Introduction

Human Papillomavirus (HPV) is an epitheliotropic virus capable of infecting the skin and mucous membranes. It is responsible for the most common sexually transmitted infection (STI) in the world. It affects people regardless of gender and age, causing genital warts and cancer. Objective: To evaluate university students’ knowledge of HPV and its relationship with head and neck cancers. Methods: This is a cross-sectional study using an online questionnaire administered to undergraduate students at a public university (n=335). Results: In total, 69.3% of the participants were unaware of the relationship between HPV and head and neck cancers. The chances of knowing about the relationship of HPV with head and neck cancers were significant for participants who knew that HPV could be asymptomatic (OR = 9.9; p = 0.029), that it might cause genital warts in men (OR = 4.0; p = 0.015), and those aged 24 years or older (OR = 1.9; p = 0.021). However, students in the field of health and medicine (OR = 0.419; p = 0.001) were less likely to know about the relationship. Students who knew the relationship between HPV and female genital warts (OR = 0.010) and male genital warts (OR = 0.005) were more likely to understand the viral interaction with oral cancer. Those who were unaware of the population eligible for HPV vaccine (OR = 0.493; p = 0.017) also showed gaps in their knowledge of this relationship. Conclusion: Our findings showed that there were limitations in the knowledge about HPV, its vaccine, and its relationship with head and neck cancers.

Keywords: Knowledge- head and neck neoplasms- mouth neoplasms- HPV- sexually transmitted diseases
The Brazilian population showed a poor knowledge of the possible association between HPV and HNSCC. This includes students in fields other than Health and less than 30% of them recognized this type of neoplasm as a disease that can be caused by HPV (Biselli-Monteiro et al., 2020). Moreover, more than 85% of university students stated that cervical cancer was the only long-term effect of HPV infections (Cirilo et al., 2010) and less than a half knew that it can be orally transmitted (Burlamaqui et al., 2017). Based on this, this study aimed to determine the knowledge of university students, at a Brazilian public university, on HPV and its relationship with head and neck cancers, especially oral cancers. Our findings may have important implications for both future research and for campaigns to expand vaccination coverage.

Materials and Methods

Participants, procedures, and design

A cross-sectional study was conducted between November 2020 and September 2021 with undergraduate students at the Universidade Estadual do Oeste do Paraná, a public higher education institution in the municipality of Francisco Beltrão, Paraná, Brazil. The sample size was calculated using the Open Source Epidemiologic Statistics for Public Health as a basis of the analyses based on previous studies such as He and He (2018) and Rashid, Labani and Das (2016) who reported the knowledge about HPV around 25%. Considering a population of 1500 students enrolled at the time of data collection, we assumed that 25% (±5%) would have knowledge about HPV (HE; HE, 2018) in a model with 95% confidence intervals (d) with a design effect of 1, thus returning a minimum sample of 242 individuals. Students actively enrolled in undergraduate courses were included in this study. Students who had quit their courses, were away on leave of absence or who refused to participate in this research were excluded. Based on these criteria, 1500 students were invited to this study and out of them 335 agreed to participate. The questionnaire was sent individually via e-mails provided and authorized by the academic secretariat of the university and was completed on Google Forms. The questionnaire was structured into two sections containing 40 objectives and three descriptive questions.

The first section of the questionnaire contained questions on the attended undergraduate course, age, gender, ethnicity, monthly income, marital status, parity, age at the onset of sexual activity, sexual intercourse frequency, prevention methods, gynecological examinations, health, and family history of cancer. The second section included two-alternative questions (yes/no) about HPV knowledge, sexual behavior, immunization, and pathologies, including the most commonly known oral cancer (restricted to oral cavity) and also other regions, such as head and neck cancers (comprising the oral cavity, lips, pharynx, larynx, nasal cavity, and thyroid) (Vieira Zanini et al., 2017; Abreu et al., 2018; He, 2018). The second section measured students’ knowledge about these cancers separately.

This study was approved by the Ethics Committee in Research on Human Beings of UNIOESTE (opinion No.: 4,379,963). All participants signed an informed consent form.

Statistical Analyses

The variables were categorized for statistical analysis. The Chi-squared test ($X^2$) was used to evaluate knowledge on the relation between HPV infection and head and neck and oral cancers. A cut-off point of $p<0.20$ was adopted for multivariate analysis. Next, a multivariate logistic regression analysis with Stepwise method was conducted to define the variables influencing knowledge of that relationship, considering $p<0.05$ and CI:95%. Analyses were processed on the Statistical Package for the Social Sciences – SPSS 24.0 and JASP 0.14.1.0.

