

Religiosity Protects Men from HPV-Driven Head and Neck Cancers: The Oral Sex Antipathy Hypothesis

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ABSTRACT

Among the risk factors for HPV-driven head and neck squamous cell carcinoma (HNSCC) are the higher number of oral-sex or oral-anal sex partners. Thus, in the light of the etiology of HPV-driven HNSCC arising from oral sex, we propose the protective role played by a religious view of sex - one that is purely for procreation within the marital bond and not simply for bodily pleasures. To test our hypothesis, the relationship among the levels of religiosity, the engagement in oral sex, and the development of HPV-driven HNSCC shall be determined using regression-based analyses. It is vital to validate this hypothesis in the Philippines, which may also apply to other countries with

a similar cultural pattern. Given permissive trends, it stands to reason that oral sex, being part of the youth's standard sexual script, may drive the rise of HPV-driven HNSCC in the years to come. Since the engagement in oral sex among adolescents is not without health risk, raising awareness on oral sex as a public and medical health issue is vital. Our recommendations include urgent discussions among policymakers, clinicians, and the public on promoting vaccination of young adults, male or female, against HPV before sexual debut. Further, the Catholic Church should ensure that the sex education programs it offers to the youth must integrate the moral and spiritual aspects of the sexual act with contentious issues on sexuality including the danger and consequences of sexual behaviors such as oral sex.

KEYWORDS

HPV-driven HNSCC, Religion, Sexual Practices, Philippines, Roman Catholic, HPV Vaccine, Vaccination Policy

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Possible Moderating Effects of Religiosity in HPV Transmission in Oral Cancers

Human papillomaviruses (HPV) are a diverse group of circular, double-stranded DNA viruses. They are associated with a spectrum of human diseases from benign papillomas (or warts) to invasive cancer of the cervix, vulva, vagina, penis, anus, and head and neck (Chung & Gillison, 2009; Doorbar, 2007). Over the recent years, there has been an increasing incidence of HPV-driven head and neck squamous cell carcinoma (HNSCC), particularly oropharyngeal and tongue cancers, especially in the more economically developed countries (Chaturvedi et al., 2013; Gillison et al., 2014). Strangely, patients with HPV-positive tumors tend to be young males with no prior history of tobacco and high alcohol consumption (Chung & Gillison, 2009; D'Souza & Dempsey, 2011; Lajer, Buchwald, & von Buchwald, 2010). Based on molecular and epidemiologic studies, it is the changing sexual practices in this demographic sector which may have caused the steady rise in HPV-driven HNSCC (Bosch et al., 2013; D'Souza & Dempsey, 2011; Kjaer et al., 2001; Mirghani et al., 2014).

Most HPV-driven HNSCC arise in the oropharynx, most commonly in the lingual and palatine tonsils or at the base of the tongue (Zandberg et al., 2013). There are some hypotheses on why HPV has such a preference for the tonsils. First, the juxtaposition between the squamous cell epithelium and lymphatic tissue in the tonsils show similar properties with the cervix uteri's squamous-columnar junction. Second, the invaginating crypts in the oropharynx may provide an exposed layer of basal epithelial cells easily accessed by HPV (Kreimer et al., 2005). Consistently, an increased lifetime number of vaginal-sex, oral-sex, or oral-anal sex partners; engagement in casual sex; and early age at first intercourse are among the risk factors for HPV-driven HNSCC, especially oropharyngeal cancers (D'Souza & Dempsey, 2011; Heck et al., 2009; Smith et al., 2004). A higher rate of tonsillar and tongue cancers is also seen among husbands of women with invasive and in situ cervical cancer, further indicating the oral sex connection with HPV (Lajer et al., 2010; Smith et al., 2004). Therefore, these pieces of evidence may support the claim that engaging in oral sex may increase the likelihood or risk of developing HPV-driven HNSCC.

