

## Original Article

## Association between Exposure to Smokeless Tobacco Consumption and Carcinoma of Cervix

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**Background:** Cervical cancer is the most destabilizing cancer that grows increasingly prevalent worldwide. The Southeast Asia region has the greatest incidence and mortality rates due to widespread use of smokeless tobacco (SLT) products, a lack of screening programmes, and immunization against cervical cancer. **Objective:** To assess the association between smokeless tobacco consumption and carcinoma of cervix. **Methodology:** A case-control study was conducted with 272 women aged 18-49 years, conveniently selected from both outpatient and inpatient settings at the National Institute of Cancer Research and Hospital (NICRH) in Dhaka, Bangladesh. The selection of NICRH was purposive. Participants underwent interviews using a pre-tested, semi-structured questionnaire between January and December 2019. **Results:** The mean age of cases was 49.8±8.8 years, while the mean age of controls was 48.5±9.3 years. In comparison to controls (52.2%), the majority of patients (65.4%) consumed SLT throughout their entire lives. A significant relationship was found between SLT use and the development of cervical cancer (p<0.05). Those who have consumed any SLT in their lives are 1.7 times more likely to develop cervical cancer than those who have not taken any SLT. Cases (22.8%) used betel quid with jorda >5 times, compared to controls (14.7%), and intensity of Gul used ≤5 among cases (9.6%) than controls (2.9%). Compared to controls (56.3%), the majority of cases (76.4%) had been using SLT for more than 10 years, with a statistically significant difference (p<0.05). Cases used SLT for a longer time (19.2±10.3) compared to controls (15.6±11.1), with a significant association (p<0.05). **Conclusion:** The study revealed a significant association between the risk of cervical cancer and the extent and duration of exposure to SLT. To minimize the risk of cervical cancer, contemplate restricting SLT production and utilization.

**Key Words:** Exposure, SLT, Cervical cancer, Bangladesh.**Received:** 12 March, 2024; **Accepted:** 22 May, 2024; **Published:** 1 June 2024**DOI:** <https://doi.org/10.3329/jmcmc.v10i1.75990>**Correspondence:** Mohammad Nurunnabi, Assistant Professor, Department of Community Medicine and Public Health, Sylhet Women's Medical College, Sylhet 3100, Bangladesh. Email: nur.somch@gmail.com Mobile: +880 1717870559 Orchid ID: <https://orcid.org/0000-0001-9472-9369>**How to cite this article:** Subnum S, Bhadra S, Rahman T, Mizan MN, Moulee ST, Mim NS, Hamid S, Nurunnabi M. Association between Exposure to Smokeless Tobacco Consumption and Carcinoma of Cervix. J Monno Med Coll. 2024 June;10(1):17-22**Copyright:** This article is published under the Creative Commons CC BY-NC License (<https://creativecommons.org/licenses/by-nc/4.0/>). This license permits use, distribution and reproduction in any medium, provided the original work is properly cited, and is not for commercial purposes.**Introduction:**

Cancer is the most destructive disease, posing a global threat of death. Cancer is a generic word for a vast set of disorders characterized by the proliferation of aberrant cells

beyond their usual borders, which can then infiltrate adjacent sections of the body and/or spread to other organs.<sup>1</sup> It is a sickness in which the body's cells proliferate without control. Cancer is usually named for the portion of the body

where it first appears, even if it spreads to other parts later. When cancer begins in the cervix, it is known as cervical cancer<sup>2</sup>. Women over 30 have a higher risk of having cervical cancer.<sup>3,4</sup> Cancer-causing infections, such as human papillomavirus (HPV) and hepatitis, account for around 30% of cancer cases in low- and lower-middle-income countries.<sup>1,5</sup> Long-term infection with certain forms of HPV is the primary cause of cervical cancer.<sup>6,7</sup> Cervical cancer can be readily avoidable because there are very effective screening tests (VIA, PAPs smear test), and a highly efficient vaccination to prevent HPV infections is available.<sup>8,9</sup>

Cancer is the most prevalent cause of death worldwide, accounting for almost 10 million fatalities in 2020, or almost one in every 6 deaths. Tobacco use, high body mass index, alcohol consumption, low fruit and vegetable diet, and lack of physical activity account for almost one-third of cancer-related fatalities.<sup>1,10</sup> Cervical cancer is the 4<sup>th</sup> most prevalent malignancy among women worldwide. Over 500,000 new cases were reported in 2018, with 604,000 expected in 2020, and 342,000 deaths in 2020. According to research from 2014-2016, approximately 0.6% of women will develop cervical cancer at some point in their lives.<sup>11-13</sup> Cancer-related death rates in Bangladesh were anticipated by the International Agency for Research on Cancer to reach 7.5% in 2005 and 13% by 2030. Cervical cancer is the 2<sup>nd</sup> most frequent malignancy among women aged 15-49 years in Bangladesh.<sup>14</sup> In Bangladesh, around 8,068 new cervical cancer cases are detected each year, with an estimated 5,214 deaths. In Bangladesh, cervical cancer deaths accounted approximately 18% of all cancer-infected women. It means that in Bangladesh, on average, 28 women die each day from cervical cancer.<sup>15,16</sup>

