

# Identification of Sexual Behavior in Community at Risk of Oral Human Papillomavirus Infection

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## ABSTRACT

**Background:** Human Papillomavirus (HPV) is a virus that commonly associated with malignancy in the oral cavity. Most deaths from head and neck cancer are caused by HPV. The virus can infect the oral cavity due to the sexual behavior of male homosexuals.

**Objective:** To identify sexual behavior in communities at risk for HPV infection in the oral cavity based on age, sex, education level, occupation, HIV status, marital status, and social support.

**Method:** This was an observational cross-sectional analytic study conducted in Surabaya with sample criteria of individuals who are homosexuals. Data collection was carried out through questionnaires and patient medical records to see HIV status.

**Results:** There were 70 samples, 53 people having sexual intercourse with the same gender and 17 people having sex with the same gender and the opposite gender. Individuals in this study tended to have good sexual knowledge, supportive attitudes for risky sexual intercourse and high-risk actions when having sexual relations, such as changing partners, not using contraception, doing sex more than once a day and

doing oral and anal sex when having sex. Sex, marital status, HIV status, occupational status, education level, and individual social support contributed to shaping individual behavior during sexual intercourse.

**Conclusion:** There are factors that have a great contribution to form sexual behavior. In this study, occupational status is a one of contributing factor which can form the sexual behavior because, in this study, most of the respondents were sex workers so they had high-risk sexual behavior.

**Keywords:** sexual behavior, homosexuality, HPV infection

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## INTRODUCTION

Human Papillomavirus (HPV) infection is common in individuals who have risky sexual intercourse. HPV may give rise to sexually transmitted infection which is common throughout the world. Some study stated that 79 million people in the United States are infected with HPV and every year there are as many as 14 million new cases for HPV infection.<sup>1</sup> Recent research shows that there are pre-malignant lesions of HPV in the oral cavity due to sexual intercourse, while other studies suggest that patients with a high risk of HPV infection can also be at risk oral cavity infection of HPV which can lead to cancer around the head and neck region.<sup>2</sup>

Patients with a high risk of HPV in Surabaya can be identified due to the sexual intercourse that they had done, such as the oral sex, anal sex or both. People with the high risk of HPV infection can have a risk of developing cancer around the head and neck. A study reported that 38% of patients have oral and oropharyngeal cancer.<sup>2</sup> According to Gillison et al in 2012, the prevalence of HPV infection in the oral cavity was higher in males, i.e 10.1%, compared to females which were only 3.6%.<sup>3,4</sup> According to the Centers for Disease Control Prevention in 2015, men who have sex with the same sex, have a higher risk of Sexually Transmitted Infections (STIs), especially in the oral cavity that has been increasing continuously from 2011 to 2015.<sup>5,6</sup> Some of health promotion attempts to reduce and prevent STIs in communities that at risk of HPV infection in the oral cavity have been carried out, such as examination and treatment of STIs, HPV vaccination, Communication, Information and Education (IEC) against STIs and antiretroviral drugs in homosexual individuals and

individuals who have been infected with HIV/AIDS.<sup>8</sup> However, these efforts still cannot reduce the number of STIs in men sex men (MSM). Based on this description, there is a need for research to identify sexual behavior in communities at risk of infection with the Human Papillomavirus in the oral cavity, namely a community consisting of a group of undiagnosed individuals with HPV infection in the oral cavity but actively engage in sexual intercourse with the same sex. Hence, this study used individuals who reside in several public health centers in Surabaya which have the highest number of individuals that fit the criteria.

## METHODS

This research has been approved by the Health Research Ethical Commission from Faculty of Dental Medicine, Universitas Airlangga, Surabaya, Indonesia, with certificate number of 088/HRECCFODM/VII/2018. This was an analytic observational study with the cross-sectional approach.

The sample were men or women and chosen according to the criteria individuals who were lived in Surabaya and done the sexual intercourse actively with the same gender (oral sex or anal sex or both) The sample was obtained through the community contained in the HIV / AIDS prevention program implemented in the public health center of Surabaya. The study was conducted in 3 public health center based on the highest number that met the criteria. The study begins with the provision of informed consent that had been signed by the subject as an agreement on the action of the subject.