Results

Out of the 335 participants, the majority were enrolled in Medicine (29%), Nutrition (24.2%), Administration (6%), Economic Sciences (13.7%), Law (9.3%), Geography (3%), Pedagogy (10.8%), and Social Work (4.2%) and most of them were in their first three years of university (73.7%). Participants’ age ranged from 16 to 55 years, with a mean of 23.3 years ($±5.88$); among them 81.2% were single and 18.5% were married or in a stable union. The majority were self-declared white (85.4%), women (74%), and without children (89.9%). Regarding education fields, 53.1% of participants studied Health, 33.1% studied Applied Social Sciences, and 13.7% studied Human Sciences.

Only 7.5% reported no history of sexual activity. Onset of sexual activity was under the age of 18 years in more than 89% of participants. Condom use was the main form of protection reported (62.8%), often combined with other methods (ie. oral contraceptives and Intra Uterine Device (IUD)). Regarding their own health, 89.3% of participants rated their status as good and very good.

As for the participants’ knowledge of the relationship between HPV infection and head and neck cancers, 69.3% were unaware of such a relationship and 34.6% did not know that HPV can cause oral cancer (Table 1). Based on the multivariate analysis, the participants who knew that HPV could be asymptomatic, cause male genital warts, and were 24 years old or older had a higher chance of knowing the viral relation to head and neck cancers by 9.9 ($p=0.029$), 4.0 ($p=0.015$) and 1.9 ($p=0.021$) times (Table 2). On the other hand, students in courses unrelated to Health (AdjOR: 0.419, $p=0.002$), who had sex at least twice a week (AdjOR: 0.471, $p=0.017$), and were unaware of the target audience for the vaccine (AdjOR: 0.222, $p=0.001$) had a lower knowledge of this relationship.