Tobacco usage is one of the most serious public health issues the world has ever faced. Tobacco use has been epidemic in recent years, despite the fact that we have known about the adverse effects of tobacco use for many years and decades. There are about 1.3 billion smokers globally, with millions or more using various oral tobacco products.<sup>17</sup> According to WHO, almost 80% of the world's 1.1 billion smokers live in middle-income and low-income countries, which bear the largest burden of tobacco-related sickness and mortality. Tobacco usage causes more than 6 million deaths each year around the world. Nearly two-thirds of these deaths occur in underdeveloped countries.<sup>18,19</sup>

In Bangladesh, the prevalence of smokeless tobacco (SLT)

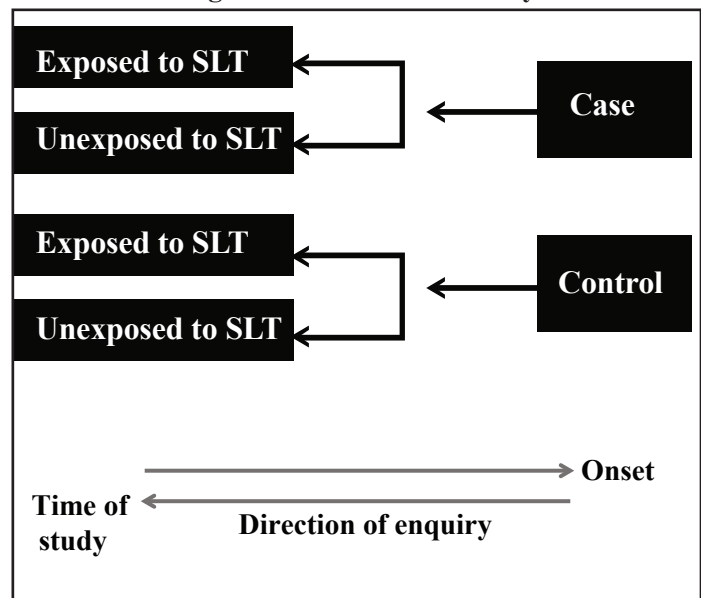
is 27%. Tobacco addiction has become not only a major contributor to the country's high morbidity, but also the largest strain on the country's economy.<sup>20,21</sup> Several statewide studies in Bangladesh pointed out the high prevalence of both smoking and the habit of SLT.<sup>21-23</sup> Easy accessibility and cost, as well as misconceptions about its beneficial health consequences, are major contributing factors to increased smokeless tobacco consumption. While many people are aware that tobacco is harmful, the majority of users are unaware of the deadly link between SLT and fatal illness.<sup>24</sup>

### Methodology

**Study design and settings:** This case-control study was carried out to in the outpatient and inpatient settings of National Institute of Cancer Research and Hospital (NICRH), Mohakhali, Dhaka 1212, Bangladesh from January and December 2019 for duration of one year.

**Selection of cases and controls:** The study included 272 women aged 18-49 years from NICRH's Gynaecological Oncology Department, both inpatient and outpatient during the study period. The study place was chosen purposefully. Cases were drawn from the NICRH, whereas controls were drawn from the hospital VIA center. In group case group, 136 married patients aged 18 to 49 years who tested positive for VIA and were diagnosed with Ca. cervix were interviewed conveniently in the hospital. In control group During the same study period, 136 married female patients aged ±5 years who were VIA negative and non-smokers were also interviewed conveniently in the hospital.

### A schematic diagram of case-control study:



**Data Collection Procedures:** A face-to-face semi-structured questionnaire that had been pretested was used to interview the study participants between January and December 2019. The questionnaire's pretest was conducted at Bangabandhu Sheikh Mujib Medical University (BSMMU), in Dhaka, in the Department of Gynaecological Oncology.

**Statistical Analysis:** Collected data were checked, edited, coded, and recoded by using IBM SPSS version v25. Descriptive statistics such as mean, standard deviation and percent were computed for continuous variables of the participants. Chi-square test was used to assess the significance of associations between two nominal variables. To compare mean of continuous variables in two groups independent sample 't' test was done. Odds ratio and p-value of <0.05 and at a 95% confidence interval was taken as significant. Both univariate and multivariate analysis was done as required to find out Crude ORs and adjusted ORs. The results were presented in tables and chart.

