Awareness on Risk Factors of Oropharyngeal Cancer and Practice of Oral Sex among Students in Kinshasa City: A Pilot Study

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Authors’ contributions

This work was carried out in collaboration among all authors. Author NBF designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Authors SR and KS managed the analyses of the study. Author MMA managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Aims: The present study aimed to estimate the occurrence of oral sex, and the awareness of risk factors of Oropharyngeal cancer to prevent human papillomavirus (HPV)-associated oropharyngeal cancer.

Study design: A prospective cross-sectional analysis was conducted using the 2019 Institut de Technique Medical de Kinshasa (ISTM-KIN) Interview Survey, Democratic Republic of Congo (DRC).

Place and Duration of Study: Participants were enrolled from March 2019 through April of the same year in the Democratic Republic of Congo (DRC), Kinshasa City.

Methodology: Eligibility criteria included both men and women aged 15 to 45 years, enrolled in an educational program, and accepted voluntarily to respond the survey. Demographic data, history of sexual behavior, initiation times, and knowledge about risk factors of oropharyngeal cancer were evaluated. Differences between groups of sexual behavior were tested by chi-square tests and ANOVA test at significant level of 5%.

Results: Out of 1,196 participants, 412 (34.4%) were males and 784 (65.6%) females with an average (±SD) age of 20±2.4 years. A total of 964 respondents reported a history of sexually behavior (81%), of that, 53.1% had performed oral sex, 35.4% had vaginal sex and 11.5% had practiced sodomy. Oral sex was the first sexual activity practiced with a significant difference among sexual behavior (P= .003). The respondents knew that oral sex is a risk factor for OPC (51.5%; n=616).

Conclusion: Oral sex is the first sexual activity performed by students of Kinshasa Nursing School. Therefore, the education program to avoid the risk of HPV-associated oropharyngeal cancers may be necessary.

Keywords: Sexual behaviors; nursing students; oropharyngeal cancer.

1. INTRODUCTION

Oral health knowledge is considered an essential prerequisite for health-related behavior. Oropharyngeal cancer is a type of head and neck cancer that cancer cells are found within the oropharynx area and more than 90% of those cancers are squamous cell carcinomas [1]. The incidence of oropharyngeal cancers (OPC) is increasing significantly in the developed countries [1, 2]. According to the Centers for Disease Control and Prevention (CDC), 11,788 cases of cervical carcinoma and 18,917 cases of OPC were reported in 2015 [3]. Of the aforementioned incidence, the International Agency for Research on Cancer (IARC), estimated the number of several deaths (n=4,195) and 5,088 new cases of OPC in Eastern Africa in 2018 [4]. In Middle Africa, the incidence of OPC was estimated nearly two-fold lower than the worldwide rate (4.5 versus 8.0 per 100,000 new cases/year), while an unexpectedly high incidence of 9.4 was recently reported in Gabon [5]. From the literature, tobacco, alcohol exposure, poor oral hygiene, excessive sunlight exposure, and potentially malignant lesions have long been established as risk factors for OPC [6], however, in recently days there has been an increase in a subset of OPC linked to human papillomavirus (HPV) [7-9]. In the United States and Northern Europe, HPV DNA can now be identified in more than 70% of all new cases of OPC [2, 10]. Affected patients have shown an early onset of sexual activity. The number of oral and vaginal sex partners was higher than those partners affected with HPV-negative OPC and oral sex for open-mouthed kissing [11-13]. Thus, the recent 4th Edition of the World Health Organization (WHO) Classification of Head and Neck Tumors classified OPC based on HPV status [14].

