Revelation and Science
Vol. 06, No. 01 (1437H/2016) 7-16

Transgenders in Kuantan, Pahang: Knowledge and Attitude towards HIV/AIDS

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Abstract

Lack of knowledge and negative attitude towards HIV/AIDS may be the risk factors for HIV infection among transgenders. The researches done on knowledge and attitude towards HIV infection in transgender communities are very limited at both local and international levels. This study aimed to assess the knowledge and attitude on HIV infection among the male-to-female transgender community in Kuantan, Pahang. A cross-sectional study was carried out from July to August in 2014 among 33 male-to-female transgenders in Kuantan, Pahang. Convenience sampling was used. Participants who gave consent answered a self-administered questionnaire. The data obtained was analyzed with descriptive statistics, χ^2-test, and independent sample t test. Majority of the subjects in this study was 29 years and below (48.5%), Muslims (93.9%), and completed up to secondary education (60.6%). A higher percentage of them also sold sex (60.6%), and had relatively low income (from "no income" to RM 3000, mean = RM1528). 87.9% of the subjects demonstrated good knowledge and also positive attitude towards HIV/AIDS. Level of education was significantly associated with scores in knowledge (p=0.01). Despite the positive outcome from this study, misconceptions towards HIV/AIDS still exist among transgenders. Transgenders must not be rejected from receiving education. Their medical and spiritual needs must be addressed. Educations and interventions towards HIV/AIDS are desperately needed to deliver the correct information to this population, so as to emphasize prevention, early detection, and holistic medical care. Transgenders also require attentions from religious bodies and non-governmental organizations to provide help in employment, financial, spiritual, and psycho-social issues.

Keyword: *sex worker, HIV/AIDS, misconceptions, male-to-female, transgender*

Abstrak

Kekurangan pengetahuan dan sikap negatif terhadap HIV / AIDS boleh menjadi faktor risiko untuk jangkitan HIV di kalangan golongan *transgender*. Bilangan kajian yang dilakukan ke atas pengetahuan dan sikap terhadap jangkitan HIV dalam komuniti transgender adalah sangat terhad di peringkat tempatan dan antarabangsa. Kajian ini bertujuan untuk menilai pengetahuan dan sikap mengenai jangkitan HIV di kalangan masyarakat *transgender* lelaki ke perempuan di Kuantan, Pahang. Satu kajian keratan lintang telah dijalankan dari Julai hingga Ogos pada tahun 2014 di kalangan 33 *transgender* lelaki ke perempuan di Kuantan, Pahang. Kemudahan persampelan telah digunakan. Peserta memberikan persetujuan menjawab soal selidik yang ditadbir sendiri. Data yang diperolehi dianalisis dengan statistik deskriptif, ujian-χ2, dan ujian sampel t yang tidak bersandar. Subjek yang majoriti dalam kajian ini adalah 29 tahun dan ke bawah (48.5%), Islam (93.9%), dan sempurna pendidikan menengah (60.6%). Peratusan tinggi daripada mereka adalah menjual seks (60.6%), dan mempunyai pendapatan yang rendah (tiada pendapatan kepada RM 3000, min = RM1528). 87.9% daripada subjek menunjukkan pengetahuan yang baik dan juga sikap yang positif terhadap HIV/AIDS. Tahap pendidikan mempunyai kaitan yang ketara dengan skor dalam pengetahuan (p = 0.01). Walaupun terdapat hasil yang positif daripada kajian ini, salah faham terhadap HIV/AIDS masih wujud di kalangan *transgender*. *Transgender* tidak boleh menolak daripada menerima pendidikan. Keperluan perubatan dan rohani mereka mesti ditangani. Pendidikan dan campur tangan terhadap HIV/AIDS adalah sangat diperlukan untuk menyampaikan maklumat yang betul kepada populasi ini, begitu juga penekanan bagi pencegahan, pengesanan awal dan rawatan perubatan holistik. *Transgender* juga

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memerlukan perhatian daripada badan-badan agama dan pertubuhan bukan kerajaan untuk memberikan bantuan dalam pekerjaan, isu-isu kewangan, rohani, dan psiko-sosial.