The findings of the relationship between HPV and oral cancer showed that knowledge of the relationship between HPV and female (AdjOR: 3.6, $p=0.010$) and male genital warts (AdjOR: 3.0, $p=0.005$) increased the understanding that HPV is related to oral neoplasms for more than three times (Table 2). Receiving the vaccine (AdjOR:1.8, $p=0.020$) also favorably influenced the understanding of the relationship. However, university students who were unaware of the target audience for the vaccine (AdjOR:
| Variables                                | Knowledge of head and neck cancer | Knowledge of oral cancer |
|------------------------------------------|-----------------------------------|--------------------------|
|                                          | No (n=232)                        | No (n=116)               |
|                                          | Yes (n=103)                       | Yes (n=219)              |
|                                          | P-value                           | P-value                  |
| Gender                                   |                                   |                          |
| Female                                   | 171 (73.7%)                       | 82 (70.7%)               |
|                                          | (74.8%)                           | (75.8%)                  |
| Male                                     | 61 (26.3%)                        | 34 (29.3%)               |
|                                          | (25.2%)                           | (24.2%)                  |
| Ethnicity                                |                                   |                          |
| White                                    | 199 (85.8%)                       | 96 (82.8%)               |
|                                          | (84.5%)                           | (86.8%)                  |
| Other                                    | 33 (14.2%)                        | 20 (17.2%)               |
|                                          | (15.5%)                           | (13.2%)                  |
| Age group                                |                                   |                          |
| Up to 23 years                           | 176 (75.9%)                       | 87 (75.0%)               |
|                                          | (60.2%)                           | (68.9%)                  |
| 24 years or older                        | 56 (24.1%)                        | 29 (25.0%)               |
|                                          | (39.8%)                           | (31.1%)                  |
| Income (n=334) in USD*                   |                                   |                          |
| ≤ 208.7                                  | 12 (5.2%)                         | 6 (5.2%)                 |
|                                          | (8.7%)                            | (6.9%)                   |
| ≥ 417.4                                  | 219 (94.8%)                       | 110 (94.8%)              |
|                                          | (91.3%)                           | (93.1%)                  |
| Marital status                           |                                   |                          |
| Single                                   | 183 (78.9%)                       | 89 (76.7%)               |
|                                          | (86.4%)                           | (83.6%)                  |
| Other                                    | 49 (21.1%)                        | 27 (23.3%)               |
|                                          | (13.6%)                           | (16.4%)                  |
| Offspring                                |                                   |                          |
| No                                       | 212 (91.4%)                       | 105 (90.5%)              |
|                                          | (86.4%)                           | (89.5%)                  |
| Yes                                      | 20 (8.6%)                         | 11 (9.5%)                |
|                                          | (13.6%)                           | (10.5%)                  |
| Undergraduate Course                     |                                   |                          |
| Health                                   | 109 (47.0%)                       | 58 (50.0%)               |
|                                          | (67.0%)                           | (54.8%)                  |
| Other                                    | 123 (53.0%)                       | 58 (50.0%)               |
|                                          | (33.0%)                           | (45.2%)                  |
| Onset of sexual activity (n=330)         |                                   |                          |
| ≤ 18 years old                           | 193 (84.3%)                       | 94 (82.5%)               |
|                                          | (87.1%)                           | (86.6%)                  |
| > 18 years old                           | 36 (15.7%)                        | 20 (17.5%)               |
|                                          | (12.9%)                           | (13.4%)                  |
| Frequency of sexual intercourse           |                                   |                          |
| < 2x a week                              | 163 (70.3%)                       | 83 (71.6%)               |
|                                          | (77.7%)                           | (73.1%)                  |
| ≥ 2x a week                              | 69 (29.7%)                        | 33 (28.4%)               |
|                                          | (22.3%)                           | (26.9%)                  |
| Prevention measures (n=325)              |                                   |                          |
| Not condom                               | 90 (39.8%)                        | 49 (43.0%)               |
|                                          | (31.3%)                           | (34.1%)                  |
| Condom                                   | 136 (60.2%)                       | 65 (57.0%)               |
|                                          | (68.7%)                           | (65.9%)                  |
| Self-rated health                        |                                   |                          |
| Bad/not very good                        | 25 (10.8%)                        | 10 (8.6%)                |
|                                          | (10.7%)                           | (11.9%)                  |
| Good/very good                           | 207 (89.2%)                       | 106 (91.4%)              |
|                                          | (89.3%)                           | (88.1%)                  |
| History of cancer in the family (n=334)  |                                   |                          |
| No                                       | 88 (38.1%)                        | 39 (33.9%)               |
|                                          | (29.1%)                           | (36.1%)                  |
| Yes                                      | 143 (61.9%)                       | 76 (66.1%)               |
|                                          | (70.9%)                           | (63.9%)                  |
| Heard about some STI1 campaign           |                                   |                          |
| No                                       | 11 (4.7%)                         | 3 (2.6%)                 |
|                                          | (5.8%)                            | (6.4%)                   |
| Yes                                      | 221 (95.3%)                       | 113 (97.4%)              |
|                                          | (94.2%)                           | (93.6%)                  |
| Have heard of HPV2                       |                                   |                          |
| No                                       | 10 (4.3%)                         | 6 (5.2%)                 |
|                                          | (1.9%)                            | (2.7%)                   |
| Yes                                      | 222 (95.7%)                       | 110 (94.8%)              |
|                                          | (98.1%)                           | (97.3%)                  |
| HPV is a virus                           |                                   |                          |
| No                                       | 6 (2.6%)                          | 2 (1.7%)                 |
|                                          | (2.6%)                            | (2.7%)                   |
| Yes                                      | 226 (97.4%)                       | 114 (98.3%)              |
|                                          | (98.1%)                           | (97.3%)                  |
| HPV causes an STI                         |                                   |                          |
| No                                       | 8 (3.4%)                          | 6 (5.2%)                 |
|                                          | (0.0%)                            | (2.9%)                   |
| Yes                                      | 224 (96.6%)                       | 110 (94.8%)              |
|                                          | (100%)                            | (99.1%)                  |