Adequate knowledge of on risk factors of oropharyngeal Cancer may help in the prevention and early detection. The prevalence of oral sex is on the rise. The previous studies found that 20% to 75% of adolescents cases had engaged in heterosexual anal or oral sex. [15]. Oral and anal sexual behaviors remain high in developed countries among adolescents and adults' population reporting heterosexual sex [16,17]. These behaviors are associated with negative health outcomes such as sexually transmitted infections (STIs) [18,19]. In some African countries, data exists on the prevalence of Oral and Anal sex [20], however, in the
Democratic Republic of the Congo, no study has yet focused on this issue. The purpose of the present study was to estimate the occurrence of oral sex, to analyze the awareness of the risk factors for oropharyngeal cancer that could help to implement preventive measure measure to avoid the disease.

2. MATERIALS AND METHODS

2.1 Study Design and Sample

A prospective cross-sectional study was conducted among the students in the Institut de Technique Medical de Kinshasa (ISTM-KIN), located in Kinshasa Capital, Democratic Republic of Congo (DRC). The capacity to receive more than ten thousand students from a different area of DRC and acceptance of personnel team to collaborate with us for collecting data was the reason for this school choice. The study population was a convenience sample of participants of the aforementioned institution. Participants were enrolled from March 2019 through April of the same year. Eligibility criteria included both men and women aged 15 to 45 years, enrolled in an educational program, were present, had accepted explanation about the aims of this study, and accepted voluntarily to respondent the survey. The exclusion criteria was records of respondents that were incomplete or missing and individuals who were diagnosed with oropharyngeal carcinoma at any point of their life. The ISTM-KIN Institutional Review Board approved the study protocol, written informed consent was obtained from all participants, and the study was conducted according to the STROBE guidelines.

2.2 Study Variables

The study variables including demographic information (age, sex, religion, and status of the participant: married or single), history of sexual behavior (sodomy, oral sex, or vaginal sex), initiation times, and knowledge about oral cancer and associated risk factors other than sexual behaviors. The predictor variable was the demographic data, and the primary outcome variable was the occurrence of sexual behaviors and the awareness risk factors of oro-pharyngeal cancer.

2.3 Data Collection

The participants were approached in their various classrooms, and they were informed that their participation was confidential. Among 1197 volunteer students available to participate, 89 were excluded from the study for incomplete items data records, not responding to the survey, and those diagnosed with oropharyngeal carcinoma. A total of 1108 participants was finally reviewed of that 851 were male and 257 female. The survey questionnaire was in French language, adapted from a previous study [21], and contained two items. It was distributed to students at the same time for all classrooms, without any exclusion criteria. The survey was being conducted anonymously. No time limit was imposed for the completion of the questionnaire. In this study, oral sex was defined as a sexual activity that involves stimulating someone's genitals with the tongue or mouth, or as putting mouth or tongue on a man's penis or woman's vagina or genitals. The kissing term was defined as putting a tongue or lip into a man's or woman's mouth. By using the terms anal and oral sex, we refer to these terms for an opposite-sex partner (heterosexual anal or oral sex).

2.4 Statistical Analysis

Data collected were entered into the SPSS version 21 software. Descriptive statistics were used to report the data as frequency distributions, and the mean ± standard deviation was obtained as illustrated using tables. Differences between groups for sexually behavior were tested by chi-square tests for categorical variables and using analysis of variance test for continuous variables at significant level of 5%.

3. RESULTS AND DISCUSSION

3.1 RESULTS

One thousand hundred ninety-seven respondents, 413 (34.5%) were males and 784 (65.5%) were females of which 92% (n=1100) of them were single and 8% (n=96) married. The average (±SD) age of enrolled respondents was 20 (±2.4) years. The demographic and behavioral characteristics of the study population are shown in Table 1. The majority of the respondents had history of sexually behaviors (81%; n=964). Of them, only, 48.5% (n=580) had used a condom during sexual intercourse to prevent sexually transmitted diseases and/or unwanted pregnancy. The remaining (51.5%; n=616) had never used a condom because of the need to experience maximum sexual pleasure.
Table 1. The report questions asked according to demographic data and characteristics of the participants