Kata kunci: *kelaziman, HIV/AIDS, pengetahuan, sikap, transgender*

Introduction

The first case of HIV in Malaysia was reported in 1986. Within 28 years, the cumulative number of reported HIV infection had reached 101,672. The estimated number of people living with HIV infection by the end of 2013 was 86,324, where, in 2013 alone, the number of reported cases of newly diagnosed HIV infection was 3,393. In this country with a total population of slightly less than 29 million, HIV has become an epidemic. In the early phase, the epidemic was driven by injecting drug users. Since 1994, the trend of HIV transmission began to shift towards sex. The transgenders belonged to one of the most-at-risk populations (Disease Control Division, 2010).

The term transgender refers to individuals who experience persistent and distressing discomfort with their biological sex, and wish to live as the opposite sex from which they have been born with (Clements-Nolle et al., 2001; Teh, 2008; Wei et al., 2012). They are labelled as sexual deviants and are generally discriminated by the society in Malaysia and also other parts of the world (Joint United Nations Programme on HIV/AIDS (UNAIDS), 2014; Teh, 2008; Wei et al., 2012). This stigma leads to several difficulties in employment and access to healthcare (Baral et al., 2013; Clements-Nolle et al, 2001; Disease Control Division, 2010; Joint United Nations Programme on HIV/AIDS (UNAIDS), 2014; Teh, 2008). Studies in Malaysia showed that more than 80% of them ended up in the sex trade (Disease Control Division, 2010; Teh, 2008). In 2012, Malaysian Ministry of Health carried out the nationwide Integrated Bio-Behavioural Surveillance (IBBS) studies. The findings of these studies revealed that many of the transgenders engaged in activities that put them at high risk for HIV infection, and HIV prevalence among the transgenders alone was 5.7% (Disease Control Division, 2010).

Lack of knowledge and negative attitude in HIV/AIDS are the main risk factors for HIV infection among transgenders and other populations (Al-Rabeei et al., 2012; Kenagy, 2002; Thanavanh et al., 2013). However there are very limited research and data on the transgender population when it comes to evaluation of HIV/AIDS education programs (Joint United Nations Programme on HIV/AIDS (UNAIDS), 2014). This study was carried out to describe the socio-demographic profile among male-to-female-transgenders in Kuantan, to identify their main sources of information on HIV/AIDS and to assess their knowledge and attitude towards HIV/AIDS. It was hoped that HIV-related problem in this community could be identified and addressed, so that holistic policy and programs could be developed for this population for better care.

Materials and Methods

A cross-sectional study was carried out at four areas of Kuantan, where the transgenders frequently appear. Thus, these areas were taken to represent the entire town. The study period took seven weeks from July to August, 2014. The research protocol was approved by IIUM Research Ethical Committee.

The target population consists of all male-to-female transgenders in the mentioned four areas in Kuantan, who could understand English or Malay language. Despite convenient sampling method was used, only 33 subjects gave consent for participation.

An anonymous and self-administered questionnaire, known as the Development and Psychometric Evaluation of Brief HIV Knowledge Questionnaire (HIV-KQ-18) (Carey & Schroder, 2002), was used. It was translated into Malay language and obtained a Cronbach's alpha of 0.70, after being validated by a pilot study performed on five transgenders who were not included as the subjects in this study. The questionnaire consists of five parts: 1) socio-demographic information, 2) knowledge on HIV/AIDS, 3) attitude towards HIV/AIDS, 4) source of information on HIV/AIDS, and 5) self-reported information on HIV testing and HIV status. Scorings were used when assessing the knowledge and attitude towards HIV/AIDS.

The level of knowledge and attitude were classified into "good" or "poor" with the cut-off point of 50% obtained from the scoring system. Data analysis was then done with the Statistical Package for Social Sciences Software (SPSS) version 19. Statistical significance was set to be $p < 0.05$. Descriptive statistics, χ^2-test, and independent sample t test were used.

