Risk factors for HIV among prostituted men in Chiang Mai, Thailand

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Abstract

Background: Prostituted people are over-represented among the world’s HIV-infected and prostituted men belong to a particularly vulnerable risk group.

Objective: To investigate socio-economic, socio-demographic and behavioral risk factors for HIV among prostituted men in Chiang Mai, Thailand.

Method: A case-control study with 68 participants; 12 cases and 56 controls, was conducted. Data was collected using an internet-based questionnaire with nine questions about education, income, marital status, age, condom use, sexual orientation, alcohol, drugs and physical violence. Statistical analyses included chi-square tests and bivariate and multivariate logistic regression.

Results: Compared with the control group, the HIV-infected participants were more educated, used a condom with paying customers more seldom, were more often homosexuals/bisexuals and had more often experienced physical violence. After adjustment for age and income, the study found that low education decreased the risk for HIV (OR 0.067), lack of condom use increased the risk (OR 7.897), as well as homosexuality/bisexuality (OR 10.875) and experience of physical violence (OR 6.590).

Conclusions: High education, lack of condom use, homosexuality, bisexuality and experience of physical violence were associated with HIV infection. More research is needed to understand the connection between high education and HIV among prostituted men in Chiang Mai, Thailand. Furthermore, more wide-ranging studies are needed to investigate the variables that were not found to be correlated with HIV in the present study.

Key words

Case-control study, HIV-related risk behaviors, Sex industry, Socio-demographic factors, Socio-economic factors
**Abstrakt**

**Bakgrund:** Prostituerade personer är överreprenterade bland världens HIV-drabbade och prostituerade män tillhör en särskilt utsatt riskgrupp.

**Syfte:** Att undersöka socioekonomiska, sociodemografiska och beteendemässiga riskfaktorer för HIV bland prostituerade män i Chiang Mai, Thailand.

**Metod:** En fall-kontroll studie med 68 deltagare, 12 fall och 56 kontroller, genomfördes. Data samlades in med hjälp av ett internet-baserat frågeformulär med nio frågor om utbildning, inkomst, civilstånd, ålder, kondomanvändning, sexuell orientering, alkohol, droger och fysiskt våld. Statistiska analyser inkluderade chi-tvåtest och bivariat samt multivariat logistisk regression.

**Resultat:** Jämfört med kontrollgruppen var de HIV-smittade deltagarna högre utbildade, använde kondom med betalande kunder mer sällan, var oftare homosexuella/bisexuella och hade oftare upplevt fysiskt våld. Efter kontroll för ålder och inkomst fann studien att låg utbildning minskade risken för HIV (OR 0.067), bristande kondomanvändning ökade risken (OR 7.897), liksom homosexualitet/bisexualitet (OR 10.875), samt upplevelse av fysiskt våld (OR 6.590).

**Slutsats:** Hög utbildning, bristande kondomanvändning, homosexualitet, bisexualitet och upplevelse av fysiskt våld var associerat med HIV-infection. Mer forskning behövs för att förstå sambandet mellan hög utbildning och HIV bland prostituerade män i Chiang Mai, Thailand. Dessutom behövs mer utförliga studier för att undersöka de variabler som inte visade sig vara korrelerade med HIV i den aktuella studien.

**Nyckelord**

*Fall-kontrollstudie, HIV-relaterade riskbeteenden, Sexindustri, Socio-demografiska faktorer, Socio-ekonomiska faktorer*
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Background

In 2017 around 36.9 million people were infected with HIV all over the world (UNAIDS, 2018). Prostituted people make up a particularly vulnerable group with a prevalence that is 12 times higher than for the rest of the population (UNAIDS, 2014). This is to be considered a big public health problem (Luo et al., 2015). In addition, more male than female prostitutes are infected with the disease (UNAIDS, 2014).

In Thailand, around 240,000 men over 15 years live with HIV (UNAIDS, 2015). Prostituted men are over-represented among the infected (AVERT, 2018) and around 12% of them live with HIV (UNAIDS, 2015). In Chiang Mai, in the north of Thailand, prostitution among men is an extensive concern (Urban Light, 2018). This is despite the fact that prostitution is illegal in Thailand (Thai Constitution, 1996).

Men who have sex with men belong to one of the biggest risk groups when it comes to HIV-infection (UNAIDS, 2018) and it is considered to be an epidemic (Luo et al., 2015). Prostituted men within this group are extremely vulnerable (UNAIDS, 2014). The reason is that they often have more sexual contacts, which in itself is a risk factor for HIV, because of the risks of anal intercourse (Smith et al., 2015). Research about HIV among prostituted men is very limited and many publications put this group as a sub-category to other groups, such as “men who have sex with men”, “transgender women”, or even “prostituted women” (Baral et al., 2015). Historically, prostitution among men has been seen as either effeminate or the phenomenon has not been distinguished from homosexuality (Minichiello, Scott & Collander, 2013). Prostituted men are harder to reach in intervention campaigns compared with women (Fournet et al., 2016). Commercial sex among men is more stigmatized, less socially accepted and often more hidden (Baral et al., 2015).