**Ethical Approval:** Informed written consent was obtained from each participant. Ethical approval was obtained from the Institutional Review Board (IRB) of the National Institute of Preventive and Social Medicine (NIPSOM), Dhaka 1212, Bangladesh. (NIPSOM/IRB/ 2019/111)

## Results

**Socio-demographics characteristics:** The majority of cases 87(64.0%) were >49 years, compared to 75(55.1%) of controls. Mean age of cases was 49.8±8.8 years where mean age of controls was 48.5±9.3 years. The majority of cases 117(86.0%) were Muslim, as opposed to controls 131(96.3%). Above two-thirds of the cases 103(75.7%) were married, while 114(83.8%) of controls. The level of education diversified between cases and controls, with more cases 103(75.7%) being illiterate than controls 75(55.1%). The majority of the patients 133(97.8%) were homemakers, compared to the controls 124(91.2%). A greater percentage of cases' husbands were agricultural workers 37(27.2%), while the control's husbands were 38(27.9%). The mean household income in cases was 15,066.2±6,069.0 taka, while in controls it was 16,139.7±8,061.9 taka. More than half of cases' husbands were smokers 87(64.0%) and in control 74(54.4%). In the cases, 19(14.0%) of husbands were not circumcised, compared to 5(3.7%) in the controls group. (Table 1)

**Table 1: Socio-demographic characteristics of the cases and controls (n=272)**

| Characteristics                         | Cases            | Controls         |
|---|------------------|------------------|
|   | n(%)             | n(%)             |
| <b>Age group (years)</b>                |                  |                  |
| 18-49                                   | 49(36.0)         | 61(44.9)         |
| >49                                     | 87(64.0)         | 75(55.1)         |
| Mean±SD                                 | 49.8±8.8         | 48.5±9.3         |
| <b>Religion</b>                         |                  |                  |
| Muslim                                  | 117(86.0)        | 131(96.3)        |
| Others                                  | 19(14.0)         | 5 (3.7)          |
| <b>Marital status</b>                   |                  |                  |
| Married                                 | 103(75.7)        | 114(83.8)        |
| Single                                  | 33(24.3)         | 22(16.2)         |
| <b>Education</b>                        |                  |                  |
| Illiterate                              | 96(70.6)         | 75(55.1)         |
| Primary and above                       | 40(29.4)         | 61(44.9)         |
| <b>Occupation</b>                       |                  |                  |
| Homemaker                               | 133(97.8)        | 124(91.2)        |
| Others                                  | 3(2.2)           | 12(8.8)          |
| <b>Husband's occupation</b>             |                  |                  |
| Agricultural worker                     | 37(27.2)         | 38(27.9)         |
| Day laborer                             | 35(25.7)         | 29(21.3)         |
| Businessman                             | 35(25.7)         | 34(25.0)         |
| Service holder                          | 11(8.1)          | 20(14.7)         |
| Others                                  | 18(13.2)         | 15(11.0)         |
| <b>Monthly household incomes (taka)</b> |                  |                  |
| ≤5,000                                  | 3(2.2)           | 3(2.2)           |
| 5,001-10,000                            | 28(20.6)         | 25(18.4)         |
| 10,001-15,000                           | 62(45.6)         | 48(35.3)         |
| >15,000                                 | 43(31.6)         | 60(44.1)         |
| Mean±SD                                 | 15,066.2±6,069.0 | 16,139.7±8,061.9 |
| <b>Husband's smoking status</b>         |                  |                  |
| Smoker                                  | 87(64.0)         | 74(54.4)         |
| Non-smoker                              | 49(36.0)         | 62(45.6)         |
| <b>Husband's circumcision status</b>    |                  |                  |
| Circumcised                             | 117(86.0)        | 131(96.3)        |
| Not circumcised                         | 19(14.0)         | 5(3.7)           |

## Utilization and intensity of SLT usage

In comparison to controls (52.2%), the majority of patients (65.6%) ever consume SLT in their lifetime; and in relation to controls (47.8%), the remaining cases (34.6%) didn't ever consume SLT (Figure 1). As a contrast to controls (78.9%), the majority of cases (84.3%) started using SLT between the ages of 18 and 35, with a mean age of 30.2±9.1 years in cases and 34.6±10.7 in controls. The mean duration of SLT use was higher in cases (19.2±10.3 years) than in controls (15.6±11.1 years). Cases (22.8%) used betel quid with jorda >5 times, compared to controls (14.7%); and intensity of Gul utilized ≤5 among cases (9.6%) over controls (2.9%). (Table 2)