Results

The mean age among the transgenders was 35.15 ± 10.62 years. Most of them (48.5%) were 29 years and below, with 21.2% of them were between 30 to 39 years, and 30.3% of them were 40 years and above. Sixty percent of the subjects were sex workers, the rest of the subjects had some skills (27.3%), were doing labor work (3.0%), or unemployed (9.1%). Majority

(93.9%) were Muslims, while the rest were Christians (3.0%) and Hindus (3.0%). Education levels varied from tertiary (21.2%), secondary (60.6%), primary (12.1%), or none at all (6.1%). Out of the 33 subjects, 3 (9.1%) had no income at all. Their monthly income ranged between RM 200 to RM 3000, with a mean of RM 1528. Together, 15.2% of them earned less than RM 1000 monthly, 24.2% earned between RM 1000 to RM 2000, while 51.5% of them earned more than RM 2000 a month.

Table 1: Sources of information on HIV/AIDS among male-to-female transgenders in Kuantan (n = 33)

Source of information	Frequency (n)	Percentage (%)
Friends	25	75.8
Health officers	25	75.8
Television	24	72.7
Newspapers	21	63.6
Non-Governmental Organisation (NGO)	18	54.5
Internet	17	51.5
Radio	16	48.5
Posters and pamphlets	13	39.4
Teachers	11	33.3
Family members	8	24.2
Others (such as magazines, books)	10	30.3

From table 1, the main sources of information on HIV/AIDS were friends (75.8%), health officers (75.8%), Television (72.7%), followed by newspapers (63.6%), non-government organization (54.5%), and internet (51.5%). Others were radio (48.5%), posters and pamphlets (39.4%), teachers (33.3%), family members (24.2%), and others such as magazines and books (30.3%).

Among the 33 subjects, 29 (87.9%) of them have had HIV status tested within the last 5 years, out of which only one of them was tested for HIV within the past one year. Among these 29 subjects, two of them were HIV positive, one of which reported to have been on anti-retroviral therapy; four of them claimed to be HIV negative, while 81.8% of them were unsure. Places where HIV infection was tested were private clinics (34.4%), government health clinics (24.1%), hospitals (17.2%), pharmacy (3.4%), and drug intervention centers (20.7%).

Only four subjects answered all questions correctly. As shown in Table 2, questions on knowledge about mode of transmission through sexual means (questions 4, 11, 14, 17) were answered correctly by 67.7% to 84.8% of the subjects. About 63.7% of the subjects did not know that withdrawal of penis before climax cannot prevent HIV infection, and only 30.3% knew that natural skin condoms do not work better than latex condoms do against HIV. From Table 3, 97% of the subjects were willing to use condoms, with 90.9% of them were willing to accept free condoms. Majority (81.8%) of them were willing to volunteer for HIV screening test.

Among the subjects, 87.9% demonstrated good level of knowledge and attitude towards HIV/AIDS. Age, occupation, income, religion and education level were analyzed against level of knowledge and attitude towards HIV/AIDS (Table 4). Only level of education was significantly associated with level of knowledge on HIV/AIDS ($p = 0.01$).

Discussion

Age distribution in this study was similar to a study in Thailand, where majority of the subjects were below 29 years of age (Guadamuz et al., 2011). In another study in Malaysia, the subjects were all 30 years and above (Wei et al., 2012). These findings were consistent with the result in this study, where the subjects came from the younger age group as well. These transgenders engaging in sex trade at the prime of their life strongly suggested this was a result of social discrimination, financial vulnerability, and difficulties in finding employment (Van Devanter et al., 2011).

Education levels were found to be similar to previous studies, where majority of them had completed secondary education (Guadamuz et al., 2011; Wei et al., 2012). Hence, the positive impact could be maximized by enforcing educations on HIV/AIDS in secondary schools. Besides, it is also thought that transgenders with higher education levels were more capable to educate themselves by proactively seeking information on HIV/AIDS from multiple sources, and were also more capable of understanding the information they obtained.

