

Smokeless Tobacco Use among Women in Kasama District-Zambia

Gloria Kangwa^{1*}, Caroline Zulu², Kabwe Chitundu³, Jemia Milanzi⁴

¹Lukupa College of Nursing and Midwifery, Kasama, Zambia

²Department of Public Health Nursing, School of Nursing Sciences, University of Zambia, Lusaka, Zambia

³Department of Mental Health and Psychiatric Nursing, School of Nursing Sciences, University of Zambia, Lusaka, Zambia

⁴School of Nursing and Midwifery, Mulungushi University, Kabwe, Zambia

Email: *gloriangoma2013@gmail.com, caroline.zulu482015@gmail.com, kabwe.chitundu@mail.com, aminakabungo@gmail.com

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Abstract

Background: Smokeless tobacco is defined as a product that contains tobacco, is not smoked or burned at the time of use, and commonly consumed orally or nasally. These products can be placed in the mouth, cheek or the lip and are sucked or chewed. The Zambian government, in the 2019 country report, gave an estimated figure of 4.5% of females aged 15 years and above in 2017 used smokeless tobacco and by 31st December, 2018, there was an increase of smokeless tobacco users to 6.8% women of the same age group. This study aimed to explore the extent of smokeless tobacco use among women in Kasama district-Zambia. **Methodology:** An analytical cross-sectional quantitative study design was used to collect data using the modified structured interview schedule, adopted from Medicine for Global Health. Simple random sampling method using rotary technique was used to select 430 respondents after meeting the inclusion criteria. Informed consent to participate in the study was obtained. Data was analysed using version 26.0 of the Statistical Package for Social Sciences. Appropriate parametric or non-parametric statistical tests (Chi-squared or Fisher's exact test) were adopted in testing for associations between variables. Univariable and multivariable binary logistic regression analysis were employed in identifying smokeless tobacco use among women using an investigator-led stepwise approach, guided by various fit statistics and the likelihood ratio test. All statistical analyses adopted a 5% significance level at 95% confidence interval. **Results:** The results showed that most of the respondents were aged between 18 and 25 years (45.6%), (53.7%) lived in urban settlements and the majority (80%) were unemployed. The majority of respondents (83.5%) had a friend/relative who used smokeless tobacco and over half (53.5%) thought smokeless tobacco was beneficial to them. The commonly mentioned benefits of smokeless tobacco included body warmth (13.6%) and vaginal tightening (7.9%). The results revealed that

most of the respondents attained a secondary level of education (38.4%). According to the study, smokeless tobacco use among women of Kasama-Zambia was significantly associated with the following; age ($p < 0.0001$), education level ($p = 0.050$), and monthly income ($p = 0.006$). The results further show that knowledge ($p = 0.003$) and cultural beliefs ($p < 0.0001$) were significantly associated with smokeless tobacco use. In both univariable and multivariable analyses, age and cultural beliefs had an increasing effect on the odds of using smokeless tobacco. Adjusting for other variables, women aged 36 - 45 years (aOR = 3.85, 95% CI = 1.71, 8.68, $p = 0.001$) and those aged over 45 years (aOR = 6.00, 95% CI = 1.95, 18.4, $p = 0.002$) had significantly higher odds of using smokeless tobacco than women aged between 18 and 25 years. Similarly, women with cultural beliefs had 4.49 times higher odds of using smokeless (aOR = 4.49, 95% CI = 2.76, 7.32, $p < 0.0001$) compared to women with no cultural beliefs. **Conclusion:** Based on these findings, the study recommends that efforts should be channeled towards the dissemination of information on the impacts of smokeless tobacco use in order to overcome cultural beliefs attached to smokeless tobacco use.

Keywords

Smokeless Tobacco Use, Knowledge, Educational Level, Cultural Belief

1. Introduction

In many regions of the world, especially in low- and middle-income countries, a considerable proportion of women, including those of reproductive age, chew tobacco or use other tobacco products [1]. Insunko (Smokeless tobacco) and other smokeless tobacco (ST) products are consumed by 356 million people worldwide [2]. According to the World Health Organization, the consumption of insunko has a long history even as early as before Christopher Columbus' voyage to the Americas with natives of South America being the first people known to use it [3].

Male adults generally have higher rates of smokeless tobacco use than females, however, in some countries such as Bangladesh, Thailand, Cambodia, Malaysia, Vietnam, South Africa, Mauritania, Sierra Leone, and Barbados, use among women is similar to or higher than use among men [4]. According to Global Adult Tobacco Survey 2016-17 (GATS-2), 12.8% of women in India consume smokeless tobacco regularly either daily or occasionally [5].