Table 1. Analysis and Result of Knowledge on HPV as the Possible Cause of Head and Neck and Oral Cancers in Students at a Public University in the State of Paraná, Brazil.
Table 1. Continued

| Variables | Knowledge of head and neck cancer | Knowledge of oral cancer |
|-----------|----------------------------------|--------------------------|
|           | No (n=232) | Yes (n=103) | P-value | No (n=116) | Yes (n=219) | P-value |
| HPV may be asymptomatic |  |  |  |  |  |  |
| No | 22 (9.5%) | 1 (1.0%) | 0.004<sup>c</sup> | 13 (11.2%) | 10 (4.6%) | 0.039<sup>b</sup> |
| Yes | 210 (90.5%) | 102 (99.0%) | | 103 (88.8%) | 209 (95.4%) |  |
| Causes female genital warts |  |  |  |  |  |  |
| No | 37 (15.9%) | 2 (1.9%) | 0.000<sup>c</sup> | 29 (25.0%) | 10 (4.6%) | 0.000<sup>b</sup> |
| Yes | 195 (84.1%) | 101 (98.1%) | | 87 (75.0%) | 209 (95.4%) |  |
| Causes male genital warts |  |  |  |  |  |  |
| No | 54 (23.3%) | 4 (3.9%) | 0.000<sup>c</sup> | 40 (34.5%) | 19 (8.2%) | 0.000<sup>b</sup> |
| Yes | 178 (76.7%) | 99 (96.1%) | | 76 (65.5%) | 201 (91.8%) |  |
| HPV causes cervical cancer |  |  |  |  |  |  |
| No | 12 (5.2%) | 0 (0.0%) | 0.021<sup>c</sup> | 11 (9.5%) | 1 (0.5%) | 0.000<sup>c</sup> |
| Yes | 220 (94.8%) | 103 (100%) | | 105 (90.5%) | 218 (99.5%) |  |
| HPV may alter pap smear tests (n=334) |  |  |  |  |  |  |
| No | 20 (8.7%) | 3 (2.9%) | 0.062<sup>c</sup> | 11 (9.6%) | 12 (5.5%) | 0.161<sup>a</sup> |
| Yes | 211 (91.3%) | 100 (97.1%) | | 104 (90.4%) | 207 (94.5%) |  |
| HPV and HIV3 are different |  |  |  |  |  |  |
| No | 56 (24.1%) | 15 (14.6%) | 0.048<sup>c</sup> | 28 (24.1%) | 43 (19.6%) | 0.337<sup>a</sup> |
| Yes | 176 (75.9%) | 88 (85.4%) | | 88 (75.9%) | 176 (80.4%) |  |
| There is a relation between HPV and the onset of sexual activity |  |  |  |  |  |  |
| No | 106 (45.7%) | 36 (35.0%) | 0.066<sup>a</sup> | 52 (44.8%) | 90 (41.1%) | 0.511<sup>a</sup> |
| Yes | 126 (54.3%) | 67 (65.0%) | | 64 (55.2%) | 129 (58.9%) |  |
| There is a relation between HPV and number of partners |  |  |  |  |  |  |
| No | 72 (31.0%) | 17 (16.5%) | 0.005<sup>a</sup> | 36 (31.0%) | 53 (24.2%) | 0.178<sup>a</sup> |
| Yes | 160 (69.0%) | 86 (83.5%) | | 80 (69.0%) | 166 (75.8%) |  |
| You think you have already contracted HPV |  |  |  |  |  |  |
| No | 209 (90.1%) | 85 (82.5%) | 0.051<sup>a</sup> | 107 (92.2%) | 187 (85.4%) | 0.100<sup>b</sup> |
| Yes | 23 (9.9%) | 18 (17.5%) | | 9 (7.8%) | 32 (14.6%) |  |
| Condom can protect against HPV |  |  |  |  |  |  |
| No | 10 (4.3%) | 4 (3.9%) | 1.000<sup>c</sup> | 7 (6.0%) | 7 (3.2%) | 0.343<sup>b</sup> |
| Yes | 222 (95.7%) | 99 (96.1%) | | 109 (94.0%) | 212 (96.8%) |  |
| There are vaccines against HPV |  |  |  |  |  |  |
| No | 9 (3.9%) | 1 (1.0%) | 0.294<sup>c</sup> | 6 (5.2%) | 4 (1.8%) | 0.101<sup>c</sup> |
| Yes | 223 (96.1%) | 102 (99.0%) | | 110 (94.8%) | 215 (98.2%) |  |
| Only women can receive the vaccine |  |  |  |  |  |  |
| No | 176 (75.9%) | 84 (81.6%) | 0.249<sup>a</sup> | 90 (77.6%) | 170 (77.6%) | 0.993<sup>a</sup> |
| Yes | 56 (24.1%) | 19 (18.4%) | | 26 (22.4%) | 49 (22.4%) |  |
| SUS4 provides vaccines |  |  |  |  |  |  |
| No | 14 (6.0%) | 1 (1.0%) | 0.044<sup>c</sup> | 12 (10.3%) | 3 (1.4%) | 0.000<sup>c</sup> |
| Yes | 218 (94.0%) | 102 (99.0%) | | 104 (89.7%) | 216 (98.6%) |  |
| Target audience for the vaccine |  |  |  |  |  |  |
| Girls aged from 9 to 14 years old and boys from 11 to 14 years old |  |  |  |  |  |  |
| No | 157 (67.7%) | 93 (90.3%) | 0.000<sup>b</sup> | 73 (62.9%) | 177 (80.8%) | 0.000<sup>b</sup> |
| Yes | 75 (32.3%) | 10 (9.7%) | | 43 (37.1%) | 42 (19.2%) |  |
| Vaccinated against HPV |  |  |  |  |  |  |
| No | 112 (48.3%) | 48 (46.6%) | 0.777<sup>a</sup> | 67 (57.8%) | 93 (42.5%) | 0.008<sup>b</sup> |
| Yes | 120 (51.7%) | 55 (53.4%) | | 49 (42.2%) | 126 (57.5%) |  |
Table 1. Continued