Table 2: Level of knowledge on HIV/AIDS among the male-to-female transgenders in Kuantan (n=33)

Item No.	Questions on Knowledge	Answered correctly N (%)	Answered "true" N (%)	Answered "false" N (%)	Answered "I don't know" N (%)
1.	Coughing and sneezing DO NOT spread HIV.	21 (63.6)	21 (63.6)	5 (15.2)	7 (21.2)
2.	A person can get HIV by sharing a glass of water with someone who has HIV.	24 (72.7)	2 (6.1)	24 (72.7)	7 (21.2)
3.	Pulling out of the penis before a man climaxes/cums prevents a woman from getting HIV during sex.	12 (36.4)	12 (36.4)	12 (36.4)	9 (27.3)
4.	A woman can get HIV if she has anal sex with man.	26 (78.8)	26 (78.8)	2 (6.1)	5 (15.2)
5.	Showering, or washing one's genital/private parts, after sex keeps a person from getting HIV.	19 (57.6)	9 (27.3)	19 (57.6)	5 (15.2)
6.	All pregnant woman infected with HIV will have babies born with AIDS.	17 (51.5)	14 (42.4)	17 (51.5)	2 (6.1)
7.	People who have been infected with HIV quickly show serious signs of being infected.	17 (51.5)	13 (39.4)	17 (51.5)	3 (9.1)
8.	There is a vaccine that can stop humans from getting HIV.	15 (45.5)	8 (24.2)	15 (45.5)	10 (30.3)
9.	People are likely to get HIV by deep kissing, putting their tongue in their partner's mouth, if who has HIV.	17 (51.5)	11 (33.3)	17 (51.5)	5 (15.2)
10.	A woman cannot get HIV if she has sex during her period.	20 (60.6)	4 (12.1)	20 (60.6)	9 (27.3)
11.	There is female condom that can help decrease a woman's chances of getting HIV.	23 (69.7)	23 (69.7)	5 (15.2)	5 (15.2)
12.	A natural skin condom works better against HIV than does a latex condom.	10 (30.3)	8 (24.2)	10 (30.3)	15 (45.5)
13.	A person will NOT get HIV if she or he is taking antibiotics.	20 (60.6)	8 (24.2)	20 (60.6)	5 (15.2)
14.	Having sex with more than one partner can increase a person's chance of being infected with HIV.	28 (84.8)	28 (84.8)	3 (9.1)	2 (6.1)
15.	Taking a test for HIV one week after having sex will tell a person if she or he has HIV.	19 (57.6)	7 (21.2)	19 (57.6)	7 (21.2)
16.	A person can get HIV by sitting in a bath tub or a swimming pool with a person who has HIV.	28 (84.8)	2 (6.1)	28 (84.8)	3 (9.1)
17.	A person can get HIV from oral sex.	23 (67.7)	23 (67.7)	7 (21.2)	3 (9.1)
18.	Using Vaseline or baby oil with condoms lowers the chance of getting HIV.	19 (57.6)	5 (15.2)	19 (57.6)	9 (27.3)

Table 3: Attitude towards HIV/AIDS from the male-to-female transgenders in Kuantan (n = 33)