Risk factors for HIV

A risk factor is an exposure or a characteristic that increases the probability of developing a disease or condition (World Health Organization, 2018). This study focused on three main groups of risk factors, namely socio-economic, socio-demographic and behavioral risk factors. Many socio-economic factors, like poverty,
and socio-demographic factors, like age, have been shown to increase the risk for HIV (Fawzi et al., 2010; Alvarez-Uria, Midde & Naik, 2012). There are many various behavioral risk factors for HIV and most of them have to do with sexual risk behaviors, such as unprotected sex and several sex partners (Koblin et al., 2006). Moreover, people who are infected with other sexually transmitted diseases have a higher probability of also being HIV infected (Braunstein et al., 2011). This was however not investigated in the current study because of the problems of measuring this without a physical examination.

**Socio-economic factors**

Many studies of prostituted women show a relationship between low socioeconomic status, such as low education and low income, and an increased risk for HIV infection. Vandepitte et al. (2011) found that “no education” compared with “higher education than elementary school” increases the risk for HIV with more than 300 percent. A study performed in South Africa showed that prostituted women who have not completed their high school education have a 2.8 times higher risk of having an HIV infection compared with prostituted women who have completed this level of education (Coetzee, Jewkes & Gray, 2017). In a study in Ukraine by Iakunchkova and Burlaka (2017) the risk for HIV among prostituted women was 1.45 times higher in the lowest income group compared with the middle group, which was the reference group. This is confirmed in studies of prostituted men, even if these studies are fewer in number (Scheibe, Kanyemba, Syvertsen, Adebajo & Baral, 2014).

There is an association between low education, low income and low social position (Marmot, 2006). These factors can, among other things, lead to more unsafe sexual behaviors (World Food Programme, 2006). Social position depends on relative education and income and results in a health gradient between poor and rich people (Wilkinson, 2005). Low social position is related to poor health, for example through reducing the ability to control stress factors in life, and longstanding stress leads to impaired health (Marmot, 2006). Barnett and Weston (2008) explain the health gradient for HIV infection by saying that low education, low income and low social position affect people’s experience of hope for the future, which has implications for HIV.
**Socio-demographic factors**

Marital status is related to HIV risk and studies of prostituted women show that people who are divorced or widowed are at higher risk (Braunstein et al., 2011). Medhi et al. (2012) found that widows have a 2.62 times higher risk for HIV compared with unmarried women and to be divorced also increases the risk. Good social relationships and good marriages are protective factors against diseases (Wilkinson, 2005). Lack of social relationships leads to a deteriorated immune defense system in the body (Marmot, 2006). Many studies have found that social support, in form of a partner, decreases the risk for HIV-related risk behaviors (Qiao, Li & Stanton, 2014).

Age is a factor where normally a positive association with HIV is seen among prostituted women, probably because older age means a longer exposure to risk factors (Iakunchykova & Burlaka, 2017; Nguyen et al., 2009). This is also the case in the study by Luo et al. (2015) who found that prostituted men over 30 years have a small increased risk of 5.5 percent compared with men under the age of 20. Fournet et al. (2016) found on the contrary that the risk for HIV increases with decreased age and the risk is biggest in the group 25-34 years (OR 2.74), compared with the reference group “over 35 years”.

**HIV-related risk behaviors**

Some of the individual risk factors for HIV among men who have sex with men are the same for prostituted men, for example unprotected intercourse (Baral et al., 2015). It is well known that condom use is a protective factor against HIV and should be encouraged in all HIV prevention (UNAIDS, 2016). However, several studies show no significant association between HIV and condom use among prostituted people (Niama et al., 2017; Wang et al., 2009; Vandepitte et al., 2011).

Alcohol and drugs are well-known risk factors for HIV in general (Pitpitian et al., 2013; Deren, Naegle, Hagan & Ompad, 2017) and also among prostituted men (Miller, Klotz & Eckholdt, 1998; Scott et al., 2005). The reason is that alcohol and drugs make it more likely for people to make bad decisions and adopt a risky sexual behavior (National Institute on Drug Abuse, 2015). The results of studies of prostituted people are however not always clear. Nguyen et al., (2009) found for example a very strong association between drug use and HIV among prostituted women in Vietnam with
odds ratio of 87.3, while a study of prostituted men in the Netherlands did not find any significant association between drugs and HIV at all (Fournet et al., 2016).

Experience of violence has been found to increase the risk for HIV infection among prostituted men (Baral et al., 2015). Violence against prostituted people is for example related to decreased condom use and thereby an increased risk for HIV (World Health Organization, 2005).

Sexual orientation has been shown to influence the risk for HIV infection among prostituted men. Homosexual and bisexual men are at higher risk compared with heterosexual men (Boles & Elifson, 1994). The study by Fournet et al. (2016) showed that the risk for HIV among homosexual and bisexual men is 24.4 times higher compared with heterosexual men. One explanation of this association could be that homosexual and bisexual men generally have a more risky sexual behavior than heterosexual men (AVERT, 2019a).

**Definitions**

*Prostituted person*

In this study the term "prostituted person" was used consistently for people who are bought by others for the purpose of sex. These people are forced into prostitution by different reasons, for example inequality and poverty (MacKinnon, 2011). If we use the word "prostitute" solely we miss the social context that often force people to end up in prostitution (Waltman, 2014).

