

# Husband's Education Level and Alcohol Drinking Habit as Risk Factors of HIV Infection among Housewives in Pati District

## Tingkat Pendidikan dan Kebiasaan Mengonsumsi Alkohol Suami sebagai Faktor Risiko Infeksi HIV pada Ibu Rumah Tangga di Kabupaten Pati

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### Abstract

Cases of Human Immunodeficiency Virus (HIV) infection in Pati District increase, particularly among housewives. The aim of this study was to analyse the risk factors of HIV infection among housewives in Pati District using case-control study design. The respondents were 90 housewives divided into case and control group. The case group consisted of 30 housewives living with HIV, while the control group comprised 60 housewives living in the similar area of the counterparts. The data collection was focused on demographic, sexual behaviour, and sociocultural variables possessed by housewives and their husbands. The study resulted that the risk factors of HIV infection among housewives based on bivariate analysis were housewife's level of education, husband's level of education, husband's occupation, housewife's sexual transmission disease (STD) record, husband's STD record, husband's participation in religious activities, and husband's alcohol drinking habit. The risk factors that fitted to logistic regression model were education level and alcoholic behaviour of husbands that contributed to 29.1% HIV infection among housewives. In conclusion, the husband's variables are proved having stronger and very significant correlation with HIV infection among housewives than housewife's variables.

**Keywords:** Alcohol drinking habit, education level, hiv, husband

### Abstrak

Kasus infeksi HIV di Kabupaten Pati menunjukkan peningkatan khususnya pada kelompok ibu rumah tangga (IRT). Penelitian ini bertujuan menganalisis faktor risiko penularan HIV pada ibu rumah tangga di Kabupaten Pati dengan desain penelitian kasus kontrol. Jumlah responden adalah 90 IRT yang terbagi dalam kelompok kasus dan kelompok kontrol. Kelompok kasus terdiri dari 30 IRT yang terinfeksi HIV, sedangkan kelompok kontrol terdiri dari 60 IRT yang tidak terinfeksi HIV dan tinggal di desa yang sama dengan responden pada kelompok kasus. Pengumpulan data difokuskan pada variabel demografi, perilaku seksual, dan sosial budaya yang melekat pada IRT dan suami. Hasil penelitian menunjukkan bahwa faktor risiko infeksi HIV pada IRT berdasarkan analisis bivariat adalah tingkat pendidikan IRT, tingkat pendidikan suami, pekerjaan suami, riwayat penyakit infeksi menular seksual (IMS) IRT, riwayat IMS suami, partisipasi suami dalam kegiatan keagamaan, dan kebiasaan suami mengonsumsi alkohol. Variabel yang sesuai dengan model regresi logistik adalah tingkat pendidikan suami dan kebiasaan suami mengonsumsi alkohol, dimana kedua variabel memengaruhi 29,1% kasus infeksi HIV pada IRT. Disimpulkan bahwa variabel yang melekat pada suami memiliki signifikansi dan korelasi yang lebih kuat terhadap infeksi HIV dibandingkan kelompok IRT.

**Kata kunci:** Kebiasaan mengonsumsi alkohol, tingkat pendidikan, hiv, suami

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## Introduction

The spreading of Human Immunodeficiency Virus (HIV) infection around the world can be considered as an iceberg phenomenon. United Nation of Acquired Immunodeficiency Syndromes (UNAIDS) revealed that until 2015, the number of people living with HIV reached about 36.7 million people.<sup>1</sup> The efforts to slow down the spread of HIV has been doing massively, but several countries still showed a significant increase of HIV infection. UNAIDS reported that in 2014, the increase of new case of HIV infection in Indonesia reached 48%. It became one of the highest in Asia Pacific.<sup>2</sup> The report from The Ministry of Health report showed that from April 1987 to September 2014, there were 206,095 people living with HIV/AIDS, while the death caused by AIDS reached 9,796 people.<sup>3</sup>