In Zambia, snuff is popularly known as 'Insunko' in Bemba and 'Kaponda' in Nyanja [6]. It is made from pulverized leaves mixed with ashes from corncobs, banana leaves, soda or Marijuana. Among Smokeless Tobacco products, snuff has become popular in a number of developing countries like Zambia, for example, Salloum *et al.* [7], in their study revealed that 70% of women in Zambia use smokeless tobacco and [3], reported an increase of 1.2% as compared to the previous years. This increase in the use is linked to a number of factors such as social, cultural, pharmacology and physical factors, and results into impairment of

attention and working memory.

Most snuff, like other tobacco, contains carcinogenic substances and the addictive substance nicotine. Nicotine affects the brain and the nervous system, as it mimics important neurotransmitters in the body. The nicotine content can vary depending on the type of moist snuff and the manufacturer [3].

Researchers have described the activity of smokeless tobacco consumption among women as an activity that was for men's prestigious status, which is now taking a shift to women. Therefore, this study aims to explore smokeless use and whether the incidences of tobacco product use is becoming common among women in Kasama district.

2. Material and Methods

The study used an analytical cross-sectional quantitative study design and data were collected from 20th February to 20th April, 2023. Participants comprised 430 women of different backgrounds found in the central business town of Kasama District of the Northern Province of Zambia. The sample size was arrived at by using the Cochran formula of prevalence [8].

Purposive sampling was used to select the markets in the Kasama district of Northern Province and a simple random sampling method using a lottery technique was used to select the study participants. Data was collected using the modified structured interview schedule and analysed using Statistical Package of Social Sciences (SPSS) version 26.

2.1. Subjects & Selection Method

Simple random sampling method using the rotary technique was used to select the 430 study participants from the three markets. Each market contributed respondents equally that is 143 participants, these were picked by writing numbers 1 to 150 on small pieces of papers, and those who picked the 10th number became the respondents until the sample target for the day was reached of 15. This was repeated on a daily basis until the sample size was reached.

2.1.1. Inclusion Criteria

The study included women aged 18 years and above available at the target settings who gave consent to participate in the study.

2.1.2. Exclusion Criteria

All females aged below the legal consent age (18 years) were excluded from the study. Traders and shoppers in the target markets who are non-residents of Kasama district were not included in the study. All respondents who did not pick the 10th number using the simple random sampling method using rotary technique were also excluded.

2.2. Procedure Methodology

The researcher started each data collection by introducing herself and participants were then asked to sign the consent form and thereafter given a questionnaire.

2.3. Statistical Analysis

Data was analysed using version 26.0 of the Statistical Package for Social Sciences. Appropriate parametric or non-parametric statistical tests (Chi-squared or Fisher's exact test) were adopted in testing for associations between variables. Univariable and multivariable binary logistic regression analysis were employed in identifying smokeless tobacco use among women using an investigator-led step-wise approach, guided by various fit statistics and the likelihood ratio test. All statistical analyses adopted a 5% significance level at 95% confidence interval.

Ethical Consideration: Since the study involved human subjects, written consent was sought from the study participants. Those who declined to take part in the research were not coerced. To ensure confidentiality and anonymity, the interview schedule did not bear any names so that the information could not be directly linked to a particular individual. In addition, ethical clearance was sought from the University of Zambia Biomedical Research Ethics Committee (UNZABREC) (REF NO.3147-2022) and the National Health Research Authority (NHRA) (REF NO. NHRAR-R-162/16/2003). Further, a formal request was made to the Town Clerk, the Mayor and the markets where research was done to allow us to collect data.

The respondents' decisions were respected and efforts were made to ensure their wellbeing throughout the data collection. In the study, justice was upheld, by ensuring that all respondents are treated equally and given equal opportunity to make individual decisions on whether to participate in the study or not. Respondents were not subjected to any harm as the research did not involve any invasive procedures. Respondents were protected from psychological harm by letting them answer the questions in a natural private setting with no public interference.

4. Results

Results in this chapter are presented using frequencies and percentages. To estimate the prevalence of smokeless tobacco use, the total number of women who reported tobacco use was divided by the total sample size. Other variables of interest were measured and reported as indicated. The study findings are presented using tables and charts and outlined according to the sections and sequence in the data collection tool, that is, socio-demographic characteristics, knowledge of smokeless tobacco, use of smokeless tobacco, and cultural beliefs. Lastly, cross-tabulations between variables and binary logistic regression analysis results were presented.

4.1. Demographic Characteristics

Table 1 shows that most of the respondents fell in the age groups of 18 - 25 years (45.6%) and 26 - 35 years (23.2%). About half, (49.8%) were Bemba, 52.8% were married and Christianity was the commonest religious affiliation (93.7%).

Most of the respondents (53.7%) lived in urban settlements, and the majority (80%) were unemployed. The majority of the respondents (79.1%) reported a monthly income of not more than K5000.

Table 1. Demographic characteristics of the respondents (n = 430).