The data were obtained using questionnaire regarding sex, age, occupational status, education level, marital status, social support, sexual behavior and the HPV infection knowledge, the attitude of sexual behavior and the HPV infection. The HIV status was obtained from the medical record at the public health center which showed the results of the rapid test that was done by the public health center using blood from the subject and was done twice to do the confirmatory. The test was done only in twice procedure so there was a false possibility in the results. The statistic analyze was done using linier regression test to identify sexual behavior in communities at risk for HPV infection in the oral cavity based on age, sex, education level, occupation, HIV status, marital status, and social support.

## RESULTS

This study used 70 samples who had met the criteria of having sexual intercourse with the same sex. Table 1 shows that there is a significant correlation between sex and sexual behavior with p value=0.000. It also showed that males have the opportunity 28.687 times higher to have sexual intercourse with the same sex if compared to females. There were more males who had sex with males, but there were also males who had sex with males and females at the same time. Whereas, unmarried individuals tend to have the opportunity to have sex with same-sex by 20,067 times higher when compared to married individuals. There were several males who had married females but also had sex with males. In addition, individuals who had education less than high school tended to have the risk of had sex with the same sex 0.231 times higher compared to the individual who had a high school education level or more.

Based on Table 2, males did oral sex and anal sex more than females. Males used oral sex and anal sex 6,854 times higher than females. Males who had sex with the same sex tended to do sexual intercourse using oral sex. According to this research, respondents who unmarried used oral sex and anal sex 11.480 higher more than married. Besides, respondents with positive HIV used oral sex and anal sex 0.133 times higher than those with negative HIV. Furthermore, respondents who had social support in having sex with the same sex tended to use oral sex and anal sex 10.222 times higher than those who had no social support in having sex with the same sex.

Based on Table 3, males tended to have sex with different partner 17.521 times higher than women. Males were more often to change partner when having sex. Respondents with positive HIV were 0.153 times higher to change partner when having sex than those with negative HIV. According to Table 4, respondents with an education level less than high school were 5.389 times higher to not use a condom when having sex compared to those with the education level of senior high school or more.

Based on Table 5 and Table 6, respondents had known that HPV is a sexually transmitted infection virus and can occur in the oral cavity because of the sexual behavior, such as oral sex and anal sex.

## DISCUSSION

Males tend to have varied ways of having sex, change partners and have more sexual intercourse than women. Most males more often have sexual relations with both sexes and opposite sex when compared to females. Males tend to have high-risk sexual relations, while females have lower risk sexual relations. This high-risk sexual relationship is more often done by males, such as oral sex and anal sex. Males have more sexual relations and have been involved in risky sexual behavior. Males are more likely to have risky sexual intercourse because they think that the risk they get when having sex is much lower than that of females. Some males also tend to have sexual relations with same-sex because attraction with same-sex people is higher when compared to females and the desire of themselves to have sexual relations with fellow males. Sexual relations carried out by females have a greater impact on themselves, such as pregnancy outside of marriage, and this encourages them to have fewer risky sexual relations. Sexual intercourse is risky because it causes a greater impact than normal sexual relations, namely vaginal sex between males and females. Therefore, sex contributes to sexual behavior.<sup>9</sup> Age does not have a correlation with sexual behavior in each individual. **Individual's sexual behavior does not depend on age.** This can occur because the knowledge, attitudes, and actions of individuals when having sex are not related to age.<sup>10</sup>

Education about sex or sexual education is often given to increase individual knowledge about sexual education and determine the attitudes and actions of individuals towards sexual behavior, both at risk and not at risk. However, sexual education is often not found in young people (age <30 years) but there are some teenagers who have received sexual education from their family or school environment. This can make individuals more aware of risky sexual intercourse.<sup>11</sup>

Zuilkowski and Jukes in 2011 stated that there was a correlation between the level of education and sexual behavior.<sup>11</sup> Education can cause women to avoid sexual activity because they know the risks that will be obtained, such as pregnancy outside of marriage. Some individuals have knowledge of sexual relations obtained through sex education provided by their schools which is determined based on the level of education obtained.<sup>10,12</sup>