Across the major religious denominations, sexual encounters are considered sacred and a gift from the Supreme Being, and thus, should be exercised within the bounds of marriage. As religion raises moral claims arising from the will of the Divine or the Supernatural, exogamous sexual intercourse is considered sinful and should be punished (Cochran et al., 2004). For its adherents, it can take the form of moral prescriptions or proscriptions to guide them in their everyday choices and commitments, including their sexual attitudes and behaviors (Davidson, Darling, & Norton, 1995; Regnerus, Smith, & Fritsch, 2003; Smith, 2003). Based on studies, religiosity negatively impacts sexual behaviors, such as proclivity to casual hook-ups and early onset of sexual debut (Adamczyk & Hayes, 2012). The influence of religion may also extend to the disposition towards variegated sexual repertoire (Adamczyk, 2012). Thus, the religious are more likely to delay sexual activities, such as touching and oral sex, which are precursors to sexual intercourse (Burdette & Hill, 2009; Regnerus, 2007). Likewise, 'religious' women tend to harbor higher negative attitudes towards non-procreative sexual activities and less likely to receive or give oral stimulations (Davidson et al., 1995; Holway & Hernandez, 2018) in contrast to their 'less religious' counterparts. Moreover, religiosity appears to curb the spread of sexually transmitted infections and associated carcinomas. Kørup et al. (2016) reported that individuals with higher religiosity had lower incidence of sexually transmitted infections such as gonorrhea,

chlamydia, syphilis, and human papillomavirus, thus potentially decreasing the incidence of HPV-related oncologic diseases.

These pieces of evidence, therefore, accentuate the potential direct, positive effect or influence of risky sexual behaviors, such as engagement in oral sex, in the development of HPV and HPV-driven HNSCC. Accordingly, the influence on sexual behaviors and HNSCC etiology provide insights into religiosity's potential moderating effect.

The Oral Sex Antipathy Hypothesis

We advance the hypothesis that among devout Catholics in the Philippines, religiosity moderates the relationship between the propensity to engage in oral sex and the development of HPV-driven HNSCC. That is, the risk of HPV-driven HNSCC decreases as one's religiosity alters the tendency to engage in oral sex. While the hypothesis is contextualized in the Philippines, this phenomenon may bear relevance in other countries with a similar cultural pattern of religiosity. Notably, religion is an immensely powerful socialization agent. Its influence extends to sexual motivations and behaviors of individuals (Regenerus, 2007; Rolston, Schubotz, & Simpson, 2005). It does not only create normative values and beliefs including sanctions but establishes communities that exert social control as well (Deguara, 2019; Esquivel, 2016; Freedman-Doan et al., 2013; Kuhar, 2015). Across many countries, the power of the churches to determine and reproduce sexual morality is historically and culturally established (Hatfield, Luckhurst, & Rapson, 2011; Knill & Preidel, 2015; Rolston et al., 2005; Scott, 1998).

Religiosity is operationally defined here as consisting of three dimensions: organizational religious activity (ORA), non-organizational religious activity (NORA), and intrinsic religiosity (IR). These dimensions involve religious behaviors performed in a group or social setting; behaviors performed alone or in private; and, the subjective or cognitive aspect of religious motivation, respectively (Koenig et al., 2015). The predilection for oral sex consists of whether an individual engages in oral sex, the frequency, and the number of oral sex partners (Dareng et al., 2017).