Variable	Category	Frequency (n)	Percent (%)
Age in years	18 - 25 years	196	45.6
	26 - 35 years	100	23.2
	36 - 45 years	82	19.1
	Over 45 years	52	12.1
Tribe	Bemba	214	49.8
	Mambwe	77	17.9
	Tonga	30	7.0
	Ngoni	31	7.2
	Others	78	18.1
Marital status	Unmarried	227	52.8
	Married	203	47.2
Religion	Islam	9	2.1
	Christianity	403	93.7
	Others	18	4.2
Area of residence	Rural	199	46.3
	Urban	231	53.7
Employment status	Unemployed	344	80.0
	Employed	86	20.0
Monthly income	≤K5000	340	79.1
	>K5000	90	20.9

4.2. Use of Smokeless Tobacco

Table 2 shows that most respondents used smokeless tobacco daily (33%) and between 2 - 4 days (35.1%).

Over a third used smokeless tobacco twice (35.4%) and three (33.4%) times daily. Over half (52.6%) of the respondents first used smokeless tobacco aged between 18 and 25 years and about half (46.1%) had been using smokeless tobacco for over 5 years. Over half (54.5%) of the respondents were trying to cut down on smokeless tobacco use, mainly due to health reasons (40.5%) and experiences of stigma (30.9%).

4.3. Benefits of the Use of Smokeless Tobacco

As shown in **Table 3**, the majority of respondents (83.5%) had a friend/relative who used smokeless tobacco and over half (53.5%) thought smokeless tobacco

was beneficial to them. Commonly mentioned benefits of smokeless tobacco included body warmth (13.6%) and vaginal tightening (7.9%).

Table 2. Use of smokeless tobacco (n = 430).

Variable	Category	Frequency (n)	Percent (%)
Days used ST in the past seven days	Everyday	142	33.0
	2 - 4 days	151	35.1
	5 - 6 days	15	3.5
	Never	122	28.4
Daily frequency of ST use in the past seven days	Once	53	17.2
	Twice	109	35.4
	Three times	103	33.4
	Over three times	43	14.0
Age when first used smokeless tobacco	Under 18 years	59	19.2
	18 - 25 years	162	52.6
	26 - 35 years	60	19.5
	Over 35 years	27	8.8
Length of time been using smokeless tobacco daily	Under a year	81	26.3
	2 - 5 years	85	27.6
	Over 5 years	142	46.1
Currently trying to cut down on the use of smokeless tobacco	Yes	168	54.5
	No	140	45.5
Reason for trying to cut down on smokeless tobacco use	Health reasons	68	40.5
	High cost	3	1.8
	Stigma	52	30.9
	Need to control my life	20	11.9
	Smell and taste	9	5.4
	No particular reason	16	9.5

Table 3. Use of smokeless tobacco (n = 430).

Variable	Category	Frequency (n)	Percent (%)
Having a close friend or relative who uses smokeless tobacco	Yes	359	83.5
	No	71	16.5
Whether use of smokeless tobacco is beneficial to oneself	Yes	230	53.5
	No	200	46.5

Continued

	Body warmth	58	13.6
	Vaginal tightening	34	7.9
	Reduces blood pressure	25	5.8
	Increases sexual drive	20	8.6
	Sedation	18	4.2
	Not applicable	160	37.7
	Calms depression	24	5.6
	Makes sex enjoyable	13	3.0
Benefits of smokeless tobacco use	Reduces tooth ache	4	0.9
	Increases thinking capacity	5	2.2
	Helps with flu	16	7.0
	It prevents bad dream	11	2.6
	Dries the vagina	4	0.9
	Don't know	11	2.6
	Helps forget problems	19	8.2
	It is one of the pride of the women and in it women find leisure	15	3.5

4.4. Prevalence of Current Smokeless Tobacco Use among Respondents (n = 430)

According to the findings of the current study, **Figure 1** shows that the prevalence of current use of smokeless tobacco, the majority (71.6%) of the respondents reported current use of smokeless tobacco while over a quarter (28.4%) reported not using smokeless tobacco.

4.5. Factors Associated with the Use of Smokeless Tobacco

4.5.1. Knowledge of Smokeless Tobacco

As shown in **Table 4**, the majority of the respondents (95.1%) defined smokeless tobacco correctly and 88.4% agreed that it caused health problems. The majority agreed that smokeless tobacco contains nicotine that causes dependence (81.2%) and that users demonstrated signs of dependence similar to those of cigarette smokers (83.5%). The common effects of smokeless tobacco mentioned included addiction (20.7%) and causing cancer (22.3%). Overall, the majority (89.8%) of respondents expressed good knowledge of smokeless tobacco.

4.5.2. Level Education

Table 5 indicates that most of the respondents attained the secondary level of education (38.4%) and (31.9%) attained the tertiary level of education. However, (23.7%) had been to primary school and (6.0%) had never been to school.