Some organizations use the term "sex worker" instead of prostituted person. The World Health Organization defines a sex worker as a person who, in exchange for money or goods, offers sex, and who defines these services as profitable (Overs, 2002). There are however disadvantages with this term. One risk is that sex work could be perceived as a job similar to any other kind of job, which is chosen and voluntary (Gerassi, 2015). Some countries that have adopted the "sex work term" strive for example for decriminalization of the sex industry and its actors (MacKinnon, 2011). The drawbacks surrounding the term “sex worker” made it an undesirable choice in this study.
There are other terms that are used to describe people who sell sex. One example is *sex trade worker* (Bird, Lemstra, Rogers & Moraros, 2016). Among prostituted men, local words are often used instead, and there are probably many men who sell sex but call it something else because of the strong stigmatization (Baral et al., 2015).

**HIV**

HIV, or human immunodeficiency virus, is a virus that attacks the immune system in the body and destroys the white blood cells, called T-helper cell (AVERT, 2019b). This means it gets harder and harder for the body to defend itself from infections and illnesses, if the sick person does not get antiretroviral treatment. Untreated HIV can lead to AIDS. The virus can be transmitted through blood, vaginal and anal fluids, semen and breast milk.

**Problem formulation**

Research about HIV among prostituted men is limited (Baral et al., 2015). This is unfortunate when so many men who sell sex are infected with HIV, more than among prostituted women (UNAIDS, 2014). Furthermore, many studies of prostituted men have not investigated the majority of the today known risk factors for HIV, as has been done for prostituted women (Fournet et al., 2016). Most research of prostituted men is also done in the 1990s and 2000s (Verhaegh-Haasnoot, Dukers-Muijrs & Hoebe, 2015) and further research is needed to create effective HIV prevention interventions in the future (Aunon et al., 2015).

Thailand, where this study was performed, is an interesting context to investigate since prostitution is an extensive concern in the country (The Nation, 2018) and the HIV prevalence among prostituted men in Thailand is very high (UNAIDS, 2015).
Objective
The objective of this study was to investigate risk factors for HIV among prostituted men in Chiang Mai, Thailand.

Specific research questions
Which socio-economic factors are associated with HIV?
Which socio-demographic factors are associated with HIV?
Which risk behaviors are associated with HIV?

Method

Study design
The study design used in this study was quantitative survey-based case-control study. Quantitative method was used to draw numeric generalizations from a sample of the population to the whole population (Creswell, 2014).

The case-control design was a retrospective case-control study, which covers time that has already passed. The study consisted of a case group, with people who had HIV, and a control group, with people who did not have HIV (Ejlertsson, 2012). The exposure of the cause was compared between the two groups (Bonita, Beaglehole & Kjellström, 2010). The case-control method was chosen because it increases the chance of finding relationships and is helpful when you want to study several exposure factors at the same time, which was the purpose of this study (Andersson, 2006).

Study material
The cases and controls were recruited from the population of prostituted men in Chiang Mai, Thailand. The cases and controls had the same chance of being included in the study (Rothman, 2002). Moreover, the controls looked like the cases as much as possible, except for the disease (Bonita et al., 2010). The cases and controls were not matched since you cannot match for factors that you want to study (Andersson, 2006).
This study investigated several different risk factors for HIV and therefore the cases and controls could not be matched, since that would result in overmatching.

The cases and controls were derived from the clients of two organizations, namely Urban Light and Caremat. Urban Light reaches out to prostituted men in Chiang Mai and during the last eight years they have been able to help around 5,000 people (Urban Light, 2018). The organization is built around eight pillars; health, employment, housing, education, harm reduction, prevention, outreach and legal support. They run a center in the city with many activities and they also do weekly visits at sex bars, massage parlors and other locations where prostitution is present. Caremat, an organization with funding from many big international organizations, is specialized in HIV testing and treatment (Caremat, n. d.). They reach out to men who have sex with men and transgender women. They run a center where they do health check-ups, HIV-testing, HIV treatment and counseling sessions. They also have a portable clinic, which they set up at different locations in the city. The cases and controls were found either at the organizations’ centers, clinics or at different places where the participants live and work.

The inclusion criterions were the following: the participant had sold sex (in exchange for money or goods) at least one time in the last six months, was between 18 and 45 years old and could speak and understand Thai. The cases were chosen through self-reported HIV status.

The original goal was to find approximately 20 cases and 55 controls. It was however harder than expected to find cases, which resulted in 12 included cases and 56 controls. The recruitment of participants continued until no more cases could be found and the ratio between cases and controls were at least 1:4. According to Hennessey, Bilker, Berlin & Strom (1999), a ratio of at least four controls per case is a good ambition in order to accomplish statistical power in a case-control study. This is especially important when the cases are few (Andersson, 2006). The method for selecting the control series was similar to neighborhood controls, which means that the controls were recruited from the same geographic area as the cases but there was no random sampling (Rothman, 2002).
No one declined to participate and there were no missing answers at specific questions in the questionnaire.

**Data collection**

Data was collected using a questionnaire, created in the online survey tool Survey Monkey ([https://www.surveymonkey.com](https://www.surveymonkey.com)). The choice of a survey depended on the fact that it is relatively cheap and it has the advantages of capturing attitudes, behaviors and characteristics in the study population (Rothman, 2002). The questionnaire was designed in close communication with the staff at Urban Light and Caremat. Their invaluable knowledge of the Thai culture and the target group helped in formulating the questions. With their help, some questions had to be clarified to avoid misunderstandings. Moreover, the staff had input on the letter of information and consent and they also did the translation from English to Thai. Before the questionnaire was used, a pilot study took place where a handful of young men got to answer the questions and give their feedback. That also led to some revising of the inquiry sheet. Before the start of the data collection, all participating staff at Urban Light and Caremat was informed about the process of the survey.