| Variables                          | Knowledge of head and neck cancer | Knowledge of oral cancer |
|-----------------------------------|----------------------------------|--------------------------|
|                                   | No (n=232)                       | Yes (n=103)              | P-value     | No (n=116) | Yes (n=219) | P-value     |
| Willingness to receive the vaccine|                                  |                          |             |            |             |             |
| No                                | 14 (6.0%)                        | 8 (7.8%)                 | 0.725 b     | 7 (6.0%)   | 15 (6.8%)   | 0.956 b     |
| Yes                               | 218 (94.0%)                      | 95 (92.2%)               |             | 109 (94.0%)| 204 (93.2%) |             |
| Vaccine stimulates the onset of sexual activity |                    |                          |             |            |             |             |
| No                                | 226 (97.4%)                      | 98 (95.1%)               | 0.323 c     | 114 (98.3%)| 210 (95.9%) | 0.342 c     |
| Yes                               | 6 (2.6%)                         | 5 (4.9%)                 |             | 2 (1.7%)   | 9 (4.1%)    |             |
| Discusses HPV                     |                                  |                          |             |            |             |             |
| No                                | 146 (63.8%)                      | 60 (58.3%)               | 0.339 a     | 70 (60.9%) | 136 (62.7%) | 0.747 a     |
| Yes                               | 83 (36.2%)                       | 43 (41.7%)               |             | 45 (39.1%) | 81 (37.3%)  |             |

*Brazilian minimum wage, R$ 1,100.00 = $ 208.7 USD, 02/02/2022. 1 STI, Sexually Transmitted Infection; 2 HPV, Human Papilloma Virus; 3 HIV, Human Immunodeficiency Virus; 4 SUS, Unified Health System; a, Pearson’s Chi-Squared test; b, Chi-squared test with Yates’ continuity correction; c, Fisher’s exact test. Source: the authors.

0.493, p=0.017) also showed gaps in their knowledge that HPV may cause oral cancer.

**Discussion**

Brazil has the highest HNSCC incidence rate among South American countries, with an estimated risk of 10.69 new cases per 100,000 men and 3.71 per 100,000 women, the fifth and 13th most frequent causes of neoplasm, among all cancers respectively (Sung et al., 2021). To understand university students’ knowledge of HPV and its relationship with HNSCC, especially oral cancer, we found data indicating that students had gaps in their knowledge of the viral relationship with these neoplasms, a fact already observed in other studies (Luz et al., 2014; Silva et al., 2017a, 2017b; Burlamaqui et al., 2017; Costa et al., 2017; Kifle et al., 2020; Saleem et al., 2021). Some studies have shown university students’ poor knowledge on the relation...
between HPV and related pathologies, regardless of the course attended (Luz et al., 2014; Freitas et al., 2015; Costa et al., 2017; Spindola et al., 2019). In this study, attending an undergraduate course unrelated to health was associated with poorer knowledge of the relation between HPV, HNSCC, and oral cancer. A different result was reported by a study in Kuwait, where medical students had poor knowledge about the link existing between HPV infection and head and neck cancers (Saleem et al., 2021).