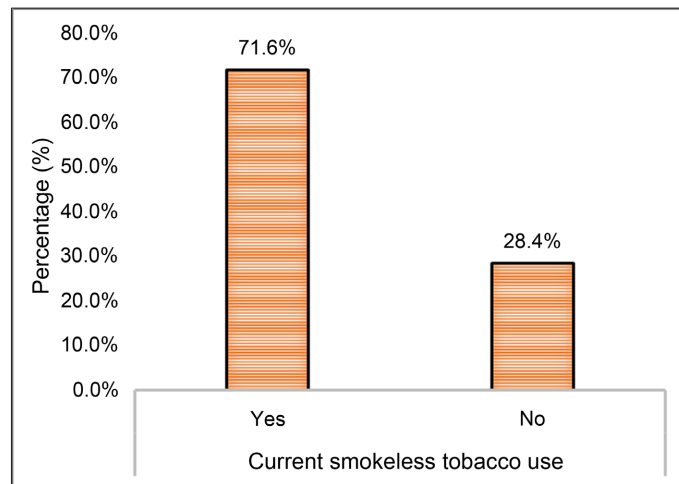


Figure 1. Prevalence of current smokeless tobacco use.

Table 4. Respondents knowledge on smokeless tobacco (n = 430).

Variable	Category	Frequency (n)	Percent (%)
Definition of smokeless tobacco	Correct	409	95.1
	Incorrect	21	4.9
ST can cause health problems	Yes	380	88.4
	No	50	11.6
Smokeless tobacco contains nicotine that causes dependence	Yes	349	81.2
	No	81	18.8
Users of ST demonstrate signs of dependence similar to those of cigarette smokers	Yes	359	83.5
	No	71	16.5
Effects of ST known	Warms the body	52	12.1
	Addiction	89	20.7
	Tooth decay	26	6.0
	Has no effect	18	4.2
	Make someone lose control	14	3.3
	Causes cancer	96	22.3
	Controls blood pressure	26	6.1
	Causes Liver problem	3	0.7
	Tightens and dries vagina	17	3.9
	Causes Tuberculosis	21	4.9
	Causes infertility	5	1.2
Don't know	37	8.6	

Continued

Effects of ST known	Causes kidney failure	2	0.5
	Causes a feeling of satisfaction to your partner	12	2.8
	Increases blood pressure	1	0.2
	Causes anaemia	3	0.7
	Cause abortion	3	0.7
	Helps to un broke the nose	6	1.4
Overall knowledge levels of smokeless tobacco	Poor	44	10.2
	Good	386	89.8

Table 5. Level of education of respondents on the use of smokeless tobacco (n = 430).

Variable	Category	Frequency	Percent (%)
Education level	None	26	6.0
	Primary	102	23.7
	Secondary	165	38.4
	Tertiary	137	31.9

4.5.3. Beliefs

As shown in **Table 6**, more than half of the respondents (57.2%) possess beliefs that promote the use of smokeless tobacco while (42.8) did not. Commonly mentioned beliefs about smokeless tobacco included makes you enjoy sex (36.9%), making the vagina warm (21.5%), treating flu (10.2%), controlling blood pressure (7.7%), colouring the mood (7.3%) and relieves stress (7.3%). 1.6% of respondents mentioned that the use of smokeless tobacco can relieve an asthmatic attack.

4.6. Association between Variables

Table 7 shows that the use of smokeless tobacco among women was significantly associated with the following demographic characteristics; age ($p < 0.0001$), education level ($p = 0.050$), and monthly income ($p = 0.006$). The table further shows that knowledge of smokeless tobacco ($p = 0.003$) and cultural beliefs ($p < 0.0001$) were significantly associated with the use of smokeless tobacco. It was noted that the use of smokeless tobacco was more common among women aged 36 - 45 years (86.6%) and over 45 years (92.3%), women with no formal education (80.8%), those with higher income (83.3%), women with poor knowledge (90.9%) and among women with cultural beliefs (84.9%).

4.7. Univariable and Multivariable Logistic Regression Analysis

Results in **Table 8** shows that at univariable and multivariable analysis, age and

cultural beliefs had an increasing effect on the odds of using smokeless tobacco. Adjusting for other variables, women aged 36 - 45 years (aOR = 3.85, 95% CI = 1.71, 8.68, $p = 0.001$) and those aged over 45 years (aOR = 6.00, 95% CI = 1.95, 18.4, $p = 0.002$) had significantly higher odds of using smokeless tobacco than women aged between 18 and 25 years. Similarly, women who reported having cultural beliefs towards smokeless tobacco use had 4.49 times higher odds of using smokeless compared to women with no cultural beliefs (aOR = 4.49, 95% CI = 2.76, 7.32, $p < 0.0001$).