The Ministry of Health revealed that heterosexual intercourse is the main factor of HIV transmission in Indonesia.<sup>3</sup> The number of men living with HIV exceeds the number of women. Interestingly, the rate of new HIV transmission cases among women is higher than that men. In 2008, the ratio of women and men living with HIV was 1:2, while in 2014 that became 7:10.<sup>2</sup> Women are more vulnerable for being infected with HIV compared to men. Ostrach and Singer,<sup>4</sup> mentioned that the vulnerability came from both biological and social factors. Furthermore, that study stated that there is an interconnection between both factors, and even several factors are overlapped, so the explanation of the determining factors of HIV infection among women becomes more complex. Rombo,<sup>5</sup> categorized the risk factors of HIV infection among women into demographic, sexual behavior, and socio-cultural factors. Physically, women are more vulnerable being infected by HIV. The biological processes, including hormonal changes during menstruation, pregnancy, menopause, and hormonal contraception increase the vaginal vulnerability to the development of lesion, which ease HIVs entering woman's body.<sup>4-7</sup>

The social factors, like poverty, indirectly increase the woman's vulnerability to HIV infection. Poverty raises the woman risk acquiring HIV due to lack of access to health care.<sup>4</sup> Another study proved that gender inequality improves the woman's vulnerability to HIV infection.<sup>8</sup> The women being infected with HIV are likely to have a high economic dependency. This situation causes women have lower bargaining position in the households, includes requiring safe sexual behaviors. Among women, housewives are the most vulnerable group for being infected by HIV. Based on the Ministry of Health report, it was estimated that the number of housewives living with HIV was doubled in the period 2011-2014.<sup>1</sup> Until September 2014, the number of housewives living with HIV reached more than 6,500 women and placed them

in the second group with the highest number of HIV infection in Indonesia.

Similar situation was found in Pati District, Central Java. Pati was one of districts in Central Java with the rapid increase of HIV infection. The statistical report from the Health Service mentioned that the number of men living with HIV was higher compared to women and found in all subdistricts. However, during the period 2013-2014, more than 50% newly HIV infection cases were found among women, especially housewives.<sup>9,10</sup> Therefore, housewives became the second highest HIV-infected group following business person group. Interview with a national government organization (NGO) concerning on women living with HIV named *Rumah Matahari* revealed that about 59% women living with HIV, who were supported by *Rumah Matahari*, are housewives.

Regarding those situations, the spread of HIV infection among housewives has become a serious issue. Beijing Declaration and Platform for Action stated that in poor and developing countries, HIV transmission has greater impacts on women compared to men.<sup>11</sup> HIV transmission among women affected the woman's roles, such as parenting, child bearing, and income earning. For instance, if the woman in a household is infected by HIV, the household's economy could collapse, then it influences the quality of life of the rest members'.<sup>12</sup> WHO mentioned that without any intervention, the rate of mother-to-child HIV transmission ranged from 15 to 45%.<sup>13</sup> A study in eight provincial capitals in Indonesia reported that the prevalence of HIV infection among pregnant women was 0.41%. That number was higher than the prevalence in developed countries although far lower than that in African countries.<sup>14</sup> The impacts were worsened since HIV infections were mostly found at the productive age as per reported by the Ministry of Health. It was about 60% people living with HIV were in age ranged of 20-39 years old.<sup>1</sup> While the data from *Rumah Matahari*, reported about 63% women living with HIV aged 21-45 years old. The objective of this study was to examine the demographic, sexual behavior, and sociocultural variables possessed by housewives and husbands that are potentially effect the HIV infection among housewife.

## Method

Using case-control study design, this study was conducted in Pati District. The data were collected during March-August 2015. The number of respondents were 90 women divided into two groups, case and control group. The ratio of the two groups respectively was 1:2. The respondents in the case group were 30 consisting of the housewives living with HIV/AIDS. The naming were given by the NGO *Rumah Matahari*. The control group

comprised of housewives living in similar area with case group respondents of 60 housewives.

This study used both primary and secondary data. The primary data mainly were obtained through interviews using structured questionnaire, while the secondary data were obtained from statistical reports and relevant literature. Most of the housewives from case group did not tell their status. In interview, the data collection was accompanied by the officer from NGO *Rumah Matahari*. However, the interviews with the housewives from the control group were conducted.