Testing the Hypothesis

In testing our hypothesis, it is essential to measure the degree of religiosity, the penchant for oral sex among Filipinos, and their likelihood to develop HPV-driven HNSCC. A more macro or global measurement can also be conducted by determining the relationship among the levels of religiosity, the engagement in oral sex, and the development of HPV-driven HNSCC using regression-based analyses, particularly through moderation analysis. It involves determining the effect of a third variable or the moderator (W: religiosity) on the strength or direction of the relationship between the independent variable or exposure (X: the propensity for oral sex) and dependent variable or outcome (Y: development of HPV-driven HNSCC). Evidence suggests that the propensity for oral sex increases the risk of developing HPV-driven HNSCC. However, we hypothesize that one's religiosity may alter this relationship, changing it from a positive to a negative relationship thus, decreasing the development of HPV-driven HNSCC (Hayes & Rockwood, 2017). If this hypothesis is correct, it will lead to lower prevalence and incidence of HPV-driven HNSCC when the Filipino population's religiosity is factored in *ceteris paribus*. There could be other variables such as sexual experience, hygiene, physical discomfort, etc. (Figure 1).

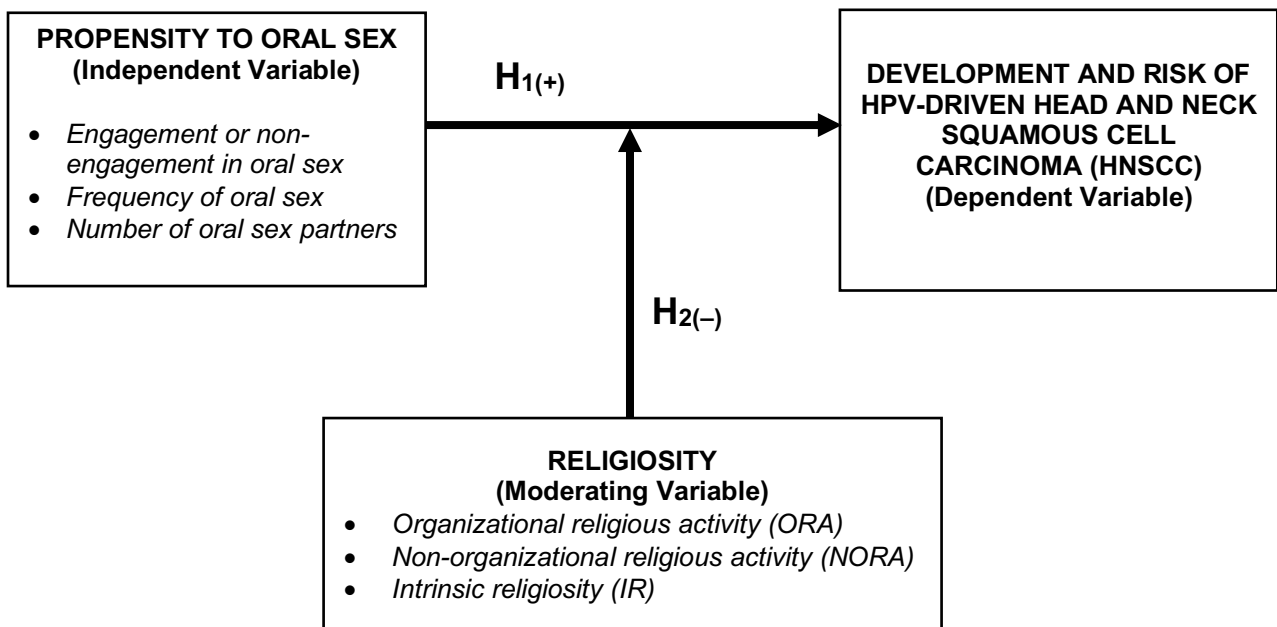


Figure 1: The 'Religiosity-Moderated Model' of the relationship between propensity to oral sex and development or risk of HPV-Driven HNSCC. Evidence suggests that the propensity to oral sex positively affects the development or risk of HPV-driven HNSCC. However, the moderating effect of religiosity negatively alters or changes the relationship.