Item No.	Questions on attitude	Answered correctly N (%)	Answered "agree" N (%)	Answered "disagree" N (%)	Answered "not sure" N (%)
1.	I am willing to intermingle with HIV/AIDS patients	28 (84.8)	28 (84.8)	0 (0)	5 (15.2)
2.	I am willing to eat food prepared by HIV patients	22 (66.7)	22 (66.7)	6 (18.2)	5 (15.2)
3.	I am willing to share toilet with HIV patients	26 (78.8)	26 (78.8)	3 (9.1)	4 (12.1)
4.	I am willing to support family members with HIV/AIDS	28 (84.8)	28 (84.8)	4 (12.1)	1 (3.0)
5.	I am willing to volunteer for HIV screening test	27 (81.8)	27 (81.8)	5 (15.2)	1 (3.0)
6.	I am loyal to my spouse who was infected by HIV/AIDS through blood transfusion	3 (9.1)	3 (9.1)	18 (54.5)	12 (36.4)
7.	I am loyal to my spouse who was infected by HIV through needle sharing	1 (3.0)	1 (3.0)	25 (75.8)	7 (21.2)
8.	As a preventive measure, if infected with HIV, I am willing if to use condoms	32 (97.0)	32 (97.0)	0 (0)	1 (3.0)
9.	If infected with HIV, I am willing accept needle exchange programs	17 (51.5)	17 (51.5)	11 (33.3)	5 (15.2)
10.	As a preventive measure, if infected with HIV, I am willing accept free condom	30 (90.9)	30 (90.9)	2 (6.1)	1 (3.0)

Table 4: Bivariate statistical analysis on association between socio-demographic variables of the male-to-female transgenders with knowledge and attitude towards HIV/AIDS (n = 33)

Socio-demographic characteristics	**Good knowledge** N = 29 (87.9%)	**Poor knowledge** N= 4 (12.1%)	**P value**	**Good attitude** N = 29 (87.9%)	**Poor attitude** N= 4 (12.1%)	**P value**
	Mean (±SD)	Mean (±SD)		Mean (±SD)	Mean (±SD)	
Age*	36.10(± 10.73)	28.25 (± 7.59)	0.128	35.10 (± 9.76)	35.50(± 17.71)	0.968
≤29	13 (44.8%)	3 (75.0%)	0.400	14 (48.3%)	2 (50.0%)	1.000
30-39	6 (20.7%)	1 (25.0%)		6 (20.7%)	1 (25.0%)	
≥40	10 (34.5%)	0 (0%)		9 (31.0%)	1 (25.0%)	
Income*	1734.62(± 680.00)	1500.00(± 1227.46)	0.569	1711.54 (± 769.07)	1650.00 (± 700.00)	0.879
< 1000	3 (11.5%)	2 (50.0%)	0.167	4 (15.4%)	1 (25.0%)	0.455
1000 – 2000	8 (30.8%)	0 (0%)		8 (30.8%)	0 (0%)	
> 2000	15 (57.7%)	2 (50.0%)		14 (53.8%)	3 (75.0%)	
Occupation						
Skilled	8 (30.7%)	1 (14.2%)	0.723	9 (31.0%)	0 (0%)	0.998
Labourer	1 (3.8%)	0 (0%)		1 (3.4%)	0 (0%)	
Sex worker	17 (65.4%)	3 (42.90%)		16 (55.2%)	4 (100%)	
Unemployed	0 (0%)	3 (42.9%)		3 (10.3 %)	0 (0%)	
Religion						
Islam	27 (93.1%)	4 (100%)	1.000	27 (93.1%)	4 (100%)	1.000
Christian	1 (3.4%)	0 (0%)		1 (3.4%)	0 (0%)	
Hindu	1 (3.4%)	0 (0%)		1 (3.4%)	0 (0%)	
Education level						
None	1 (3.4%)	1 (25.0%)	**0.010****	2 (6.9%)	0 (0%)	0.441
Primary	2 (6.9%)	2 (50.0%)		4 (13.8%)	0 (0%)	
Secondary	20 (69.0%)	0 (0%)		18 (62.1%)	2 (50%)	
Tertiary	6 (20.7%)	1 (25.0%)		5 (17.2%)	2 (50%)	

Muslims formed the majority of the transgender community in the areas studied, which is similar to previous studies in Malaysia as well (Teh, 2008; Wei et al., 2012). Most of the subjects in this study were sex workers. In comparison to another study in Kuala Lumpur, only 25% of the subjects in Kuala Lumpur sold sex, while the rest of the subjects in Kuala Lumpur were unemployed or had some part time jobs. However, it is suspected that the prevalence of sex workers was under-reported in the Kuala Lumpur study.

