge in extramarital affairs utilize intra-vaginal tobacco powder to satiate their sexual needs. A woman said, "my husband went to America a few months after our marriage, and it has been 2 years now I have not set my eyes on him. I have really struggled to maintain myself because I do not want to have any affairs outside my marriage. A friend of mine introduced 'Tabaa' to me that was when I started using it" (UIDI 004, 27 years). This does not correlate with the findings of Smit et al. (2011).²⁸

Furthermore, a key element strongly connected with intra-vaginal practices is women's perceptions.^{12,15} According to the findings of this study, the association between women's perception and intra-vaginal tobacco powder use is highly statistically significant ($p < 0.001$). Women with a perception of "Good Practice" have a significantly higher odds ratio of 16.50 ($p < 0.001$) for intra-vaginal tobacco use compared to those with a perception of "Bad Practice." Perceived medical benefits, such as treating genital infections, are also highly associated with this. Nevertheless, it is crucial to note that the Ministry of Health of The Gambia, together with healthcare professionals, refute the notion that intra-vaginal tobacco powder can effectively treat genital infections, citing a lack of scientific evidence to support such claims.^{2,3} Studies from Zambia and other African countries reported similar findings.^{11,12,13,15,29}

Study Limitations

This study, like any other study, was faced with some limitations during the research process. The research topic was very sensitive, making it challenging to get enough accurate information from some participants. In addition, there is limited data on intra-vaginal tobacco powder use because not many studies were found in the literature searches. Another limitation was that the study did not conduct laboratory investigations to examine the gynaecological effects of intra-vaginal powder.

Strengths of the Study

The use of a sequential exploratory mixed study design was useful in generating sufficient information about intra-vaginal tobacco powder use. Secondly, the qualitative study results were used to develop the questionnaire for the quantitative study. Furthermore, the inclusion of rural and urban areas aided in determining where intra-vaginal tobacco powder use was more prevalent in The Gambia. The study's findings will also serve as a baseline for future research since it is believed to be the first study that examines the prevalence and factors associated with intra-vaginal tobacco powder use among women in The Gambia.

CONCLUSION

The study concluded that intra-vaginal tobacco powder was practised by women in the Gambia and highest in rural areas. Socio-demographic variables were significantly associated with the use of intra-vaginal tobacco powder. The study also showed that women with low levels of education and those with poor perception have the greatest odds of using intra-vaginal tobacco powder. Moreover, intra-vaginal tobacco powder use was more common among women aged 40 years and above. Therefore, awareness creation, including sex education, is the most important intervention to mitigate this practice. A case-control study that includes laboratory investigations should also be conducted among users and non-users of intra-vaginal tobacco powder to determine its negative effects on Gambian women. Further studies across Africa are needed to find out if intra-vaginal tobacco powder is used in other African countries.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

MJ conceived the research idea, designed the study, and collected the data. MJ, HTB, and JWJ analysed the data. OAA and HTB supervised the research. OAA and HTB reviewed the data. MJ, OAA, and HTB conducted the literature review. MJ wrote the first draft of the manuscript. All authors reviewed, revised, and approved the final manuscript.

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