Moreover, unawareness of the target audience of HPV-preventive vaccines was associated with a poorer knowledge of the relationship between the virus, HNSCC, and oral cancer. This may interfere with the number of young people vaccinated and, consequently, increase the spread of HPV and the development of complications due to the infection (Viero et al., 2015). On the other hand, students who were immunized against the virus and knew about the gratuity of the vaccine seemed to have a greater understanding of the viral relationship to the emergence of oral cancer. A study conducted on students at the Universidade de Campinas, in São Paulo State, Brazil, showed that after an educational intervention on HPV, vaccination rates increased by 52% and 27% for women and men respectively (Biselli-Monteiro et al., 2020). It showed the positive impact of knowledge, resulted in a conscious choice for vaccination in view of the risks of HPV infection and, consequently, vaccination protection.

About 70% of participants in this research were young people aged up to 23 years old. The results suggested that those aged 24 years or older were more likely to know the relationship between HPV and HNSCC. Other studies also highlighted that more than a half (51%) of university students under 23 years of age and enrolled in the first years of undergraduate courses showed poorer general knowledge on the virus than those over 24 and close to graduation. This shows that the younger the public, the poorer their knowledge of HPV (Silva et al., 2017a; Costa et al., 2020).

Furthermore, sexual behavior and knowledge about the symptoms of the virus may influence the understanding of the relationship between HPV and the investigated neoplasms. Research conducted in African populations showed that the reduction of risky sexual behavior in young people and adolescents was associated with increased knowledge about STIs among them (Badawiet al., 2019). We observed a similar phenomenon since the more individuals know about the virus and its infection, the greater their chances of showing protective attitudes toward it. Opposed to our work and showing worrying results, a survey conducted on female students aged between 16 and 20 years old in the city Ziwayna (Ethiopia) revealed that only 7.8% of them correctly identified risk factors for cancer, such as HPV (3.9%), multiple sexual partners (9.8%) and early onset of sexual intercourse (10.1%) (Kifle et al., 2020). According to Biselli-Monteiro (2020), the knowledge that HPV is most often asymptomatic and can lead to the formation of anogenital and oropharyngeal warts in both men and women increased university students’ chances of better protecting themselves. A similar condition was observed here in which recognizing that HPV is an asymptomatic virus which causes genital warts in both men and women positively influenced knowledge of the viral relationship and the emergence of HNSCCs including oral cancer.

Although protected sexual relationships (i.e. using condom) reduce the risk of HPV infection by up to 70% (Winer et al., 2006; Giraldo et al., 2008), the results highlighted a possible association between the frequency of sexual intercourse and gaps in understanding the relationship between STIs and HNSCC. It is obvious that the higher the frequency of sexual intercourse, the greater the chances of an HPV infection. Therefore, it is important to promote the knowledge about STI prevention (i.e., vaccines and condom use). In fact, preventive measures can decrease manifested HPV symptoms, such as genital warts in both sexes (Abdalla et al., 2017). This suggests that the more individuals know about HPV manifestations, signs, and forms prevention, the better their health outcomes.

Although recognizing the relationship between HPV and cervical cancer is a priority, the findings indicated limitations in the knowledge of the infection caused by HPV and HNSCC and oral cancer. Educational campaigns have the potential to expand and demystify the relationship between HPV and the neoplasms treated in this study.

This study may have had a bias related to the low representativeness of university students in their final years of graduation, which may have led to underestimates students’ knowledge on the subject. Furthermore, there may have been a bias on the part of participants regarding their affinity with the addressed subject, especially among Health students, compared to the others.

Author Contribution Statement

For transparency we inform the contributions of each author to the paper. Valquiria Kulig Vieira works in Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Validation, Visualization, Roles/Writing - original draft, Writing - review & editing. Guilherme Welter Wendt works in Data curation and investigation, Methodology, Formal analysis, Software, Writing - review & editing. Claudicêia Risso Pascootto works in Writing - review & editing. Lirane Elize Defante Ferreto works in Formal analysis, Date curation, Software, Writing - review & editing. And Léia Carolina Lucio works in Conceptualization, Date curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Roles/Writing – original draft, Writing – review & editing.

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Ethics approval
The study was approved by the Research Ethics Committee in Research with Human Beings of the Western Paraná State University (CEP/UNIOESTE), approval number 4,379,963, and the signatures of the participants in an Informed Consent Form were requested.

Conflicts of interest
The authors have no conflict of interests to declare.
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