At univariable analysis, women with good knowledge of smokeless tobacco had 77 percent reduced odds of using smokeless tobacco compared to those with poor knowledge (cOR = 4.39, 95% CI = 2.68, 7.18, $p < 0.0001$). At the same level of analysis, women with a monthly income of over K5000 compared to those with an income of not more than K5000 had higher odds of using smokeless tobacco (cOR = 2.30, 95% CI = 1.26, 4.18, $p = 0.007$). However, the effects of income and knowledge were not significant in multivariable analysis.

Table 6. Beliefs on the use of smokeless tobacco (n = 430).

Variable	Category	Frequency (n)	Percent (%)
Possess beliefs that promoted the use of smokeless tobacco	Yes	246	57.2
	No	184	42.8
Beliefs about the use of smokeless tobacco	Makes one social	24	9.8
	Controls blood pressure	19	7.7
	Increases sex drive	20	4.7
	Makes the vagina warm	53	21.5
	Makes you enjoy sex	159	36.9
	Makes you perform better in bed	25	10.2
	Treats flu	25	10.2
	Colours one's mood	18	7.3
	No response	14	3.3
	Promote sleep	3	0.7
	Brings poverty	14	3.3
	Controls blood pressure	19	7.7
	Relieves stress	18	7.3
	Tighten the vagina	12	2.8
Relieves an asthmatic attack	7	1.6	
Prevents bad dreams	11	2.6	

Table 7. Cross-tabulations between use of smokeless tobacco and independent variables.

Variable	Category	Use of smokeless tobacco		p-value
		No. (%)	No (%)	
Age in years	18 - 25 years	81 (41.3)	115 (58.7)	<0.0001
	26 - 35 years	26 (26.0)	74 (74.0)	
	36 - 45 years	11 (13.4)	71 (86.6)	
	Over 45 years	4 (7.7)	48 (92.3)	
Education level	None	5 (19.2)	21 (80.8)	0.050
	Primary	21 (20.6)	81 (79.4)	
	Secondary	47 (28.5)	118 (71.5)	
	Tertiary	49 (35.8)	88 (64.2)	
Monthly income	≤K5000	107 (31.5)	233 (68.5)	0.006
	>K5000	15 (16.7)	75 (83.3)	
Knowledge of smokeless tobacco	Poor	4 (9.1)	40 (90.9)	0.003
	Good	118 (30.6)	268 (69.4)	
Cultural beliefs	No	88 (42.9)	117 (57.1)	<0.0001
	Yes	34 (15.1)	191 (84.9)	

Ch = Chi-Square.

Table 8. Univariable and multivariable logistic regression analysis results on the use of smokeless tobacco among women in Kasama district.

Variables	Univariable analysis			Multivariable analysis		
	cOR	CI (95%)	p-value	aOR	CI (95%)	p-value
Age group						
18 - 25 years	Ref			Ref		
26 - 35 years	2.00	1.18, 3.40	0.010	1.76	0.96, 3.20	0.065
36 - 45 years	4.55	2.27, 9.12	<0.0001	3.85	1.71, 8.68	0.001
Over 45 years	8.45	2.93, 24.4	<0.0001	6.00	1.95, 18.4	0.002
Education level						
None	Ref			Ref		
Primary	0.92	0.31, 2.72	0.878	0.99	0.30, 3.29	0.985
Secondary	0.60	0.21, 1.68	0.329	0.83	0.26, 2.60	0.747
Tertiary	0.43	0.15, 1.20	0.108	0.57	0.18, 1.80	0.338
Monthly income						
≤K5000	Ref			Ref		
>K5000	2.30	1.26, 4.18	0.007	1.59	0.77, 3.27	0.206

Continued

Knowledge on ST						
Poor	Ref				Ref	
Good	0.23	0.08, 0.65	0.006		0.34	0.11, 1.06 0.064
Cultural beliefs						
No	Ref				Ref	
Yes	4.23	2.67, 6.68	<0.0001		4.49	2.76, 7.32 <0.0001

cOR = Crude Odds Ratio, aOR = adjusted Odds Ratio, CI = Confidence Interval, ST = Smokeless Tobacco.

5. Discussion

5.1 Characteristics of the Respondents

The key background characteristics included age, tribe, marital status, religion, area of residence, employment status and monthly income.

Smokeless tobacco use may vary with age. In the current study, most of the respondents were in the age groups of 18 - 25 years 45.6% followed by the age group of 26 - 35 years 23.2% (100) which corresponds with the study conducted in Ndola-Zambia [6], which revealed that the majority 39 (53%) of snuff users were between the age of 18 - 28 years with mean age of 33.92. The reason for this might be because the two towns are provincial headquarters of Zambia and women are exposed to social media and possibly getting the same information. This is also similar to the two studies done in Tanzania [9] which revealed that the peak age range of using snuff was around 15 - 40 years, though Warren and friends [10] revealed that the prevalence of using snuff starts as early as 12 years in young ladies because of peer pressure and envying their role models. However, the current findings are contrary to the study which was conducted in Lagos, Nigeria, where most of the respondents were aged between 21 - 40 years 5 (4.9%) [11].