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total N=1196 (100%)</th>
<th>Males N=412 (34.4%)</th>
<th>Females N= 784 (65.6%)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-20</td>
<td>567 (47.4)</td>
<td>213 (17.8)</td>
<td>354 (29.6)</td>
<td></td>
</tr>
<tr>
<td>21-25</td>
<td>436 (36.5)</td>
<td>134 (11.2)</td>
<td>302 (25.3)</td>
<td></td>
</tr>
<tr>
<td>26-30</td>
<td>119 (9.9)</td>
<td>47 (3.9)</td>
<td>72 (6.)</td>
<td></td>
</tr>
<tr>
<td>&gt;30</td>
<td>74 (6.2)</td>
<td>18 (1.5)</td>
<td>56 (4.7)</td>
<td>.233</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christian</td>
<td>880 (73.6)</td>
<td>260 (21.7)</td>
<td>620 (51.8)</td>
<td></td>
</tr>
<tr>
<td>Islam</td>
<td>32 (2.7)</td>
<td>20 (1.7)</td>
<td>12 (1)</td>
<td>.003</td>
</tr>
<tr>
<td>Other</td>
<td>284 (23.7)</td>
<td>132 (11)</td>
<td>152 (12.7)</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>1100 (92)</td>
<td>359 (30)</td>
<td>741(62)</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>96 (8)</td>
<td>53 ( 4.3)</td>
<td>43 (3.6)</td>
<td>.001</td>
</tr>
<tr>
<td>Had you sexual activity before?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>964 (80.6)</td>
<td>233 (19.5)</td>
<td>731 (61.1)</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>232 (19.4)</td>
<td>179 (15)</td>
<td>53 (4.4)</td>
<td>.001</td>
</tr>
<tr>
<td>During intercourse, had you ever use a condom?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>580 (48.5)</td>
<td>126 (10.5)</td>
<td>454(38)</td>
<td>.589</td>
</tr>
<tr>
<td>None</td>
<td>616 (51.5)</td>
<td>286(23.9)</td>
<td>330 (27.6)</td>
<td></td>
</tr>
<tr>
<td>Had you heard on OPC?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1008 (84.3)</td>
<td>337 (28.2)</td>
<td>671 (56.1)</td>
<td>.001</td>
</tr>
<tr>
<td>None</td>
<td>198 (15.7)</td>
<td>75 (6.3)</td>
<td>113 (9.4)</td>
<td></td>
</tr>
<tr>
<td>Aware of oral sex as a risk factor for OPC?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>616 (51.5)</td>
<td>293 (24.5)</td>
<td>323 (27)</td>
<td>.589</td>
</tr>
<tr>
<td>None</td>
<td>580 (48.5)</td>
<td>119 (10)</td>
<td>461 (38.5)</td>
<td></td>
</tr>
<tr>
<td>Information source about awareness of OPC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lectures</td>
<td>136 (11.1)</td>
<td>59 (4.8)</td>
<td>75 (6.1)</td>
<td></td>
</tr>
<tr>
<td>Newspapers</td>
<td>38 (3.1)</td>
<td>20 (1.6)</td>
<td>18 (1.5)</td>
<td></td>
</tr>
<tr>
<td>Radio</td>
<td>28 (2.3)</td>
<td>8 (0.7)</td>
<td>20 (1.6)</td>
<td></td>
</tr>
<tr>
<td>Television</td>
<td>212 (17.4)</td>
<td>99 (8.1)</td>
<td>113 (9.2)</td>
<td>.016</td>
</tr>
<tr>
<td>Family &amp; Friends</td>
<td>94 (7.6)</td>
<td>56 (4.6)</td>
<td>38 (3.1)</td>
<td></td>
</tr>
<tr>
<td>Dentist/Doctor</td>
<td>204 (16.7)</td>
<td>90 (7.4)</td>
<td>114 (9.3)</td>
<td></td>
</tr>
<tr>
<td>Internet</td>
<td>105 (8.6)</td>
<td>70 (5.7)</td>
<td>35 (2.9)</td>
<td>.116</td>
</tr>
<tr>
<td>Church</td>
<td>44 (3.6)</td>
<td>12 (1)</td>
<td>32 (2.6)</td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>360 (29.5)</td>
<td>120 (9.8)</td>
<td>240 (19.7)</td>
<td></td>
</tr>
</tbody>
</table>
Variables | Total N=1196 (100%) | Males N=412 (34.4%) | Females N= 784 (65.6%) | P-Value
--- | --- | --- | --- | ---
Another risk factor of OPC than oral sex | | | | .624
Poor Oral Hygiene | 227 (18.1) | 98 (7.8) | 129 (10.3) | 
Hereditary factors | 24 (1.9) | 15 (1.2) | 9 (0.7) | 
Chemicals such low quality | 66 (5.3) | 24 (1.9) | 42 (3.4) | 
Cigarette smoking | 160 (12.8) | 68 (5.4) | 92 (7.3) | 
Alcohol consumption | 241 (19.2) | 103 (8.2) | 138 (11) | 
Sun exposure/Radiation | 47 (3.8) | 20 (1.6) | 27 (2.2) | 
Oral infection | 39 (3.1) | 10 (0.8) | 29 (2.3) | 
Mouth sore | 112 (8.9) | 49 (3.9) | 63 (5) | 
Bleeding | 94 (7.5) | 60 (4.8) | 34 (2.7) | 
Poor nutrition | 27 (2.2) | 16 (1.3) | 11 (0.9) | 
Kissing | 215 (17.2) | 45 (3.6) | 170 (13.6) | 