The participants were asked to fill in the questionnaire on a tablet, administered by the staff from Urban Light and Caremat. Before they started to fill out the form they were given a letter of information and consent in Thai, concerning the reason for the study, the storage of data for a possible future study, the characteristics of the participants, the survey questions, the time needed to complete the survey, the compensation and contact info. The data collection was performed during 5 weeks. Both the survey questions and the letter of information and consent can be found in Appendix 1 and 2. Appendix 3 consists of a Thai translation of the letter.

**Measures**

In this study, the following variables were studied: age, education level, marital status, frequency of condom use, sexual orientation, frequency of drug use, income per month, frequency of alcohol use and experience of physical violence. All the variables were dichotomized by using either median split or intentional grouping, in order to answer the research questions. Median split was used to turn the variables into one
lower and one higher group (Ejlertsson, 2012). This was done because the number of responses was relatively small.

The variables were dichotomized as 0 = reference and 1 = risk, as follows:

- **Education level**: “Completed middle school or higher education” (0) and “Completed elementary school or lower education” (1).
- **Income per month**: “More than 10,000 baht” (0) and “Less than 10,000 baht” (1).
- **Marital status**: “Have a partner” (0) (married or currently having a steady partner) and “Have no partner” (1) (single, divorced/separated or widower).
- **Age**: “18-27 years” (0) and “28-42 years” (1).
- **Frequency of condom use with paying customers**: “Always” (0) and “Rarely or often” (1) (never, rarely, half of the time or most of the time, but not always).
- **Self-defined sexual orientation**: “Heterosexual” (0) and “Homosexual, bisexual or unsure” (1).
- **Drug use in the last six months**: “No” (0) and “Yes” (1).
- **Frequency of alcohol use**: “Never or sometimes” (0) and “Often or daily” (1).
- **Exposure to physical violence in the last six months**: “No” (0) and “Yes” (1).

**Statistical analysis**

Data was analyzed using the statistical program SPSS. Descriptive statistics with p-value was compiled using chi-square tests. A summary of the descriptive statistics can be found in Table 1.

Crude odds ratio with 95% confidence interval was calculated using bivariate logistic regression. Logistic regression was used since it is suitable when studying the occurrence or absence of an exposure and when the outcome is odds ratio (Bonita et al., 2010). Odds ratio was calculated by comparing the odds of exposure in the case group with the odds of exposure in the control group (Andersson, 2006).

Control of confounding factors was done in the analysis stage rather than in the design stage, by using multivariate logistic regression. Several independent
variables were added to the analysis at the same time to investigate how they were related to the dependent variable (Ejlertsson, 2012). In this study the variables that were found to be significant in the bivariate logistic regression were adjusted for age and income in the multivariate logistic regression. The correlation between age and income was calculated to $r = -0.237$.

**Ethical considerations**

During the process of formulating the letter of information and consent and planning the data collection, the four obligations formulated at the Declaration of Helsinki in 1964, were taken into account (Andersson, 2006). See Appendix 2. These obligations are furthermore similar to the obligations in the Thai guidelines for research on human subjects (Sueblinvong, Mahaisavariya & Panichkul, 2007). To make sure to follow the Thai guidelines was important since the study was performed in Thailand.

The obligation of information was complied by making sure that each participant got detailed information about the study and that they knew it was voluntary to participate (Ejlertsson, 2012). The information was given both in text and orally. The participants’ autonomy was further protected by making it clear that there would be no negative consequences if they decided not to participate (Andersson, 2006). The letter also explained that it was possible to withdraw at any time, even after finishing the survey. This is in line with the new policies concerning the General Data Protection Regulation (Datainspektionen, 2018). Since the survey was completely anonymous, the staff had to register the exact time each participant filled in the questionnaire, so that it would be possible to withdraw posteriorly. The participants got information about their exact time before leaving.

The obligation of consent was followed by adding one very important sentence to the letter of information and consent: “By completing the survey you accept that your responses will be used in the current and in a future study”. This was important since the data might also be used in a future study. Only people over the age of 18 could participate and this is a necessity for giving one’s consent, without the permission of a parent (Datainspektionen, 2018).
The obligation of confidentiality was complied by making the survey completely anonymous. No written consent was collected and all data was securely stored for a possible future study. In this way no one was able to identify the individuals in the study (Ejlertsson, 2012).

Moreover the data was only used for the purpose of this study, which is in line with the obligation of usage (Andersson, 2006).

No application to a Swedish ethics committee was submitted for this study, since the data was collected in Thailand and since this research was done as part of a university program (SFS 2003:460). Furthermore, as a foreigner you cannot apply to a Thai ethics committee. However, thorough work was done to make sure the study followed ethical procedures for research on human subjects, both in Sweden and Thailand, according to The Declaration of Helsinki (Andersson, 2006) and the Thai guidelines (Sueblinvong, Mahaisavariya & Panichkul, 2007).
Results

Characteristics of the sample
Out of 68 participants, 17.6% (N=12) had HIV. The mean and median ages were 27.8 years and 27.5 years, respectively. Compared with the control group, the HIV-infected participants were more educated, used a condom with paying customers more seldom, were more often homosexuals/bisexuals and had more often experienced physical violence. See Table 1.