Table 1 shows that among respondents majority were Bemba 49.8% (214), Mambwe 17.9% Ngoni 7.2% (31), Tonga 7.0% and other tribes 18.1%. This is attributed to the nature of the study settings where the Bemba are the majority in the northern province hence the tribe is insignificant there making one tribe always prominent in one region than others. The majority of the respondents were not married 52.8% (227) Marital status may be associated with tobacco use this is in line with a study conducted in Nigeria where some current users of SLT were divorced/separated or widowed with the P-value of 0.002 [11], and this finding was statistically significant. This might be because marital problems like divorce, separation or even the loss of a spouse may cause people to use ST products as a means of coping with marital challenges. In the 2014 Kenya demographic health survey, similar findings were noticed among men, but not among women [12]. This is contrary to the study that was conducted in Ndola-Zambia [6], which revealed that most of the respondents (53%) were married. The current study is also contrary to the study that was conducted in Nigeria

where half of the respondents were married [11]. The current study revealed that Christianity was the commonest religious affiliation 93.7% (403) according to **Table 2** which is also in relation to the study conducted in Ndola-Zambia [6], this could be due to the fact that Zambia is a Christian nation the majority of the citizens are Christians.

Over half, 53.7% (231) lived in urban settlements and the majority, 80% (344) were unemployed this could be as the fact that only 45% [13] of women are employed in Zambia. Majority, 79.1% (340) of the respondents reported a monthly income of not more than K5000 which could attribute to minimum wage set by the Zambian government. In the current study, at univariable analysis, women with a monthly income of over K5000 compared to those with an income of not more than K5000 had higher odds of using smokeless tobacco (cOR = 2.30, 95% CI = 1.26, 4.18, $p = 0.007$). This means that those with higher income have more access to smokeless tobacco or they have extra money to access the commodity. However, the effects of income and knowledge were not significant in multivariable analysis.

5.2. Use of Smokeless Tobacco

In the current study, 33% (142) of the respondents used smokeless tobacco daily and over a third used smokeless tobacco twice 35.4% (109) daily and this is contrary to the study which was done in Ndola-Zambia [6], where most women had used snuff up to ten times (37.0%) per day; 11 to 20 times (34.2%) and 21 to 30 times (23.3%). Fewer women had used snuff for more than 31 times (2.7%) or not used it at all (2.7%). However, the findings of the current investigator reveal that the use of smokeless tobacco among women of Kasama is not as bad as women of Ndola, nevertheless, it could have an impact on the Zambian economy as urge amount of resources could be used if these women present with the health problems.

The current study further found that most respondents used smokeless tobacco daily 33% (142) and between 2 - 4 days 35.1% (151). Over a third used smokeless tobacco twice 35.4% (109) and three 33.4% (103) times daily. Over half, 52.6% (162) of the respondents first used smokeless tobacco between 18 and 25 years and about half, 46.1% (142) had been using smokeless tobacco for over 5 years compared to the study which was done in India where nearly 17% of women initiated ST use before the age of 15 (Global Adult Tobacco Survey (GATS) [14]).

In the current study, over half, 54.5% (168) of the respondents were trying to cut down on smokeless tobacco use, mainly due to health reasons 40.5% (68) and stigma 30.9% (52). This is contrary to the study which was done in India where more than 50 per cent (54.4%) of women SLT users were not interested in quitting, only 2.7 per cent sought pharmacotherapy and 8.4 per cent underwent counselling at local cessation centers or through telephone Quitline/helpline (Global Adult Tobacco Survey GATS 2 [14]). While only 4.3 per cent of the women opted for traditional methods to enable cessation, 71.6% attempted ces-

sation without any assistance (Global Adult Tobacco Survey GATS 2 [14]). This indicates an intrinsic issue with respect to access and willingness to enroll in cessation programmes or quitting practices as these centers often receive a low number of female ST users and participants. Low support for cessation, associated stigma and low access to cessation methods are some of the factors that may act as barriers to cessation among men and women. There is limited research on the intention to quit and barriers to cessation among women that need to be understood to facilitate quitting and awareness.

This clearly indicates that healthcare facilities and awareness about the very nature of their health soundness is very much lacking since it takes one to have a health problem to make a decision to quit. Besides, studies have reported that women have less success in quitting; therefore, more complex approaches may be needed to achieve better outcomes. Intensive counseling would address the circumstances that create obstacles to cessation. Awareness and advocacy are also needed.

However, these findings indicate clearly that women should be targeted in smoking cessation campaigns and it is important to target prevention messages to young people in schools and communities before they pick up tobacco smoking habits.