Legend: OPC; oropharyngeal cancers

Table 2. Socio-demographic information of the sexually experienced students about sexual behaviors

| Variables | Total N =964 (100%) | Vaginal sex N=341 (35.4%) | Oral sex N =512 (53.1%) | Sodomy N =111 (11.5%) | P-Value
--- | --- | --- | --- | --- | ---
Age (years) | | | | | .003
15–30 | 867 (92.01) | 307 (31.84) | 483(50.10) | 97 (10.06) | 
>30 | 77 (7.98) | 34 (3.52) | 29 (3.00) | 14 (1.45) | 
Sex | | | | | .248
Male | 352 (36.51) | 105 (10.89) | 189 (19.60) | 58 (6.01) | 
Female | 612 (63.48) | 236 (24.48) | 323 (33.50) | 53 (5.49) | 
Religion | | | | | .005
Christian | 664 (68.88) | 217 (22.51) | 355 (36.82) | 92 (9.54) | 
Islam | 24 (2.49) | 4 (0.41) | 20 (2.07) | 0 (0) | 
Other | 276 (28.63) | 120 (12.44) | 137 (14.21) | 19 (1.79) | 
Marital status | | | | | .004
Single | 912 (94.60) | 310 (32.16) | 497 (51.55) | 105 (10.89) | 
Married | 52 (5.39) | 31 (3.22) | 15 (1.55) | 6(0.62) | 

Table 3. Comparison between frequencies of first sexual activity vs second sexual activity

| Variables | How was your first sexual activity? | P-Value | How was your second sexual activity? | P-Value
--- | --- | --- | --- | ---
Vaginal sex | Yes (Number) | Frequency | | Yes (Number) | Frequency | |
114 | 11.8% | .002 | 227 | 23.5% | 
Oral sex | 419 | 43.5% | | 102 | 10.6% | 
Sodomy | 56 | 5.8% | | 55 | 5.7% | 

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### Table 4. Demographic and behavioral time characteristics