This study examined 13 variables, which were categorized into demographics, sexual behaviour, and socio-cultural variables. This categorization refers to the study conducted by Rombo,<sup>5</sup> who categorized the risk factors of HIV infection among women into those three categories. There were three analysis that were used in this study. Univariate analysis was used to describe to respondents' characteristics. The data were displayed using percentage. The second analysis was bivariate analysis using chi square ( $\chi^2$ ) and Fisher's exact tests. This analysis was used to analyse the association between the risk factors and HIV infection among housewives. Furthermore, the strength of the association was shown by the odd ratio (OR). The last one was multivariate

analysis using logistic regression. This analysis was the continuation of bivariate analysis, in which the variables that had critical p value < 0.25 in bivariate analysis were involved in the multivariate analysis. The result of logistic regression was a correlation model that was arranged gradually. The final model consisted of variables that had p value < 0.05.

**Results**

The interviews with the housewives case group revealed that they acquired HIV from their husbands. Most of them realized that they were infected by HIV after their husbands showed the symptoms of AIDS or died due to AIDS. Univariate analysis on the age of housewives showed that those of both groups mostly in their productive age (21-45 years old), where the percentage in the case group was slightly higher than it in the control group. The data from *Rumah Matahari* revealed that the housewives living with HIV were found in all 21 subdistricts of Pati District. The highest number of housewives living with HIV was found in Pati and Kayen (9 cases in each subdistrict). Moreover, in Jaken and Dukuhseti, the number of housewives living with HIV was 8 cases and 7 cases respectively. This result was in line to the data released by the Pati District Health Office that Pati, Kayen,

**Table 1. The Risk Factors of HIV Infection among the Housewives (n=90)**

Variables	Categories	Case		Control		OR	p Value
		n	%	n	%		
<b>Demographic Factors</b>							
Age of housewives	≤ 49 years old	24	80.0	54	90.0	0.44 (0.130 - 1.520)	0.188
	>49 years old	6	20.0	6	10.0		
Age of husbands	≤ 49 years old	21	70.0	47	78.3	0.65 (0.239 - 1.743)	0.586
	>49 years old	9	30.0	13	21.7		
Housewife's education level	≤ 6 <sup>th</sup> grade	19	63.3	19	31.7	3.73 (1.485 - 9.357)	0.004
	> 6 <sup>th</sup> grade	11	36.7	41	68.3		
Husband's education level	≤ 6 <sup>th</sup> grade	23	76.7	23	38.3	5.29 (1.958 - 14.272)	0.001
	> 6 <sup>th</sup> grade	7	23.3	37	61.7		
Income generation activity of housewives	Yes	17	56.7	37	61.7	0.81 (0.334 - 1.98)	0.648
	No	13	43.3	23	38.3		
Husband's occupation	Outside the area	23	76.7	27	45.0	4.02 (1.496 - 10.777)	0.004
	Inside the area	7	23.3	33	55.0		
<b>Sexual behaviour</b>							
Hormonal contraception	Yes	22	73.3	38	63.3	1.60 (0.607 - 4.177)	0.343
	No	8	26.7	22	36.7		
Condom use	Yes	4	13.3	3	5.0	2.93 (0.610 - 14.010)	0.164
	No	26	86.7	57	95.0		
Housewife's record of STDs	Yes	4	13.3	0	0.0	-	0.004
	No	26	86.7	60	100.0		
Husband's record of STDs	Yes	7	23.3	0	0.0	-	0.000
	No	23	76.7	60	100.0		
<b>Socio-cultural factors</b>							
Housewife's participation in religious activities	Yes	18	60.0	38	62.2	0.87 (0.353 - 2.135)	0.758
	No	12	40.0	22	37.8		
Husband's participation in religious activities	Yes	2	6.7	19	23.3	0.15 (0.033 - 0.715)	0.008
	No	28	93.3	41	76.7		
Easiness access to prostitution	Yes	15	50.0	30	50.0	1.000 (0.416 - 2.408)	1.000
	No	15	50.0	30	50.0		
Husband's alcohol drinking habit	Yes	14	46.7	9	15.0	4.96 (1.809 - 13.590)	0.001
	No	16	53.3	51	85.0		