Some studies suggest that occupation has a meaningful correlation with sexual behavior.<sup>13</sup> **Individual's occupation** can determine the attitudes and behavior of him/her towards sexual intercourse. If individuals have jobs that support them to have risky sexual relations, they can be encouraged to have sexual relations, and tend to act in accordance with the demands of their work. For example, sex workers or transvestites tend to change partners when having sex. This study has respondents who mostly worked as sex workers so that respondents were encouraged to have sex. However, there were some respondents who also did not work as sex workers but had sexual relations with the same sex. This is in accordance with previous research that sexual intercourse by individuals can also occur because of their own desires. Therefore, the occupation does not contribute to determining individual sexual behavior.<sup>14</sup>

Marital status plays a role in sexual behavior. Unmarried individuals or those who decided not to marry tend to have sexual relations freely both with the same sex and with the opposite sex. Likewise, about sexual behavior, unmarried individuals tend to have more sexual intercourse with oral sex and anal sex, do not use contraception and change partners during sexual intercourse when compared to married individuals. This is because unmarried individuals will be supportive of having sexual intercourse with oral sex and anal sex. Besides, they often try to have sexual relations in various ways because they want to try and find out how to have sex that is varied and with different partners. Whereas, for married individuals, they will have sexual relations with their partner so they do not try to find out about other ways of having sex other than what they usually do. Therefore, marital status contributes to sexual behavior used when having sex.<sup>15</sup>

Many people believe that oral sex is not at risk for HIV infection and tends to be safer. This triggers individuals to have sexual intercourse by oral sex as well so that individuals often combine oral sex and anal sex when having sex. Sexual behavior used can also trigger HIV infection in each individual. HIV transmission from one individual to another can easily be done because of this sexual relationship. The more often individuals engage in sexual relations in risky ways, such as anal sex and oral sex, the easier the individual is at risk of being infected with HIV.<sup>16</sup> In addition, people with HIV/AIDS tend to have a low immune system (immunocompromised condition). People with this condition can easily cause the transmission of the virus into the body. The mucosal immune system in the oral cavity also decreases. Therefore, HIV status contributes to sexual behavior used during sexual intercourse.<sup>16</sup>

Individuals who live in social environments who tend to use oral sex and anal sex when having sexual intercourse will be able to encourage other individuals in the environment to have the same sexual intercourse. This happens because individuals feel it is right to do risky sexual behavior since the surrounding social environment supports this. Thus, individuals will engage in risky sexual behavior because perceived sexual behavior by oral sex and anal sex are sexual behaviors that are not at risk for infection with the disease, especially infections due to HPV.<sup>17</sup>

Individuals who have sexual intercourse through oral sex tend to be at risk of being infected with HPV in the oral cavity. HPV is a sexually transmitted infection that may occur in every individual who has sexual relations. Transmission of HPV into the human body can be triggered through the methods used when having sex. Sexual behavior can be very easy to trigger the transmission of HPV into the body through the oral cavity. Therefore, HPV infection in the oral cavity is more common in men than women because of the behavior carried out when having sex with both the same sex and the opposite sex.<sup>14</sup> Individuals who are homosexual tend to do the sexual intercourse with the same gender which is a sexual intercourse that can cause the risk of HIV infection in the oral cavity due to oral sex as well as oral sex and anal sex.

The limitation of this study is this study was not done confirmatory of the HPV infection status on sample. The future study should be obtained the HPV infection status by using saliva or scrapping on oral mucosa to know the infection of HPV in oral mucosa due to oral sex. This study can be used as a basic for creating STI prevention programs, especially infections from HPV and prevent the transmission.

## CONCLUSION

There are factors that have a great contribution to form sexual behavior. Unlike other previous studies, in this study occupational status is a one of contributing factor which can form the sexual behavior because, in this study, most of the respondents were sex workers so they had high-risk sexual behavior.