<table>
<thead>
<tr>
<th>How was your lifetime of Sexually behavior?</th>
<th>Total, N (%)</th>
<th>Males, n (%)</th>
<th>Females, n (%)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Open-mouth kissing</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 month to 1 year</td>
<td>17 (7.9)</td>
<td>7 (15.6)</td>
<td>10 (5.9)</td>
<td>.031</td>
</tr>
<tr>
<td>2-5 Years</td>
<td>60 (27.9)</td>
<td>23 (51.1)</td>
<td>37 (21.8)</td>
<td></td>
</tr>
<tr>
<td>5-8 Years</td>
<td>83 (38.6)</td>
<td>11 (24.4)</td>
<td>72 (42.3)</td>
<td></td>
</tr>
<tr>
<td>More than 8 Years</td>
<td>55 (25.6)</td>
<td>4 (8.9)</td>
<td>51 (30)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>215 (100)</td>
<td>45 (100)</td>
<td>170 (100)</td>
<td></td>
</tr>
<tr>
<td><strong>Oral sex partners</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 month to 1 year</td>
<td>63 (12.3)</td>
<td>42 (22.2)</td>
<td>21 (6.5)</td>
<td>.312</td>
</tr>
<tr>
<td>2-5 Years</td>
<td>202 (39.5)</td>
<td>65 (34.4)</td>
<td>137 (42.4)</td>
<td></td>
</tr>
<tr>
<td>5-8 Years</td>
<td>142 (27.7)</td>
<td>43 (22.8)</td>
<td>99 (30.7)</td>
<td></td>
</tr>
<tr>
<td>More than 8 Years</td>
<td>105 (20.5)</td>
<td>39 (20.6)</td>
<td>66 (20.4)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>512 (100)</td>
<td>189 (100)</td>
<td>323 (100)</td>
<td></td>
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<td><strong>Vaginal sex partners</strong></td>
<td></td>
<td></td>
<td></td>
<td>.002</td>
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<tr>
<td>6 month to 1 year</td>
<td>70 (20.5)</td>
<td>47 (44.8)</td>
<td>23 (9.7)</td>
<td></td>
</tr>
<tr>
<td>2-5 Years</td>
<td>62 (18.2)</td>
<td>21 (20)</td>
<td>41 (17.4)</td>
<td></td>
</tr>
<tr>
<td>5-8 Years</td>
<td>98 (28.7)</td>
<td>9 (8.5)</td>
<td>89 (37.7)</td>
<td></td>
</tr>
<tr>
<td>More than 8 Years</td>
<td>111 (32.6)</td>
<td>29 (26.7)</td>
<td>83 (35.2)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>341 (100)</td>
<td>105 (100)</td>
<td>236 (100)</td>
<td></td>
</tr>
<tr>
<td><strong>Sodomy partners</strong></td>
<td></td>
<td></td>
<td></td>
<td>.426</td>
</tr>
<tr>
<td>6 month to 1 year</td>
<td>11 (9.9)</td>
<td>7 (12)</td>
<td>4 (7.5)</td>
<td></td>
</tr>
<tr>
<td>2-5 Years</td>
<td>36 (32.4)</td>
<td>20 (34.5)</td>
<td>16 (30.2)</td>
<td></td>
</tr>
<tr>
<td>5-8 Years</td>
<td>38 (34.2)</td>
<td>19 (32.8)</td>
<td>19 (35.8)</td>
<td></td>
</tr>
<tr>
<td>More than 8 Years</td>
<td>26 (23.4)</td>
<td>12 (20.7)</td>
<td>14 (28.4)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>111 (100)</td>
<td>58 (100)</td>
<td>53 (100)</td>
<td></td>
</tr>
<tr>
<td><strong>Age of sexual initiation, median (IQR)</strong></td>
<td></td>
<td></td>
<td></td>
<td>.532</td>
</tr>
<tr>
<td>Open-mouth kissing</td>
<td>215</td>
<td>15.3 ± 4</td>
<td>16 ± 2</td>
<td></td>
</tr>
<tr>
<td>Oral sex (performing)</td>
<td>512</td>
<td>17.5 ± 5</td>
<td>17 ± 6</td>
<td>.216</td>
</tr>
<tr>
<td>Vaginal sex</td>
<td>341</td>
<td>19 ± 4</td>
<td>17 ± 3</td>
<td>.182</td>
</tr>
</tbody>
</table>
The majority of the respondents (84.3%; n=1008) had heard about oropharyngeal cancer and half of them (51.5%; n=616) knew that oral sex is a risk factor for oropharyngeal cancer. TV was the primary information source for risk factors of oropharyngeal cancer (17.4%; n=212), dentists/doctors (16.7%; n=204) and lectures (11.1%; n=136) respectively. About other oropharyngeal cancer risk factors, alcohol consumption was reported at 19.2% (n=241), poor oral hygiene at 18.1% (n=227) and kissing was reported at 17.2% (n=215) as risk factor.