Table 2. The Logistic Regression's Model of HIV Infection among Housewives

Variables	$\beta$	p Value	OR	95% CI
Husband's education level	1.684	0.002	5.385	1.871 – 15.501
Husband's alcohol drinking habit	1.624	0.004	5.072	1.692 – 15.208
Constanta	-4.456	0.001		

Tayu, and Juwana were the subdistricts that significantly contributed to the number of women living with HIV in Pati District.

Bivariate analysis using chi square test was used to examine the correlation between the HIV infections among housewives with the risk factors of HIV infection as the dependent variables. The result of chi square test is presented in Table 1.

The risk factors that belong to demographic factors significantly associated with HIV infection among housewives were the education level of housewives, the education level of husbands, and the occupation of husbands. The OR of those factors were 3.73 (95% CI = 1.958 – 14.272), 5.29 (95% CI = 1.958 – 14.272), and 4.02 (95% CI = 1.96 - 14.27) respectively. The sexual behavior factors related to HIV infection among housewives were housewife's sexual transmission diseases (STDs) record and husband's STDs record. The OR for those variables could not be counted due to the presence of the null-value cells. There were two factors affiliated to sociocultural factors significantly associated with HIV infection among housewives, namely husband's participation in religious activities and husband's alcohol drinking habit with the OR was 0.15 (95% CI = 0.033 - 0.715) and 4.96 (95% CI = 1.809 - 13.590) respectively. The OR of husband's participation in religious activities had OR less than 1, meaning that the OR in control group was bigger compared to that in the case group. Hence, husband's participation in religious activities could be considered as the inhibiting factor of HIV infection among housewives.

The factors having p value < 0.25 were then involved in multivariate analysis using logistic regression. In Table 1, the factors included in logistic regression were housewife's age, housewife's education level, husband's education level, husband's occupation, housewife's income, the use of condom, housewife's STD records, husband's STD records, husband's participation in religious activities, and husband's alcohol drinking habit. The Hosmer and Lameshow Test valued 0.561 (p value > 0.05). It means that there was no difference between empirical and tested data, so the analysis could be continued to the next step. The logistic regression used forward unconditional method and left two variables fitted to the model. The model of logistic regression could predict 73.3% precisely the HIV infection among housewives cases in Pati

District. The strength of the correlation between the two risk factors and HIV infection among housewives was shown by Nagelkerke  $R^2$  valued 0.291. The final model of logistic regression is presented in Table 2.

Based on Table 2, the two variables associated with HIV infection among housewives in Pati District were husband's education level and husband's alcohol drinking habit. The husband's education level had OR 5.38 (95% CI = 1.87-15.50), while the husband's alcohol drinking habit had OR 5.07 (95% CI = 1.692-15.208). Those results meant that the housewives having low-educated husband were likely 5.38 times higher to be infected by HIV compared to those having higher education spouses if only the variable of husbands' alcohol drinking was controlled. Otherwise, the housewives having husbands who used to drinking alcohol were likely to be infected by HIV 5.07 times higher compared to the counterparts if only the variable of education level of spouses was controlled.

## Discussion

From bivariate analysis, the risk factors of HIV infection among housewives in Pati District were housewife's and husband's education levels, husband's occupations, housewife's and husband's records of STDs, husband's participation in religious activities, and husband's alcohol drinking habit. However, there were only two variables fitted to Logistic Regression Model were husband's education level and husband's alcohol drinking habit.

Demographic factors that were significantly proven as the risk factors of HIV infection among housewives in Pati District according to chi-square analysis were housewife's education level, husband's education level, and husband's occupation. In this study, the education level is categorized into lower than the sixth grade and higher than the sixth grade. Univariate analysis showed that the education level of housewives and husbands in the case group were lower compared to the counterparts with the percentage 63.3% and 31.7% respectively. The OR for this factor was 3.73 meaning that the lower education housewives with lower education were likely 3.73 times to get HIV compared to those having higher education.