Contrary to the similar study in Kuala Lumpur in 2012, where more than half of the subjects earned less than RM 1000 per month, half of the subjects in this study had a monthly income of RM 2000 to RM 3000. However, some subjects in this study were still rendered below the poverty line income of RM 800 (The Economic Planning Unit, 2010). Compared to 2014 mean monthly gross household income of RM4343 in Pahang, the subjects in this study had far lower income, with a mean of RM 1528, even lower than the bottom 40% of the population (The Economic Planning Unit, 2015a,b).

Many of the subjects in this present study relied on a variety of sources to obtain information on HIV/AIDS. This suggests that government agencies, non-government organizations, and other related groups and agencies would have to go extra miles to combat HIV/AIDS by educating this community, for example, by organizing more health programs and workshops. A high percentage (75.8%) of these transgenders getting information on HIV/AIDS from health officers could indicate a good rapport between this community and the local health officers, contrary to the report in a study from San Francisco (Sevelius et al., 2014). Also, friends were an important source of information as well (75.8%). Similar to other studies in Malaysia as well as in Korea, Italy, Iran, and Israel, mass media (e.g. newspapers, internet, radio, television) were sources of information on HIV/AIDS, especially television (72.7%) (Brook, 1999; Mehra et al., 2014; Signorelli et al., 2006; Thanavanh et al., 2013; Wong et al., 2008; Yoo et al., 2005). These indicators were positive and encouraging, and should be stressed on, so that health education on HIV/AIDS could be promoted further from these perspectives. Besides, efforts should be made to ensure reliable information to be provided to this community, and cultural values and prejudice about HIV/AIDS and sexuality must be corrected (Wolffers, 1997).

In comparison to all adults of reproductive age, transgenders were 49 times more likely to acquire HIV infection (Baral et al., 2013). Majority of the subjects in this study had their HIV status tested, only two were known to be HIV positive. This prevalence reported in this study was similar to that obtained from the 2012 national studies (Disease Control Division, 2010), however, it has been highly suspected that a large number of the HIV infection cases were under-reported, and the actual prevalence could be much higher, as shown in studies from other countries, where the prevalence could be as high as 19% to 31.9%, and even 68% (Elifson et al., 1993; Joint United Nations Programme on HIV/AIDS (UNAIDS), 2014). Besides, in this study, majority of them did not test for HIV status in the most recent period (for the past one month), and 80% of them were unsure of their HIV status. It was not known whether they had already been infected; and if they had already been infected, the number of sex partners they have had. HIV infections in transgenders must not be missed or underdiagnosed.

Transgenders are in urgent need for HIV prevention, treatment, and medical care (Baral et al., 2013). National data showed that only less than half of people living with HIV by 2013 were receiving anti-retroviral therapy (ART) (Disease Control Division, 2010). Thus, the effort for enforcing ART was still far from optimal in this country and, needless to say, the transgender community. Furthermore, it was reported that transgenders had lower rates of treatment adherence in comparison to other communities (Sevelius et al., 2014). Barrier still exists, hindering the transgenders from accessing HIV prevention and health care services (Open Society Foundations, 2013). This would be a big loophole that still needed to be filled with dedications.

The reason transgenders in this study preferred drug intervention centers, private and government health clinics for HIV tests could be because the healthcare personnel in these places showed less degree of discriminations, were more friendly and sensitive in approach, and offered holistic treatment in comparison to other places (Disease Control Division, 2010; Grossman & D'augelli, 2006; Kenagy, 2002; Melendez & Pinto, 2009) .