Out of 81% who was sexually active, 53.1% had performed oral sex, 35.4% had vaginal sex and 11.5% of the respondent had practiced sodomy (Table 2). Comparison between first sexual activity vs second sexual activity was evaluated in Table 3. The result shows that oral sex was the first sexual activity practiced with a significant difference among sexual behavior (P = .003). According to the time frame for sexual behaviors, the respondents showed differences that mostly varied between 2-5 years and 5-8 years (Table4). In addition, the age of sexual initiation for open-mouth kissing, oral sex, and vaginal sexual intercourse was not significantly different.

3.2 DISCUSSION

Adequate knowledge of the risk factors of oropharyngeal cancer may help in the prevention and early detection. National and international guidelines stress the importance of early detection [22]. Public education toward risk factors and symptoms may result in reducing the oral cancer burden on the community and the lack of knowledge in identifying early signs of oropharyngeal cancer may result in ignoring early pre-cancerous lesions. Misconception about risk factors reduces the chance of making intelligent decisions regarding personal habits. The purpose of the present study was to estimate the occurrence of oral sex and to analyze the knowledge of common oropharyngeal cancer risk factors. This is the first study initiated in our country and data from the present research suggested that the majority of the respondents were sexually active (81%), and 53.1% of them practiced oral sex. Oral sex was the first sexual activity practiced with the significant difference among the sexual behaviors vs second sexual activity. Age of sexual behaviors initiation was not significantly different.

Most oropharyngeal cancer may be precluded by preventing some risk factors. Behaviors such as cigarette smoking, alcoholism, and sexual behaviors are perfectly known as the potential risk factors for oropharyngeal cancer. [6, 23, 24]. Increasingly, the prevalence of oral sex is on an upward trajectory. The recent previous studies found that in 75% to 80% of cases, most adolescents are engaged in oral sex [25]. The prevalence of oral sex in the present study (53.1%) was low compared to the developed countries [25, 26], and high compared to other studies in African countries [27,28]. Although oral sex seems less practiced in Africa compared to developed countries; it appears, however, the most predominant sexual activity among the Congolese nursing students. Such practice would be often associated with negative sexual health outcomes. The human papillo-mavirus infection (HPV) has been identified to be a risk factor for oropharyngeal cancer. The infection was seen to be associated with multiple oral sex partners as well as the open-mouthed kissing partners than vaginal sex partners [29,30]. Oral sex behaviors were also associated with the acquisition and transmission of sexually transmitted infections (STIs), including HIV infection, syphilis, gonorrhea, and chlamydia. This provides further support that oral sexual contact in the form of both oral-oral or oral-genital contact may play an important role in the transmission of oral HPV infection. With regards to the present results, future research to link between oral sex and oral HPV infection or oral sex and oropharyngeal cancer in the Democratic Republic of the Congo would be necessary, to determine the incidence of oral HPV infection related to sexual behaviors. The relation between age and sexual behavior is well-documented [31] and confirmed in this study. Younger women are known to engage in higher-risk sexual behavior. The present study has shown that vaginal sex is the second and sodomy not popular sexual activity practiced among the Congolese students. This maybe confirms the African norms [32], that it is less encouraged in many cultures. Indeed, 35.4% of them had practiced vaginal sex, whereas 11.5% had practiced sodomy. More than half of students who participated in the study (51.5%) had never used condoms. The present result was almost similar to other previous findings [33,34]. This makes them prone to contracting sexually aforementioned infections and that may need preventive education to avoid the consequences.