## CONFLICT OF INTERESTS

No potential conflict of interests declared.

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Table 1: Cross tabulation between characteristics and social support with sexual attraction with same-sex

Variable	Sexual Behavior				p-value	OR	CI
	Homosexual (n)	Homosexual (%)	Bisexual (n)	Bisexual (%)			
Sex							
Male	51	86.4%	8	13.6%	0.000*	28.687	5.221-157.638
Female	2	18.2%	9	81.8%			
Age							
≥30 years old	29	72.5%	11	27.5%	0.471	0.659	0.212-2.045
<30 years old	24	80%	6	20%			
Occupational status							
Employed	41	77.4%	12	22.6%	0.572	0.702	0.206-2.393
Unemployed	12	70.6%	5	29.4%			
Marital Status							
Unmarried	43	93.5%	3	6.5%	0.000*	20.067	4.830-83.368
Married	10	41.7%	14	58.3%			
Education Level							
<senior high school	6	54.5%	5	45.5%	0.034*	0.231	0.060-0.894
≥senior high school	47	79.7%	12	20.3%			
HIV Status							
Positive	15	46.9%	17	53.1%	0.998	0.000	0.000
Negative	38	100%	0	0%			
Social Support							
Supported	44	80%	11	20%	0.117	2.667	0.782-9.089
Unsupported	9	60%	6	40%			

Table 2: Cross tabulation between characteristics and social support with the way of having sex

Variable	Sexual Behavior						p-value	OR	CI
	Oral and Anal Sex (n)	Oral and Anal Sex (%)	Oral Sex (n)	Oral Sex (%)	Anal Sex (n)	Anal Sex (%)			
Sex									
Male	47	79.7%	10	16.9%	2	3.4%	0.006*	6.854	1.720-27.310
Female	4	36.4%	4	36.4%	3	27.3%			
Age									
≥30 years old	28	70%	8	20%	4	10%	0.538	0.710	0.240-2.098
<30 years old	23	76.7%	6	20%	1	3.3%			
Occupational status									
Employed	10	58.8%	3	17.6%	4	23.5%	0.141	0.131	1.334
Unemployed	41	77.4%	11	20.8%	1	1.9%			
Marital Status									
Unmarried	41	89.1%	4	8.7%	1	2.2%	0.000*	11.480	3.345-

Married	10	41.7%	10	41.7%	4	16.7%			39.397
Education Level									
<senior high school	6	54.5%	4	36.4%	1	9.1%	0.146	0.373	0.099-1.411
≥senior high school	45	76.3%	10	16.9%	4	6.8%			
HIV Status									
Positive	47	79.7%	10	16.9%	2	3.4%	0.002*	0.133	0.038-0.464
Negative	4	36.4%	4	36.4%	3	27.3%			
Social Support									
Supported	46	83.6%	7	12.7%	2	3.6%	0.000*	10.222	2.815-37.116
Unsupported	6	33.3%	7	46.7%	3	20%			

Table 3: Cross tabulation between characteristics and social support sexual behavior of changing partner

Variable	Sexual Behavior				p-value	OR	CI
	Changing Partner (n)	Changing Partner (%)	Unchanging Partner (n)	Unchanging Partner (%)			
Sex							
Male	38	64.4%	21	35.6%	0.009*	17.521	2.034-150.954
Female	1	9.1%	10	90.9%			
Age							
≥30 years old	21	52.5%	19	47.5%	0.364	0.622	0.224-1.731
<30 years old	18	60%	12	40%			
Occupational status							
Employed	7	41.2%	10	58.8%	0.237	0.497	0.156-1.581
Unemployed	32	60.4%	21	39.5%			
Marital Status							
Unmarried	28	60.9%	18	39.1%	0.338	1.675	0.584-4.087
Married	11	45.8%	13	54.2%			
Education Level							
<senior high school	7	63.6%	4	36.4%	0.246	2.508	0.531-11.837
≥senior high school	32	54.2%	27	45.8%			
HIV Status							
Positive	10	31.3%	22	68.8%	0.001*	0.153	0.051-0.460
Negative	29	76.3%	9	23.7%			
Social Support							
Supported	30	54.5%	25	45.5%	0.433	0.604	0.172-2.130
Unsupported	9	60%	6	40%			