5.3. Knowledge

Knowledge is the information, understanding and skills that one gains through education or experience [15]. Section B of the questionnaire comprised the questions on knowledge of smokeless tobacco. The questions helped the researcher to assess whether respondents knew the definition of ST, whether ST can cause some health problems, content of ST and their health effects.

According to the global impact of tobacco control policies on smokeless tobacco [16], an earlier systematic review highlighted that 138 parties to WHO's Framework Convention on Tobacco Control defined smokeless tobacco in their statutes and in the current study majority of the respondents defined smokeless tobacco correctly 95.1% (409) and agreed that it caused health problems 88.4% (380). This is in line with the study which was conducted in India [17], which states that SLT use among women has been inversely associated with increasing levels of education, wealth and knowledge about the health effects. Despite knowing the health problems women are going on and using the ST. Contrary to the international journal (2015) women hold a strong conception that tobacco does not only harm them but has also medicinal effects for the case of toothache, better digestion, acts as an anti-flatulence and also for smooth defecation process. Therefore, development of awareness materials and using information, education and communication strategies on ST use is of utmost importance. Specific strategies such as enhanced health communication through the packaging of ST products depicting health risks are required.

The majority agreed that smokeless tobacco contains nicotine that caused dependence 81.2% (349) and that demonstrated signs of dependence similar to

those of cigarette smokers 83.5% (359) this is in accordance with the European Journal of Public Health volume 26 (2016), which revealed that among current smokers, snus users had a similar cigarette consumption compared with non snus users, in contrast with a study from Norway showing that dual users smoked less than exclusive smokers [18], (i.e. prevalence of 9%), suggesting that smokeless tobacco use may represent a gateway for nicotine addiction.

In this study, some of the common effects of smokeless tobacco are known including addiction 20.7% (89) and causing cancer 22.3% (96). This is in line with the study which was conducted in India [17], that revealed that among women, SLT has been associated with the risk of oral cancers and pharyngeal cancers, cancer of the gums and buccal mucosa, oesophageal cancer, upper aero-digestive tract cancer, cervical cancer, ischaemic heart disease and osteoporosis. A meta-analysis revealed a higher risk for oral cancer among female SLT users with an odds ratio (OR) of 5.83 (95% CI: 2.93 - 11.58).

The other effects that were eluded to the current study included warming of the body temperature (12.1%) and tightening the vagina (3.9%) which is in line with the study carried out among South African young women demonstrated that women often insert snuff as a reference point of tightening the vagina and feeling tight like that of a child [19]. On the other hand, in the current study, some respondents expressed that the use of ST helped them to control their BP (6.1%). This is in harmony with a study that was conducted in Ndola [6], where Snuff was significantly regarded as medicine for different diseases and conditions such as headache, flu, Blood pressure, toothache, stress and depression. 21.9% of the 73 participants affirmed the use of snuff for pharmacology purposes. This is also in agreement with the study done in Madagascar which revealed that snuff is a control measure of neuropsychological disorders such as stress, anxiety and depression giving 41% (Harrison *et al.*, 2009), though not concurrent with the study done in South Africa (Global Adult Tobacco Survey (GATS) [14]) which revealed that snuff does not reduce stress and Bp. levels.

However, in the current study, the majority 89.8% (386) of respondents expressed good knowledge of smokeless tobacco. As we know the level of knowledge of the ill effects of tobacco products, individual attitudes towards the use of tobacco and perception of social acceptance are the major determinants of tobacco use. On the other hand, the misconception that the use of smokeless tobacco has medicinal value for curing or reducing discomforts such as flu, BP, and lack of sleep could have led to the high prevalence of the use of smokeless tobacco. Despite having knowledge of ST and any form of tobacco products, knowledge and awareness of the adverse impact of tobacco use, women are still using it therefore, need to strengthen educating the public on the health benefits of quitting smoking and design gender-sensitive cessation centers, orientation of individuals engaged in cessation efforts on enabling a women-friendly environment for quitting is crucial.

5.4. Educational Level

SLT use among women has been inversely associated with increasing levels of education, wealth and knowledge about the health effects [20]. Most of the respondents in the current study attained secondary 38.4% (165) and tertiary 31.9% (137) level education. This corresponds to the study conducted in Nigeria which revealed that most of respondents had a high educational level or more (83.5%) [11]. However, the majority of the respondents in this 38.9% attained a secondary educational level this could be a result of opening/up-grading of basic schools to secondary schools and free education being offered in the country and this can help in changing the economic status of the country. The current study showed that 23.7% (102) attained primary educational level and 6.1% (18) never attended school, this coincides with the study conducted in India which revealed that adults with some primary school education showed the highest prevalence of dual-use (8.3%) of smokeless tobacco compared to individuals with other levels of education [21]. Education was independent significantly. Since knowledge is associated with education level, in the current study, women with no formal education have 80.8% chances of using ST as compared with those with formal education and this finding is contrary to the study conducted in Kaoma and Kasama where participants with no formal education were 49% (AOR=1.49, 95% CI [1.08, 2.06]) more likely to smoke than those with formal education [22].