Risk factors for HIV
Among the nine studied risk factors, four remained significant after the multivariate logistic regression, namely education level, frequency of condom use with paying customers, sexual identity and experience of physical violence in the last six months. The variables were adjusted for age and income. See Table 2.

Socio-economic factors
The risk for HIV decreased with decreased educational level. The risk was 93.3% lower in the lower education group (“Completed elementary school or lower education”) compared with the higher group (“Completed middle school or higher education”).

Socio-demographic factors
No significant risk factors were found among the socio-demographic variables.

HIV-related risk behaviors
The risk for HIV was 7.9 times higher among the participants who rarely or often used a condom with paying customers, compared with those who always used a condom. Homosexuals, bisexuals and participants who were unsure of their sexual identity had a 10.88 times higher risk for HIV compared with heterosexuals. To have been exposed to physical violence in the last six months was related to an increased risk for HIV with 559% compared with those who had not experienced violence.
Table 1: Characteristics of the study participants. P-values from chi-square tests.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>HIV-positive No. (%) of Total N=12</th>
<th>Controls No. (%) of Total N=56</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Socio-economic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completed middle school or higher education</td>
<td>11 (92)</td>
<td>23 (41)</td>
<td>0.001</td>
</tr>
<tr>
<td>Completed elementary school or lower education</td>
<td>1 (8)</td>
<td>33 (59)</td>
<td></td>
</tr>
<tr>
<td>Income per month</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More than 10,000 baht</td>
<td>7 (58)</td>
<td>23 (41)</td>
<td>0.274</td>
</tr>
<tr>
<td>Less than 10,000 baht</td>
<td>5 (42)</td>
<td>33 (59)</td>
<td></td>
</tr>
<tr>
<td><strong>Socio-demographic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partner</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have a partner</td>
<td>5 (42)</td>
<td>20 (36)</td>
<td>0.698</td>
</tr>
<tr>
<td>Have no partner</td>
<td>7 (58)</td>
<td>36 (64)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-27 years</td>
<td>3 (25)</td>
<td>31 (55)</td>
<td>0.056</td>
</tr>
<tr>
<td>28-42 years</td>
<td>9 (75)</td>
<td>25 (45)</td>
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</tr>
<tr>
<td><strong>Risk behaviors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condom use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Always</td>
<td>2 (17)</td>
<td>36 (64)</td>
<td>0.003</td>
</tr>
<tr>
<td>Rarely/Often</td>
<td>10 (83)</td>
<td>20 (36)</td>
<td></td>
</tr>
<tr>
<td>Sexual orientation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterosexual</td>
<td>1 (8)</td>
<td>31 (55)</td>
<td>0.003</td>
</tr>
<tr>
<td>Homosexual/Bisexual/Unsure</td>
<td>11 (92)</td>
<td>25 (45)</td>
<td></td>
</tr>
<tr>
<td>Drug use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>6 (50)</td>
<td>39 (70)</td>
<td>0.192</td>
</tr>
<tr>
<td>Yes</td>
<td>6 (50)</td>
<td>17 (30)</td>
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</tr>
<tr>
<td>Alcohol use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never/Sometimes</td>
<td>11 (92)</td>
<td>41 (73)</td>
<td>0.171</td>
</tr>
<tr>
<td>Often/Daily</td>
<td>1 (8)</td>
<td>15 (27)</td>
<td></td>
</tr>
<tr>
<td>Physical violence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>5 (42)</td>
<td>45 (80)</td>
<td>0.006</td>
</tr>
<tr>
<td>Yes</td>
<td>7 (58)</td>
<td>11 (20)</td>
<td></td>
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</tbody>
</table>
Table 2: Bivariate and multivariate logistic regression analysis for correlates of HIV. Variables adjusted for age and income.

<table>
<thead>
<tr>
<th>Potential risk factors</th>
<th>Crude odds ratio</th>
<th>CI 95%</th>
<th>Adjusted odds ratio</th>
<th>CI 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Socio-economic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completed middle school or higher education</td>
<td>Ref.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completed elementary school or lower education</td>
<td>0.063</td>
<td>0.008-</td>
<td>0.067</td>
<td>0.007-</td>
</tr>
<tr>
<td>Income per month</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More than 10,000 baht</td>
<td>Ref.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 10,000 baht</td>
<td>0.498</td>
<td>0.140-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Socio-demographic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partner</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have a partner</td>
<td>Ref.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have no partner</td>
<td>0.778</td>
<td>0.218-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-27 years</td>
<td>Ref.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28-42 years</td>
<td>3.720</td>
<td>0.909-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Risk behaviors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condom use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Always</td>
<td>Ref.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rarely/Often</td>
<td>9.000</td>
<td>1.793-</td>
<td>7.897</td>
<td>1.535-</td>
</tr>
<tr>
<td>Sexual orientation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterosexual</td>
<td>Ref.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homosexual/Bisexual/Unsure</td>
<td>13.640</td>
<td>1.647-</td>
<td>10.875</td>
<td>1.255-</td>
</tr>
<tr>
<td>Drug use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Ref.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2.294</td>
<td>0.646-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Alcohol use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never/Sometimes</td>
<td>Ref.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Often/Daily</td>
<td>0.248</td>
<td>0.030-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Physical violence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Ref.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>5.727</td>
<td>1.525-</td>
<td>6.590</td>
<td>1.605-</td>
</tr>
<tr>
<td></td>
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</tbody>
</table>
Discussion

This study showed that, after adjustments for age and income, four variables were associated with an increased risk for HIV; namely high education, lack of condom use, homosexuality/bisexuality and experience of physical violence.