The examination towards husband's education level showed similar result. The percentage of husbands having lower education in the case group was 76.7%. It was higher compared to that of the control group. The OR

value for the variable was 5.39, meaning that the housewives having lower education husbands tended to be infected by HIV 5.39 times higher than their counterparts. This variable fitted to the model resulted by logistic regression with the OR 5.38 (95% CI = 1.87-15.50).

The correlation between education level and HIV infection among housewives has been proved by previous study in Nepal. Women having migrant husband who did not ever attend school were likely 5.87 times higher to get HIV.<sup>15</sup> Meanwhile, the women who had husband never attending school were likely 5 times higher to get HIV. Quinn and Overbaugh,<sup>6</sup> stated that lower education was one of the roots of women vulnerability toward HIV infection. The education level relates to the knowledge and access to information. The persons with adequate education tend to have more opportunity to access information, so they had knowledge regarding HIV comprehensively. UNAIDS reported that women and girls who attained higher education showed the better sexual and reproductive outcomes. A data analysis from 44 countries showed that women completing secondary education had lower risk of partner violence, particularly in the countries which showed the high rate of spousal abuse. Moreover, the girls with at least six years of school education tend to be more able to protect themselves from HIV infection and other diseases.<sup>16</sup>

The husband's occupation correlated to HIV infection among housewives as well. In this study, most housewives in the case group (76.7%) had husbands working long distance jobs, such as domestic migrants, fishermen, drivers, and international labour/migrants with the percentage. Meanwhile, those in the control group were 55%. This study proved that husband's long distance job increased the risk factor for HIV infection due to the wider possibility to leave the families in a longer period, then committing the unsafe sexual behaviour, like accessing prostitution.

This result was in line with the previous study conducted at Dr. Soetomo Surabaya Public Hospital. According to that study, majority of patients living with HIV had high mobility jobs, such as salesmen, drivers, and, waitresses in cafe.<sup>17</sup> Another study by Johnson and Budlender proved that kinds of informal jobs that obligate the workers to leave their family for a long period, such as mining workers, truck drivers, and security workers had a higher prevalence for getting by HIV than the formal jobs.<sup>18</sup>

STD record correlated with HIV infection among housewives according to bivariate analysis. This study found that 13.3% housewives and 23.3% their husbands had STD's records before living with HIV, while those in both control groups were reported none STD's records. However, OR could not be counted due to the null cells in the control group. The kinds of STDs suffered by

housewives and their spouses were not elaborated in this study. However, the association of STDs and HIV infection has been proved by several previous studies. Generally, STDs may increase the HIV infection due to the presence of genital infection, which effectively becomes an effective entrance for HIV development. Infections caused by STD break the epithelial surface of the genital tract. That may be the entrance for HIV-1 to target cell under the epithelial surface and to build a systemic infection.<sup>19</sup> Moreover, the presence of ulcers in both partner cause blood to blood contact thereby transmission.

Several studies revealed the variation of the odd ratio of the correlation between STDs and HIV infection. Miranda *et al*,<sup>20</sup> reported that the previous sexually transmitted infection (STI) increased the risk of HIV infection (AOR 42.5, 95% CI = 1.89-168.49). Specifically, Johnson and Lewis,<sup>21</sup> revealed that infections in genital tract contribute the largest correlation, in which urethritis with OR 3.1 (95% CI = 1.1-8.6) and Cervicitis with OR 2.7 (95% CI = 1.4-5.2).<sup>21</sup> A study in South Africa finds that the records of syphilis increase 1.86 times the risk of HIV infection among women.<sup>22</sup> Meanwhile, another study in Tanzania reported the higher risk. The women having syphilis record were 9 times likely to be infected by HIV.<sup>23</sup> The infection of syphilis increased the immunity activation of the host, which simultaneously increased the replication of HIV within the cells. Another STD that increase the risk of HIV infection among women is non-ulcerative STDs, like Gonorrhoea and Chlamydia. A meta-study by Rotchford *et al*,<sup>24</sup> stated that gonorrhoea significantly related to HIV infection, while the result was opposite for Chlamydia. However, another study found out that Chlamydia increased 1.8 times the risk factor to HIV infection.<sup>21</sup>