**Table 2: Utilization and intensity of SLT usage among the women (n=272)**

| Attributes                                 |             | Cases     | Controls  |
|--|-------------|-----------|-----------|
|  |             | n(%)      | n(%)      |
| <b>Utilization of SLT</b>                  |             |           |           |
| Age of start of SLT consumption (n=89, 71) | <18 years   | 5(5.6)    | 1(0.1)    |
|  | 18-35 years | 75(84.3)  | 56(78.9)  |
|  | >35 years   | 9(10.1)   | 14(19.7)  |
|  | Mean±SD     | 30.2±9.1  | 34.6±10.7 |
| Duration of SLT usage (n=89, 71)           | ≤10 years   | 21(23.6)  | 31(43.7)  |
|  | >10 years   | 68(76.4)  |           |
|  | Mean±SD     | 19.2±10.3 | 15.6±11.1 |
| <b>Intensity of SLT usage</b>              |             |           |           |
| Betel quid with jorda                      | ≤5 times    | 29(21.3)  | 29(21.3)  |
|  | >5 times    | 31(22.8)  | 20(14.7)  |
| Betel quid with sadapata                   | ≤5 times    | 4(2.9)    | 4(2.9)    |
|  | >5 times    | 5(3.7)    | 3(2.2)    |
| Only sadapata                              | ≤5 times    | 4(2.9)    | 3(2.2)    |
|  | >5 times    | 5(3.7)    | 3(2.2)    |
| Gul  | ≤5 times    | 13(9.6)   | 4(2.9)    |
|  | >5 times    | 1(0.7)    | 2(1.5)    |
| Betel quid without jorda                   | ≤5 times    | 12(8.8)   | 11(8.1)   |
|  | >5 times    | 1(0.7)    | 2(1.5)    |

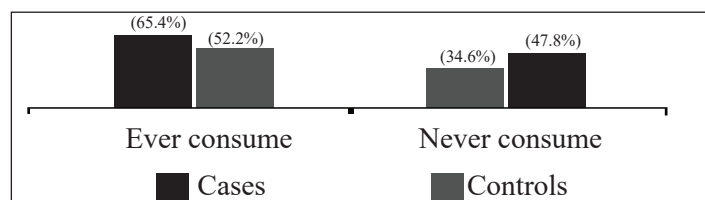
The majority of cases (70.6%) were illiterate compared to controls (55.1%), with a significant difference (p=0.010). When compared to controls, cases with an illiterate education level were 1.95 times more likely to develop cervical cancer. There was a significant difference (p=0.005) between the

number of Muslim controls (96.3%) and cases (86.0%). Those who were not Muslims, as opposed to those who were Muslims, had a 0.23-fold higher risk of developing cervical cancer. The majority of control husbands (96.3%) were circumcised, as opposed to the cases' husbands (86.0%). Those whose husbands were not circumcised had a 0.24 times higher risk of developing cervical cancer than those whose husbands were circumcised. In comparison to controls (52.2%), the majority of patients (65.4%) have consumed SLT throughout their lifetime. A significant association was found between SLT use and the development of cervical cancer (p=0.04). Those who have ever consumed any SLT in their lives have a 1.7 times greater risk of developing cervical cancer than those who have never consumed SLT. The highest number of cases (84.3%) start SLT use at the age of 18-35 years in comparison to controls (78.9%) and a significant association was found (p=0.032). There was a significant difference (p=0.005) in the mean age of start of consumption of SLT among controls (34.6±10.7) and cases (30.2±9.1). In comparison to controls (56.3%), the majority of cases (76.4%) had been using SLT for >10 years, with a statistically significant difference (p=0.008). Cases had a prolonged mean duration of SLT usage (19.2±10.3) than controls (15.6±11.1), with a significant association (p=0.040). (Table 3 and Figure-I)