Results discussion

Socio-economic factors

Income was not found to have any significant association with HIV infection.

The most surprising finding in this study was that education level was positively associated with HIV, meaning higher education increased the risk for HIV. This was unexpected since most research on prostituted people shows a negative association between education and HIV (Vandepitte et al., 2011; Coetzee et al., 2017; Scheibe et al., 2014). This is also the case for research on HIV in the population in general (World Food Programme, 2006). Low education level is connected to low social status and impaired health (Marmot, 2006). Education empowers people to make good decisions (Vandemoortele & Delamonica, 2002).

The strong association between high education and HIV could have many possible explanations. A study of students in Nigeria found that people with higher education have more risky sexual behaviors and higher prevalence of HIV, compared with people with lower education (Emeka-Nwabunni, Ibeh & Ogbulie, 2014). Many studies in Africa have shown that there is an association between wealth and HIV (Shelton, Cassell & Adetunji, 2005; Mishra et al., 2007). The reason for this correlation could be the conclusion stated by Parkhurst (2010), that both poverty and wealth have associated risk behaviors that increase the risk for HIV. He found that poverty is for example related to early sex debut and transactional sex while wealth is connected to higher numbers of sex partners and broader sexual networks. As mentioned before, high income and high education are often related (Marmot, 2006). Even if it was not a significant result in this study, the cases had higher income than the controls. The results from the studies above by Shelton et al. (2005), Mishra et al. (2007) and Parkhurst (2010) could give us an indication why the present study found a correlation between high education and HIV. Another explanation could be that sex without the
use of a condom is often more expensive within the prostitution field (Biello et al., 2017) and probably requires more wealthy customers. This study found that those who were infected with HIV used a condom to a lesser extent than the control group. It could be possible that their customers had more money and more often asked for a condomless intercourse. This was however difficult to prove in the present study.

**Socio-demographic factors**

Neither marital status nor age was correlated with HIV. For marital status this was not an expected result, since many studies have found that a partner, who gives social support, can prevent HIV-related risk behaviors (Qiao et al., 2014).

For age this was not as surprising. Even if studies of prostituted women often show a positive association between age and HIV (Iakunchykova & Burlaka, 2017; Nguyen et al., 2009), studies of prostituted men are not as clear (Luo et al., 2015). The study by Fournet et al. (2016) even found a negative association between age and HIV.

**HIV-related risk behaviors**

Among the behavioral risk factors, three of five variables were found to be associated with HIV. No significant correlation was found for drugs and alcohol.

Lack of condom use, homosexuality, bisexuality and violence have been shown in earlier research to increase the risk for HIV among prostituted men (Baral et al., 2015; Boles & Elifson, 1994).

Experience of physical violence, homosexuality and bisexuality are all related to risky sexual behaviors, such as condomless intercourse (World Health Organization, 2005; AVERT, 2019a). This has been found, not only for prostituted people, but also for other groups, such as in the study by Khamisa & Mokgobi (2018), who studied health care workers.

Condom use has been shown to be highly protective against HIV (World Health Organization, 2009), which was also the finding in this study. For a condom to be effective it must be used correctly (Pinkerton & Abramson, 1997) and this could perhaps be the reason why some earlier studies of prostituted people have not found any significant relationship between lack of condom use and HIV infection (Niama et al., 2017; Wang et al., 2009; Vandepitte et al., 2011).
Methodological discussion

The method used in this study, the case-control study, was considered relevant for answering the objective of the study, which was to investigate risk factors for HIV among prostituted men in Chiang Mai, Thailand. However, this study was not suitable for measuring causal relationships, but rather associations (Rothman, 2002) The reason is that the sequence in time between the cause and the effect could not be ensured, since the cause and effect were measured at the same time (Bonita et al., 2010).

Furthermore, one of the advantages of the case-control study is that it can be used to study rare diseases (Andersson, 2006) but this was not the case in the present study. As mentioned before, the HIV prevalence among prostituted men in Thailand is as high as 12 % (UNAIDS, 2015). In this study it was even higher; 17.6 %. Despite this, the case-control method was considered the best alternative for this master’s thesis, since it is relatively simple, cost effective and not as time consuming as the prospective cohort study (Rothman, 2002).

When studying the wide confidence intervals in the results, it is evident that the study had a small sample size (du Prel, Hommel, Röhrig, & Blettner, 2009). The staff at Urban Light and Caremat however searched for participants very meticulously, but since prostitution among men is so stigmatized it was a challenge to find men who matched the inclusion criterions. Even if only 12 cases were found and the total number of participants was not high, the hope is that this study can contribute with some important knowledge to the limited research about prostituted men (Baral et al., 2015). It is unfortunately harder to do generalizations because of the small sample size (Faber & Fonseca, 2014) but the study investigated nonetheless some important and especial research questions.

It was not possible to use only incidence data in the study, which is the best way to calculate risks (Bonita et al., 2010), because it would have made it even harder to find cases.