Viral tell-tale of oral sex and cancer: A case of Roman Catholicism in a rural region in the Philippines

The hypothesis arose from our recently reported low prevalence of HPV in head and neck cancer in the Philippines (Albano et al., 2017). In the paper, the influence of Roman Catholicism, a religion that prohibits oral sex, has been suggested as a possible reason for the low prevalence of HPV among these Filipinos with HNSCC (Albano et al., 2017). Further, the cases in the Philippines were composed of older men (63 y/o median age at diagnosis), the majority of whom did not engage in commercial, casual, and oral sex and had only less than three partners in their lifetime (Albano et al., 2019). The patients came from a region in the Philippines where the population was generally conservative and much bound to the traditional Catholic Church's teachings (Cadorna, 2008).

The 425 years of colonial rule of Spain in the Philippines made Roman Catholicism the dominant religion in the Philippines (Francoeur & Noonan, 1997; Schliesinger, 2015). This religion promotes premarital virginity and marital fidelity, confining vaginal sex within the conjugal relation, and purely for procreation. This view is informed by the long and influential theological and philosophical tradition of the Catholic Church, precisely that of the Augustinian asceticism and the Thomistic natural law theory of morality. The former exhorts the faithful to eschew and dissociate bodily pleasure from the procreative act; otherwise, the sexual act is lustful and, thus, sinful. The latter promotes a teleological view where God prescribed the male and female genitals mainly for procreation and are teleologically bound to each other and not to be used with other human anatomy parts (Davidson et al., 1995; Dimmock & Fisher, 2017). This sexual morality has been deeply ingrained in the consciousness of Filipino boys and girls that consequently, they view oral sex as unnatural (sinful) and dirty (Francoeur & Noonan, 1997; Schliesinger, 2015).

As oral sex contributes to HPV-driven HNSCC, the more the person engages in oral sex, the higher the risk of acquiring HPV-driven HNSCC. Given the health implication of oral sex and the rapidly growing liberal sexual culture, confounded by the declining religiosity and belief in the traditional Filipino social

values, at this time, oral sex is probably part of the standard sexual script of Filipinos, especially the youth in the metropolitan area. It is also expected that unlike in the past and in the rural regions, a significant majority of Filipinos no longer consider oral sex as dirty and unnatural. Consequently, it is reasonable to expect that in the Philippines, HPV-driven HNSCC will rise in the years to come. Thus, it is necessary to have more open and intelligent discussions on oral sex since HPV-driven HNSCCs are predicted to account for most head and neck cancers in the following years (Economopoulou et al., 2019). Unfortunately, there is little attention on oral sex practices among Filipino youth. The only available data on oral sex in the Philippines dates to more than two decades ago (Francoeur & Noonan, 1997).

Further, if the hypothesis is correct, it will underscore the constructive value of adhering to the traditional Roman Catholic sexual norms that may serve to curb the spread of sexually acquired diseases resulting from a highly permissive environment. Further, the decline of Catholicism's influence on the sexual practices of Filipinos, especially the youth, could serve as a barometer for policymakers to come up with more responsive policies. These policies and actions will help protect the youth, especially the sexual minorities – lesbian, gay, and bisexual youth – who are more vulnerable due to higher rates of non-sexual and sexual risk behaviors among their members (Cruz n.d.).

Concluding Remarks and Health Policy Implications

Oral sex has become a normative practice among young adults in the more economically developed countries (Owens et al., 2012). In the Philippines, the Catholic religion seems to prove ineffectual in resisting more permissive alternative outlooks and ways of life that impact the youth's sexual attitudes and behaviors. To provide counterbalance to this permissive trend, Catholic faith-based sex education programs for the youth should move away from the moralistic, sexual intercourse, and "abstinence-only-until-marriage" to more open discussion of homosexuality, sexual desires, variety of sexual practices, and their consequences (Fisher, 2009; Rolston et al., 2005). Notably,

the latter are contentious and disconcerting topics among sex education teachers steep in the Catholic sexual morality (Fisher, 2009). It bears noting that attending a Catholic school is a strong predictor of lack of information on safer sex (Rolston et al., 2005). However, while these topics are passed over in silence, these are the issues that young people find attractive, significant, and relevant to their needs (Rolston et al., 2005). The question, however, is whether the Catholic religion could respond to the challenge through a policy shift that comfortably integrates in its discourse the moral and spiritual aspects of sexual behaviors with the danger and consequences of sexual behaviors including oral sex. Unlike most current sex education programs, this approach could engage young people and would make them more prepared in the world of adulthood (Rolston et al., 2005). In this manner, one's religious education could serve as a protective belt against the spread of HPV-driven HNSCC.