The awareness rate of oropharyngeal cancer among students in this study (52%) was similar to that reported among medical students in
Chennai and Sudan [35,36]. However, the results of the present study were less than reported in previous studies in Nigeria 72% [37], India 86% [38], and Sri Lanka 95% [39]. The primary sources of information on oropharyngeal cancer were television, dentists/doctors, and lectures. Radio, newspapers, church, and the internet were the least used sources of oropharyngeal cancer information among the respondents as reported by other investigators [21].

The present study has some limitations. Our data was based on self-reports. Selection bias may possible with different behaviors between colleges, cities, and associated individual's decision to self-participate in the study.

4. CONCLUSION

Oral sex is the first sexual activity performed by students who had an average age of 20±2.4 SD. Awareness and knowledge on risk factors of oropharyngeal cancer requires a more structured preventive Education program to avoid the repercussion. Further studies to estimate the prevalence of oropharyngeal HPV infection related to sexual behaviors is highly needed.

6. RECOMMENDATION

Public health researchers would consider information about the risks of oral sex in new prevention education programs.

CONSENT

All authors declare that ‘written informed consent was obtained from the patient

ETHICAL APPROVAL

All procedures performed were by the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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APPENDIX

Formulaire d’enquête

Université de Kinshasa, Faculté de Médecine, Ecole Stomatologique

I. Identité du Participant(e)

2. Religion : 1. christianisme, 2. Islam, 3. Autres :

II. Questions

1. Avez-vous déjà eu des relations sexuelles ? : 1. oui ; 2. non
2. Lors du rapport sexuel, utilisez-vous le préservatif ? Oui ou non
3. Avez-vous déjà entendu parler du cancer oro-pharyngée : 1. oui, 2. Non
4. Quelle source d’information étiez-vous au court sur le cancer de la bouche parmi les :
   - livres
   - Conférences
   - Journaux
   - Radio
   - Télévision
   - Famille & amis
   - Dentiste/médecin
   - Internet
   - Maître de conférences
   - Église

5. Avez-vous déjà eu des pratiques des sodomies ? Oui ou non
6. Avez-vous déjà pratiquer de relation oro-sexuelle ? Oui ou non
7. Quel a été le type de votre premier rapport sexuel ? : 1. vaginal, 2. oro-sexuel, 3. sodomie
8. Quel a été le type de votre second rapport sexuel ? : 1. Vaginal, 2. Oro-sexuel, 3. sodomie
9. Depuis combien de temps pratiquez-vous :
   a) le rapport vaginal  b) oro-sexuelle  c) sodomie,
   1. 6 mois à 1 année  1. 6 mois à 1 année  1. 6 mois à 1 année
   2. 1-5 ans  2. 1-5 ans  2. 1-5 ans
   3. 5-8 ans  3. 5-8 ans  3. 5-8 ans

10. Savez-vous aussi que le rapport oro-sexuelle est un facteur de risque du cancer de la bouche ? Oui ou non
11. Lequel de ces facteurs de risque peut aussi entrainer le cancer de la bouche :
   - Mauvaise hygiène bucco-dentaire
   - Facteurs héréditaires
   - Produits chimiques de basse qualité
   - La cigarette
   - Consommation d’alcool
- Exposition/rayonnement solaire
- Infection orale
- Plaie buccale
- Mauvaise nutrition
- S’embrasser bouche à bouche

Fait à Kinshasa, le 18 juillet 2018
Pr. Dr. Fidele Nyimi B

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