5.5. Beliefs

As shown in **Table 5** the majority of respondents had a friend/relative that used smokeless tobacco 83.5% (359) this is in line with the international journal [23] a qualitative study that revealed that Peer influence is a very important factor reported by the participants (20%) for their chewing status of smokeless tobacco. People who have friends who chew tobacco are the most vulnerable group of people. Some participants reported cases of being compelled and forced to take up tobacco. They said, they are often under pressure from their peers to take up tobacco, and to refuse would not be pleasing to their friendship therefore, they have to take up.

Results in **Table 7** show that at both univariable and multivariable analysis, age, religion and cultural beliefs had an increasing effect on the odds of using smokeless tobacco. Therefore, the use of smokeless tobacco and cultural beliefs are significant with the p-value < 0.0001. This is contrary to the study conducted in Ndola-Zambia, which showed social factors to be less significant in the use of snuff giving details of strengthening a bond as friends and being known in the world of snuff users [6] but in line with the study that was conducted in South Africa with 43 (19.5%) out of 220 participants who acknowledged that snuff usage helps women to form a strong bond of friendship, putting an invitation to a friend which they regard as sacred and family identification [24]. This is also concurrent with a study done in Congo DR. 27 (50.1%) of 53 [25] which revealed that peer/social networks are a strong risk factor for both the initiation and progression to regular use.

The current investigation found that over half, 53.5% (230) thought smokeless was beneficial to them. Commonly mentioned benefits of smokeless tobacco included body warmth 25.7% (59) and vaginal tightening 11.7% (27). Other benefits mentioned were: control of BP 7.7% (19), colour the mood 7.3% (19), relief of stress 7.3% (18), it makes sex enjoyable 4.9% (11), helps one to forget problems 8.3% (19), it helps in the treatment of flu 7.0% (16) and it is able to sedate 7.4% (17). This coincides with the study conducted among married women in Mumbai, India, SLT use was found to be attributed to reducing stress, providing pleasure, associated companionship with peers at the workplace and in the neighborhood, increasing energy for workload and suppressing hunger when dietary requirements were not met [26].

Corresponding with the current study, a study carried out among South African young women demonstrated that women often insert snuff as a reference point of tightening the vagina and feeling tight like that of a child [19]. In another study carried out in Tanzania 70% and in South Africa 80% of women confirmed that vaginal temperature regulation is a very common use of snuff though the idea is uncommon in Western countries [16] who favour condoms. In Zimbabwe, 60% of women do not favour condoms as heat lubricant but snuff [27].

In this study, over half, 57.2% possessed beliefs about the use of smokeless tobacco and making the vagina warm was the most common 21.5% reported belief among respondents. This is in line with a study done in South America, which confirmed that snuff usage is a preservative of culture and identity especially to women, like the South American Indian tradition (77%) use it for purification, connection with the divine, and recreation [14]. However, contrarily with the study conducted in Ndola-Zambia where the study found that using snuff was not significantly culturally born as only 2 (2.7%) out of 73 participants agreed to this claim though it is a practice that has a long history in the Zambian rural set up among old women [6].

Since the current study has shown that both univariable and multivariable analysis, age, religion and cultural beliefs had an increasing effect on the odds of using smokeless tobacco it is recommended that mass health campaigns concerning the effects of smokeless tobacco and education on the health hazards of smokeless tobacco are required to control and minimize its usage for long term healthy living.

6. Limitations of the Study

The limitations of the study were that participants reported themselves on their smoking habits and no biochemical analyses were done to triangulate smoking status.

7. Conclusion

In view of the current findings, it is important to involve local radio stations in

the dissemination of information on the cultural issues that have to deal with the use of smokeless tobacco in order to change the attitude of the upcoming generation.

Furthermore, since the majority of the respondents are of reproductive age, continuous IEC is important in all health facilities.

Declaration

I, Gloria Kangwa, do hereby declare to the Senate of the University of Zambia that this dissertation is my own original work and has neither been submitted nor been concurrently submitted for degree award in any other institution.

Ethics Approval and Consent to Participate

Ethical clearance was obtained from the University of Zambia Biomedical Ethic Committee Biomedical Research Ethics Committee (UNZABREC) (REF NO. 3147-2022) and the National Health Research Authority (NHRA) (REF NO. NHRAR-R-162/16/2003).

Availability of Data and Material

The datasets used and/or analysed during the current study are available from the corresponding author and the University of Zambia on reasonable request.

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Authors' Contributions

GK, CZ, KC and JM contributed to the conception of the project, proposal writing, data collection, data analysis, study supervision and manuscript writing.

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Conflicts of Interest

The authors declare that they have no competing interests in this study.

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