The sociocultural variables that significantly associated with HIV infection among housewives were the husband's participation in religious activities and husband's alcohol drinking habit. The husbands in both case and control group were not active in religious activities. However, the percentage of those in case group was higher (93.3%) compared to that in control group (76.7%). The OR value for this variable was 0.15 (95% CI = 0.033-0.715). The OR was less than 1 proved that husband's participation in religious activities inhibited the HIV infection among housewives. Otherwise, the housewives having husbands who were not active in religious activities tended to get HIV 6 times higher than their counterparts. This result supported previous study by Kagimu *et al*,<sup>25</sup> who proved the correlation between religiosity and HIV risk behavior in Uganda. The respondents who used religion identity and committed to religious activities continuously prone to avoid risky sexual activities, drug abuse, and alcohol drinking habit.

Moreover, religiosity increased the life satisfaction and marriage commitment, so that it may inhibit HIV risk behaviors. The other study by Ludema *et al*,<sup>26</sup> proved that participation in religious activities, such as reading and learning holy book and the faith to God was a strong barrier for sexual behaviors.<sup>26</sup> Furthermore, this study also reported that women having a high level of religiosity and spirituality tended to look for partners whose equal qualities to them, in which their partner had a low risk factor of getting HIV as well.

The husband's alcohol drinking habit significantly related to HIV infection among housewives. This study reported that the husband's alcohol drinking habit found in both case and control group, and the case group's percentage was higher (46.7%) than that of the control group (15%). The OR value was 4.96, meaning that the housewives having husbands with alcohol drinking habit were likely 4.96 times higher to get HIV than those without alcohol drinking habit. Furthermore, the logistic regression test resulted that this variable together with the husbands' education level fitted to the regression model with the OR 5.072 (95% CI = 1.692-15.208). It meant that both variables simultaneously increased the risk for HIV infection among housewives. However, if the husbands' education level was controlled, the risk value of alcohol drinking habit variable was 5.07. The alcohol consumption did not directly increase the risk for HIV transmission. It increased the prevalence of committing sexual risk behavior that directly related to HIV transmission.

The relation of alcohol consumption to HIV transmission has been reported by several previous studies. Baliunas *et al*,<sup>27</sup> proved that 87% alcohol drinker group committed sexual risk behavior and 77% of them got HIV. Another study in Peru by Maguina *et al*,<sup>28</sup> reported that alcohol consumption by both partners increased the prevalence of sexual risk behavior 1.15 times higher. The consumption by the only one partner increased 1.14 times higher the risk for HIV transmission.

### Conclusion

Bivariate analysis resulted that the risk factors for HIV infection among housewives in Pati are housewife's STD records, husband's STD records, husband's participation in religious activities; and husband's alcohol drinking habit. Moreover, logistic regression left two variables fitted to the model, namely husband's education level and husbands' alcohol drinking habit. Both factors simultaneously contribute to 29.1% HIV infection among housewives in Pati District. Furthermore, the regression model is 73.3% accurately predicted the HIV infection cases among housewives in the study area. In conclusion, the variables that belong to husband had stronger contribution to HIV infection among housewives.

### Recommendation

The efforts to slow down HIV infections among housewives in Pati District should consider the economic and sociocultural factors of communities. The awareness regarding HIV infection/AIDS should be raised to the groups having higher risks of HIV infection, particularly in the areas dominated by husbands having long-distant jobs and alcoholic drinking habit. Then, the promotion of HIV/AIDS knowledge should be focused on the lower education housewives. The voluntary counselling and testing for HIV should be encouraged among couples that are proven suffering from STDs. The last, the communities should take part in these efforts through the increase of religious activities involving husbands to hamper the spread of HIV infections among housewives.

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