Table 4: Cross tabulation between characteristics and social support sexual behavior about the use of contraception

Variable	Sexual Behaviour				p-value	OR	CI
	Without condom (n)	Without condom (%)	With condom (n)	With condom (%)			
Sex							
Male	9	15.3%	50	84.7%	0.895	0.895	0.172-4.660
Female	3	27.3%	8	72.7%			
Age							
≥30 years old	6	15%	34	85%	0.436	0.589	0.155-2.236
<30 years old	6	20%	24	80%			
Occupational status							
Employed	4	23.5%	13	76.5%	0.668	1.363	0.331-5.608
Unemployed	8	15.1%	45	84.9%			
Marital Status							
Unmarried	6	13%	40	87%	0.352	0.533	0.142-2.005
Married	6	25%	18	75%			
Education Level							

<senior high school	4	36.4%	7	63.6%	0.044*	5.389	1.046-27.772
≥senior high school	8	13.6%	51	86.4%			
HIV Status							
Positive	8	25%	24	75%	0.488	1.688	0.385-7.400
Negative	4	10.5%	34	89.5%			
Social Support							
Supported	8	14.5%	47	85.5%	0.205	0.383	0.087-1.690
Unsupported	4	26.7%	11	73.7%			

Table 5: Cross-tabulation of characteristics and social support with knowledge about sexual behavior

Variable	Knowledge of Sexual Behavior				p-value	OR	CI
	HPV is a sexually transmitted infection virus (P1)						
	True (n)	True (%)	False (n)	False (%)			
Sex							
Male	43	72.9%	16	27.1%	0.992	1.008	0.237-4.278
Female	8	72.7%	3	27.3%			
Age							
≥30 years old	29	72.5%	11	27.5%	0.948	0.965	0.332-2.807
<30 years old	22	73.3%	8	26.7%			
Occupational status							
Employed	12	70.6%	5	29.4%	0.699	0.641	0.067-6.114
Unemployed	39	73.6%	14	26.4%			
Marital Status							
Unmarried	36	78.3%	10	21.7%	0.357	0.444	0.079-2.503
Married	15	62.5%	9	37.5%			
Education Level							
<senior high school	7	63.6%	4	36.4%	0.963	1.056	0.107-10.440
≥senior high school	44	74.6%	15	25.4%			
HIV Status							
Positive	32	54.2%	27	45.8%	0.176	0.187	0.016-2.124
Negative	6	54.5%	5	45.5%			
Social Support							
Supported	43	78.2%	12	21.8%	0.999	5.161	0.000
Unsupported	8	53.3%	7	46.7%			

Table 6: Cross-tabulation of characteristics and social support with knowledge about sexual behavior

Variable	Knowledge of Sexual Behavior				p-value	OR	CI
	The HPV infection can only occur around the genitals (P4)						
	True (n)	True (%)	False (n)	False (%)			
Sex							
Male	26	44.1%	33	55.9%	0.668	0.850	0.296-2.441
Female	6	54.5%	5	45.5%			
Age							
≥30 years old	22	55%	18	45%	0.131	2.170	0.794-5.930
<30 years old	10	33.3%	20	66.7%			
Occupational status							
Employed	8	47.1%	9	52.9%	0.668	1.363	0.331-5.608
Unemployed	24	45.3%	29	54.7%			
Marital Status							
Unmarried	21	45.7%	25	54.3%	0.352	0.533	0.142-

Married	11	45.8%	13	54.2%			2.005
Education Level							
<senior high school	7	63.6%	4	63.6%	0.054	5.389	1.046-27.772
≥senior high school	32	54.2%	27	86.4%			
HIV Status							
Positive	10	31.3%	22	75%	0.488	1.688	0.385-7.400
Negative	29	76.3%	9	89.5%			
Social Support							
Supported	30	54.5%	25	85.5%	0.205	0.383	0.087-1.690
Unsupported	9	60%	6	73.7%			