There are a number of possible biases that are worth mentioning. Sampling bias is one such example. The staff at Urban Light and Caremat looked for participants in the districts where they normally work. They did not reach out to all prostituted men in Chiang Mai. Moreover the sample size was very small. This must be kept in mind.
when generalizing, since the sample might not be completely representative for the population (Andersson, 2006). It could also be the case that the people who participated in the study differed from those that did not participated, in other words selection bias (Bonita et al., 2010). There was no drop-out but it is possible that the people that the staff never got to meet, because of the sensitivity surrounding this group, differed from the ones who were more easily approachable. Observer bias and information bias were not considered a relevant problem in this study. The measurements were not believed to be influenced by the observers and the measurements were not done differently for the cases and the controls (Andersson, 2006). When it comes to measurement bias, in other words that the measurements did not measure what they were supposed to measure (Bonita et al., 2010), there was an impending worry concerning self-reported HIV-status. This is because self-reported health status has been shown to sometimes differ from the reality (Short et al., 2009). In this study the risk was that, due to the strong stigmatization, some of the participants might have lied about their HIV-status. If that was the case it is possible that the differences between the case and the control group might have been underestimated. The risk was perhaps limited through the staff at Urban Light and Caremat who are well known in the areas where prostitution takes place. The trust between the staff and the participants was believed to have prevented false answers. With the use of a questionnaire there is always a risk of recall bias. The case and control group might have remembered different things about what happened in the past (Bonita et al., 2010). This could have influenced the results in the study, even if the risk was not considered impending.

The reliability was considered relatively high in the present study. It would therefore be possible to get the same results after repeated measurements using the questionnaire and with different examiners (Andersson, 2006).

The cases and controls were not matched, which otherwise is a good way to decrease the influence of confounders (Andersson, 2006). In the multivariate logistic regression analysis, the variables were controlled for age and income only. This was a necessity because when the sample size is small, a regression model cannot include several confounding factors (Braga, Farrokhyar & Bhandari, 2012).
When it comes to the ethical issues throughout the study, no relevant problems were detected. One critical point was when the staff approached the men and asked them to participate in the study. The risk was that the participants could have been exposed when they filled out the questionnaire on the tablet. This was however not considered a problem. The staff is well known among the prostituted men and they often have conversations with them. Therefore, there was no commotion surrounding the data collection.

**Conclusions and implications**

This study found four variables that were associated with an increased risk for HIV, namely high education, lack of condom use, homosexuality/bisexuality and experience of physical violence.

The present study raises some new questions for further research. One of them concerns the positive association between education and HIV. This study found that high education increased the risk for HIV infection, but most research shows an opposite association. Further research could for example investigate if prostituted men in Thailand differ from prostituted men in other parts of the world. Another question concerns the five variables that were not found to have a significant correlation with HIV. The results would probably look slightly different in a study with a bigger sample size and more cases. An interesting future research question would also be to study what kind of physical violence that increases the risk for HIV among prostituted men, for example if the risk looks different for knife fights, punches, kicks and pushes etc.?

This study found that lack of condom use increased the risk for HIV. This is important knowledge when creating intervention programs in the future. In all HIV prevention among prostituted men, condom use should always be emphasized.

The current study could also have implications for which groups within the group of prostituted men that should be prioritized. The risk for HIV among homosexuals and bisexuals were much higher than among heterosexuals. Interventions should perhaps therefore be more targeted towards the first two groups.
Hopefully, this study can contribute with some important knowledge to the public health field when it comes to HIV among prostituted men. The hope is also that the results from this study will raise an interest to investigate this subject further, especially as the research about HIV among prostituted men today is limited.

**Acknowledgements**

This study would not have been possible without the help from Urban Light and Caremat. Their insistent work to find participants and carry out the data collection was invaluable.
References


Appendix

Appendix 1, Questionnaire

Questionnaire about HIV and risk factors

Introduction: We invite you to participate in a study about risk factors for HIV among prostituted men in Chiang Mai. Men who are working in the sex industry and are between 18 and 45 years old are invited to participate in this survey, that takes about 3-5 minutes to complete. Thank you for your participation.

1. Have you sold sex in exchange for money or goods at least one time in the last 6 months?
   Yes
   No

2. Age.
   ______________

3. Are you HIV positive?
   Yes
   No

4. Education level or equivalent. Choose one alternative.
   No formal schooling
   Not completed elementary school
   Completed elementary school
   Completed middle school
   Completed high school
   University
5. Marital status. Choose one alternative.
Single
Currently having a steady partner
Married
Divorced/separated
Widower

6. Frequency of condom use with paying customers.
Never
Rarely
Half of the time
Most of the time, but not always
Always

7. Number of years working in the sex industry (selling sex in exchange for money or goods)
Less than 1 year
1-2 years
2-3 years
3-4 years
More than 4 years

8. Self-defined sexual orientation (sexual attraction)
Homosexual
Heterosexual
Bisexual
Unsure
9. Have you used drugs in the last 6 months (smoking, snorting, injecting)?
   Yes
   No

10. Income per month (make an estimation. Ask for help if needed)
    Less than 5,000 Baht
    5,000-10,000 Baht
    10,000-15,000 Baht
    More than 15,000 Baht

11. Frequency of alcohol use.
    Never
    Sometimes
    Often
    Daily

12. Have you been exposed to physical violence in the last 6 months (e.g. punches, kicks, pushes)
    Yes
    No

13. Place of birth.
    Chiang Mai
    Another city or province in Thailand
    Born outside of Thailand
Letter of information and consent

Title of the study: Risk factors for HIV among prostituted men in Chiang Mai, Thailand

We invite you to participate in this study about risk factors for HIV among prostituted men in Chiang Mai. Your participation will help to determine which factors contribute to the high prevalence of HIV among prostituted men. We hope that the results from this study will help in developing effective interventions that can prevent people from getting infected with HIV in the future.