But apart from the role of religion, specifically Catholic religion, public health officials, healthcare professionals, health educators, clinicians, parents, the mass media, and the wider public must acknowledge that engaging in oral sex among adolescents is not without risk. Thus, it is also a public and medical health issue. But clearly, a significant number of adults lack the awareness of the health risks of oral sex, and a more substantial number is confused on ways to protect themselves during oral sex (Chambers, 2007; Holway & Hernandez, 2018). Parents and most religious affiliations are ready and willing to discuss the normative aspects of sexuality with young adults. Still, they are ill-at-ease in providing knowledge on the health risk and the protection needed in oral sex and other forms of sexual behaviors (Burdette & Hill, 2009). Overall, only 27.4% of the young Filipino adults have adequate knowledge about sex; only 9.7% discuss sex in their homes; 36% prefer to consult friends when they have questions about sex; only 27% prefer consulting their mothers; remarkably 22% prefer not to consult anyone (Demographic Research and Development Foundation [DRDF] and [UPPI] 2014). Studies on sexual practices are centered on vaginal intercourse and its negative consequences, while scholarly and systematic attention on oral sex remains scanty and peripheral (Brady & Halpern-Felsher, 2007; Chambers, 2007; Holway & Hernandez, 2018; Newcomer & Udry, 1985). In the Philippines, the latest survey on the sexual attitudes and behaviors of young adults failed to include, at the very least, the occurrence of oral sex among Filipinos (Demographic Research and Development Foundation [DRDF] and [UPPI] 2014).

Given the above, it stands to reason that the incidence of HPV-driven HNSCC secondary to oral sex will rise in the Philippines in the years to come. Thus, a multifaceted approach to this problem is in order. There is a need to update information on Filipinos' sexual behaviors that will go beyond mere documentation of oral sex. Research must capture more nuanced and contextualized experiences that will include the motivation and knowledge of risk factors and the protection which Filipinos employ when giving or receiving oral sex. Further, research should ensure that the categories used to classify the behaviors are ecologically sound (e.g., virgins do not mean sexually inactive).

Sex education services for young people must be comprehensive, not limited to negative consequences of sexual intercourse. They must incorporate accurate and complete information regarding health risks for virgins and non-virgins engaging in oral sex. Given the lack of knowledge and confusion in health risk and protection of young adults relative to oral sex, sex education must start as early as secondary, if not, even at primary school. This approach may include information on the correct use of barrier methods such as dental dams to prevent oral HPV infection and possibly the incidence of HPV-related HNSCC. To add, we recommend that clinical preventive services, such as

screening and counseling, should be offered among adolescents (Halpern-Felsher et al., 2005).

Lastly, since the forward march of open and permissive sexual attitudes and behaviors will continue (MacKay, 2001) and thus further enhance the popularity of oral sex, health policymakers, clinicians, and parents must seriously consider vaccinating young adults male and female before sexual debut. The HPV vaccine is the first intervention available to prevent and control one of the most common sexually transmitted infections and even cancer (Bloem & Ogbuanu, 2017). The Advisory Committee on Immunization Practices (ACIP) has recommended prophylactic HPV vaccination in adolescent boys since 2011 (Yete, Souza, & Saranath, 2018). Therefore, in the absence of religion, HPV vaccination may be the best option for the Filipino youth not to develop HPV-driven HNSCC due to evolving sexual practices.

Conflict of interest

The authors declare no conflict of interest.

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