**Table 3: Comparison of different variables between cases and controls**

| Attributes                      |                 | Cases     | Controls  | p-value (χ2 test) | OR 95% CI of OR      |
|---------------------------------|-----------------|-----------|-----------|-------------------|----------------------|
|                                 |                 | n(%)      | n(%)      |                   |                      |
| Education                       | Illiterate      | 96(70.6)  | 75(55.1)  | *0.010            | 1.95(3.22-1.18)      |
|                                 | Primary & above | 40(29.4)  | 61(44.9)  |                   |                      |
| Religion                        | Muslim          | 117(86.0) | 131(96.3) | *0.005            | 0.23(0.09-0.65)      |
|                                 | Others          | 19(14.0)  | 5 (3.7)   |                   |                      |
| Husband's circumcision status   | Circumcised     | 117(86.0) | 131(96.3) | *0.005            | 0.24(0.09-0.65)      |
|                                 | Not circumcised | 19(14.0)  | 5(3.7)    |                   |                      |
| Utilization of SLT              | Ever consume    | 89(65.4)  | 71(52.2)  | *0.040            | 1.70(1.06-2.82)      |
|                                 | Never consume   | 47(34.6)  | 65(47.8)  |                   |                      |
| Age of start of SLT consumption | <18 years       | 5(5.6)    | 1(0.1)    | *0.032            |                      |
|                                 | 18-35 years     | 75(84.3)  | 56(78.9)  |                   |                      |
|                                 | >35 years       | 9(10.1)   | 14(19.7)  |                   |                      |
|                                 | Mean±SD         | 30.2±9.1  | 34.6±10.7 |                   | t= -2.822, p= *0.005 |
| Duration of SLT usage           | ≤10 years       | 21(23.6)  | 31(43.7)  | *0.008            |                      |
|                                 | >10 years       | 68(76.4)  | 40(56.3)  |                   |                      |
|                                 | Mean±SD         | 19.2±10.3 | 15.6±11.1 |                   | t= 1.520, p= *0.040  |

\*Statistically significant value



**Figure-I: SLT utilization status of the women (n=272)**

Among the cases, there was a significant positive correlation (p=0.000) between the age and duration of passive smoking exposure. Among the controls, age had a significant and positive relationship with the duration of SLT exposure (p=0.000). There was a significant negative correlation (p=0.004) between the years of SLT exposure

and total family income among cases, but not among controls. There was a positive correlation among cases between husband smoking duration and total SLT exposure. The relationship was statistically significant ( $p=0.004$ ), but not among the controls. (Table 4)

**Table 4: Correlation between duration of SLT use with different variables**

| Attributes               | Duration of SLT |         |          |         |
|--------------------------|-----------------|---------|----------|---------|
|                          | Cases           |         | Controls |         |
|                          | R               | p-value | R        | p-value |
| Age group (years)        | 0.444           | *0.000  | 0.458    | *0.000  |
| Household income         | -0.292          | *0.004  | 0.007    | 0.960   |
| Husband's smoking status | 0.449           | *0.004  | 0.126    | 0.597   |

### Discussion

The mean age of cases was  $49.8\pm 8.8$  years, while the mean age of controls was  $48.5\pm 9.3$  years. Above two-thirds of the cases (75.7%) were married, while 83.8% were controls. Cervical carcinoma was found to be more prevalent among 48-62-year-old women in a study done in the Philippines married women, where the mean age was 47.2 years for cases and 48.4 years for controls.<sup>25</sup> The majority of cases (70.6%) were illiterate compared to controls (55.1%), with a significant difference ( $p=0.010$ ). When compared to controls, cases with an illiterate education level were 1.95 times more likely to develop cervical cancer. The majority of the patients (97.8%) were homemakers, compared to the controls (91.2%). A similar age-matched case-control study conducted in India found that cases had a lower education level than control subjects (OR of 2.7 for no education), while the majority of cases and controls who were housewives had an OR of 4.3.<sup>26</sup> This apparent similarity is due to India's proximity to our country and similar economic conditions. The mean household income in cases was  $15,066.2\pm 6,069.0$  taka, compared to  $16,139.7\pm 8,061.9$  taka in controls.

The majority of control husbands (96.3%) were circumcised, whereas the cases' husbands (86.0%) were not. Those whose husbands were not circumcised were 0.24 times more likely to develop cervical cancer than those whose husbands were circumcised. A similar finding was reported in a study carried out by Bosch et al., which also reveals circumcision is preventative for cervical cancer (OR = 0.75).<sup>25</sup> Cases used SLT for a longer time ( $19.2\pm 10.3$ ) compared to controls ( $15.6\pm 11.1$ ), with a significant association ( $p=0.040$ ). In a Bangladeshi study, substantial

and long-term SLT usage was found to be highly associated with cervical cancer.<sup>20</sup>

### Conclusion

The educational level of women; the majority of them did not complete their primary education.

The majority cases consumed SLT for a long time. This study revealed that SLT could raise the risk of developing cervical cancer. To prevent cervical cancer associated with SLT exposure, women's educational levels must be improved. The adverse consequences of SLT on cervical cancer must be disseminated to women through appropriate means, such as mass media. The obligatory procedures also must be taken to cease SLT manufacture and sales.

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