Men who are working in the sex industry and are between 18 and 45 years old will be invited to participate in a survey, that takes about 3-5 minutes to complete. The questions are about different risk factors for HIV; for example education level, frequency of condom use, drug use, violence and sexual orientation. Around 75 people will be asked to participate.

Your responses will be anonymous and you will not be asked to give any information that can expose who you are. The results of this study may be used in a future research study and therefore the data will be saved in a database. All data will be securely stored. The results of the study will be presented as a thesis and you are welcome to contact us if you are interested in reading the final version. After completing the questionnaire you will be offered a gift voucher of 200 Baht as a compensation.

Your participation is voluntary. If you choose to participate, you can withdraw at any time. If you decide not to participate or if you preterm, there will be no negative consequences for you. If you, after finishing the survey, want to withdraw
from the study you are able to do so by contacting Paan Jongpajitsakul (094 3296942).

By completing the survey you accept that your responses will be used in the current and in a future study.

The study is being conducted by Sara Ask as a master’s thesis at Mid Sweden University in Sweden. The study follows ethical procedures for research on human subjects.

Chiang Mai, 2019-02-04.

If you have any questions you are welcome to contact:

Sara Ask (student): 062 0275367, saravictorsson@me.com
Katja Gillander Gådin (tutor): katja.gillandergadin@miun.se
Paan Jongpajitsakul (Urban Light), 094 3296942, paan@urbanlight.com
Appendix 3, Letter of information and consent, Thai

เอกสารแนะนำย้อมยุติและขอความอิ่มข้อม

เรื่อง ปัจจัยเสี่ยงต่อการติดเชื้อเอชไอวีในกลุ่มชายชาวบวารในจังหวัดเชียงใหม่

เราขอเชิญท่านเข้าร่วมในการศึกษาเกี่ยวกับปัจจัยเสี่ยงต่อการติดเชื้อเอชไอวีในกลุ่มชายชาวบวารในจังหวัดเชียงใหม่ การเข้าร่วมของการจะช่วยให้ทราบถึงปัจจัยที่ส่งผลให้เกิดความสุขของเอชไอวีที่สูงในกลุ่มชายชาวบวาร เราหวังว่าผลจากการศึกษารับนี้จะช่วยในการเพิ่มการทราบถึงความรู้ทางการทัศนศิลปะที่สามารถป้องกันไม่ให้คนติดเชื้อเอชไอวีในอนาคต

ผู้เข้าใจที่มีประสบการณ์เกี่ยวกับการรายบวารและเกิดอายุระหว่าง 18 ถึง 45 ปี จะถูกเชิญให้เข้าร่วมในการสัมภาษณ์ซึ่งจะใช้เวลาในการตอบแบบสอบถามประมาณ 3-5 นาที แบบสอบถามจะถามท่านถึงปัจจัยเสี่ยงต่อการติดเชื้อเอชไอวีที่แตกต่างกัน เช่น ระดับการศึกษา ความมั่นใจในการใช้ถุงยางอนามัย การใช้ยา การใช้ความรู้.wrap และเรื่องของการสืบพันธุ์ เป็นต้น โดยจะมีผู้ช่วยให้เข้าร่วมในการศึกษานี้ประมาณ 75 คน

แบบสอบถามของท่านจะไม่ถูกระบุชื่อ และท่านจะไม่ถูกบอกเพื่อให้ชื่อของท่าน ที่สามารถทราบว่าท่านเป็นใคร จากผลของการศึกษาที่อาจได้รับในการศึกษาวิจัยในอนาคต แต่ขอชื่อย่อจะถูกเก็บไว้ในฐานะชื่อย่อที่จะถูกเก็บไว้ในทะเบียน ผลของการศึกษาจะถูกนำเสนอเป็นวิทยานิพนธ์และกรุณาติดต่อผู้ที่จัดเก็บ หากท่านสนใจอยู่ในผลบุญบัณฑิต หลังจากเสร็จสิ้นการตอบแบบสอบถามท่านจะได้รับค่าตอบแทนจำนวน 200 บาท

การเข้าร่วมของท่านเป็นความสมัครใจ หากท่านเลือกที่จะเข้าร่วม ท่านสามารถยุติการเข้าร่วมได้ แต่หากท่านตัดสินใจไม่เข้าร่วม หรือ ท่านไม่สนใจเข้าร่วม จะไม่มีผลกระทบกับท่าน กับท่าน หากท่านต้องการสอบถามข้อมูลเกี่ยวกับกระบวนการ กรุณาติดต่อกับท่านที่ท่านท่านแบบสอบถาม เสร็จแล้ว ท่านสามารถติดต่อกับศูนย์บริการยา ของโรงพยาบาล (บ้าน) ที่เบอร์โทรศัพท์ 0943296942
เมื่อทำแบบสอบถามเสร็จสิ้นแล้ว ท่านจะรับรู้ว่าคำตอบของท่านจะถูกนำไปใช้ในการศึกษาพิจารณาเพื่อเป็นข้อมูลการศึกษาทั้งปวง

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เขียนใหม่, 2019-02-04

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