**Title:** Sociodemographic and general health factor association with high-risk human papilloma virus infection in a prospective study of females residing in Riga, Latvia

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**Introduction**

Although over 90% of high-risk human papillomavirus (hrHPV) infections resolve spontaneously, persistent cases can progress to cervical cancer. Understanding sociodemographic and general health factors associated with hrHPV infection is crucial for targeted cancer prevention, yet data on these correlates is limited in Baltic populations. This study aimed to identify factors associated with hrHPV infection in healthy females residing in Latvia.

**Materials and methods**

Eighty-three females (mean age 42.2 ± 10.1 years) completed an online questionnaire covering sociodemographic data and general health information, followed by a clinical examination and in-depth anamnesis conducted by a gynecologist. The anamnesis gathered reproductive and sexual health history, STI and contraception use, as well as chronic health and lifestyle factors. Cervical smears were analyzed for hrHPV DNA using PCR (Anyplex HPV14, Seegene, South Korea); 19 participants (22.9%) tested hrHPV-positive (HPV(+)). Statistical analysis was performed using Chi-square and Fisher’s exact tests to identify associations with hrHPV status.

**Results**

The majority of participants were married or had stable partners (81.9%, n=68) and children (86.6%, n=71). All had completed secondary education, and 62.7% (n=52) held higher education degrees. Most were employed (91.6%, n=76), though 28.9% reported feeling socially insecure, and only 56.4% were satisfied with their earnings. In contrast to earlier findings, hrHPV positivity was not associated with sociodemographic factors (p>0.05) (Table 1), nor was there a significant difference in hrHPV prevalence between those who did and did not undergo cervical screening (p>0.05). However, hrHPV infection was significantly more prevalent among women who used contraception methods other than condoms or IUDs (p<0.05) and those with limited knowledge of HPV vaccination (p=0.008). Unexpectedly, hrHPV infection was significantly more prevalent in females who reported no diseases or health-disturbing problems, compared to hrHPV(-) (p=0.008). Additionally, participants who had undergone colposcopy or had cervical health issues (e.g., aceto uptake) showed higher hrHPV positivity, aligning with previous findings on hrHPV risk. No significant association was found between hrHPV status and pain-related symptoms such as backache and menstural abnormalities, although HPV(+) women were more likely to have abnormal cervical tissue findings from gynecological exams.

**Conclusions**

hrHPV infection in this cohort was significantly associated with self-reported healthy status, ineffective contraceptive use, history of colposcopy, and unhealthy cervical tissue, as well as a lack of HPV vaccination awareness. These findings highlight the need for preventive education and regular screenings, irrespective of symptoms, to reduce hrHPV prevalence and ultimately lower cervical cancer risk in the general population.

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**Table 1. Association of sociodemographic factors with hrHPV infection**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **hrHPV infection** | |  |
|  | **hrHPV positive** | **hrHPV negative** | **p-value** |
| **Age, years** (mean ± SD) | 39.3 ± 9.9 | 43.1 ± 10.1 | 0.197 |
| **Nationality** | | | |
| Latvian | n=12 (66.7%) | n=44 (68.8 %) | 0.667 |
| Russian | n=4 (22.2 %) | n=11 (17.2 %) |
| Lithuanian | n=0 (0.0%) | n=3 (4.7 %) |
| Ukranian | n=2 (11.1%) | n=3 (4.7 %) |
| Belarusian | n=0 (0.0%) | n=3 (4.7 %) |
| **Higher education** | | | |
| Yes | n=15 (78.9 %) | n=37 (57.8 %) | 0.094 |
| No | n=4 (21.1 %) | n=27 (42.2 %) |
| **Employment** | | | |
| Employed | n=18 (94.7 %) | n=58 (90.6 %) | 1.00 |
| Unemployed | n=1 (5.3 %) | n=6 (9.4 %) |
| **Satisfaction with earnings** | | | |
| Satisfied | n=12 (66.7 %) | n=32 (53.3 %) | 0.317 |
| Not satisfied | n=6 (33.3 %) | n=28 (46.7) |
| **Social protection** | | | |
| Feel socially protected | n=15 (78.9 %) | n=44 (68.8 %) | 0.389 |
| Not socially protected | n=4 (21.1 %) | n=20 (31.2 %) |
| **Number of interrupted pregnancies** (median, (IQR)) | 0 (0-1) | 1 (0-1) | 0.389 |
| **Number of children** (mean ± SD) | 1.6 ± 1.2 | 1.3± 1.0 | 0.285 |