Despite the good results coming from majority of the subjects, many of the subjects were still lacking in knowledge in HIV/AIDS. Some of the subjects were still unaware that having sex with more than one partner can increase a person's chance of being infected with HIV, some believed that there is a vaccine that could prevent HIV/AIDS, and some even believed that washing after sex can prevent HIV infection. Subjects who were unaware that an asymptomatic, HIV-positive sex partner could place themselves more at risk, because they could be infected by an apparently healthy-looking partner (Sarker et al., 2005). Misconceptions on HIV transmission and other aspects of infection indicate that the subjects were not getting access to the correct information on HIV

infection (Al-Rabeei et al., 2012). A big number (69.7%) of the subjects did not know about natural skin condom, but this could be because they were more familiar with latex condoms, and natural skin condom was not popular in Malaysia. Despite this, this study showed that level of education had significant associations with the level of knowledge on HIV/AIDS, as supported by studies in several parts of the world as well (Haile et al., 2007; Lui et al., 2014). This result suggests successful education on HIV/AIDS to students in secondary and tertiary education levels is beneficial, and also emphasizing that transgenders must not be discriminated from formal education.

The overall positive attitude towards HIV infection could be that because the subjects in this study were generally knowledgeable about HIV/AIDS (Paul, 2011), and they were living among HIV positive peers; thus, they were more accepting towards people with HIV infection, in contrast to many other studies where their subjects were normal, healthy people (Thanavanh et al., 2013). In this study, the subjects' negative attitude, or apathy, towards spouses with HIV infection (questions 6 and 7) could be that because they were sex workers, and did not have a stable marital relationship or a fixed sexual partner. The high percentage of willingness of condom use, especially among sex workers in this study, suggested that this community were highly aware of prevention on HIV infection through condom use, and thus desperately need prevention programs. The higher the level of awareness of HIV/AIDS and condom use, the more they could practice safe sex (Teh, 2008). The majority of the subjects in this study were unsure of their HIV status, however, an extremely large number of them were keen to have their HIV status tested. This suggests that the transgenders were still apprehensive towards discriminations in HIV-related medical services, and were hesitant or in denial to know their test results (Teh, 2008).

Limitations

The transgenders belonged to a marginalized population, and choose to be secluded from the society. Immense difficulties were encountered when recruitment of subjects was carried out in this population. They also showed excessive concerns in privacy against the study because of fear from social stigma, and many of them eventually refused to give consent to participate. This rendered the sample size to only 33 subjects, and a drastic drop in the precision rate of this study.

Recommendation

Since not many studies have been done on transgender populations, more studies in the future are highly encouraged. To obtain a more accurate result, larger scales of a similar study can be carried out. Suggestions derived from the methodology of the present study include extending the period of study, improving the strategies in communication with the transgenders so as to urge them to take part in the study, screening for HIV infection among the subjects instead of relying on self-reported HIV status, by using the HIV KQ-45 questionnaire which can assess the subjects more accurately.

Prevalence of unprotected sexual behaviors, the number of lifetime sex partners, and other high risk behaviors related to HIV-infections such as injecting drug use could also be studied, as these could provide more detailed descriptions on the high risk behaviors in this population.

Besides HIV/AIDS, other sexually transmitted diseases can also be studied in this population, so that awareness of sexually transmitted diseases can be raised as a whole with HIV/AIDS within this population, and harm-reduction methods (e.g. provision of free condoms) can be employed.

During the study, it has been observed that the transgender subjects in the present study come from various social backgrounds and nationalities. It has been reported that undocumented migrants are less likely to seek medical attention, or acknowledge that they are HIV positive (Joint United Nations Programme on HIV/AIDS (UNAIDS) , 2014). Also, transgender sex workers from other countries did not practice safe sex, although outreach work was carried out on them as well (Teh, 2008). Detailed socio-demographic data may be required in future studies to determine the origin of the subjects, so that education and prevention methods on HIV/AIDS can be tailored accordingly, and their psycho-social problems can be dealt with more strategically. Transgender sex workers from foreign countries could be an important nidus for HIV transmission.

A high level of knowledge and a positive attitude towards HIV/AIDS will mean nothing if the transmission is stopped, or at least minimized. The needs of these transgenders should be addressed. Intervention programs should be targeted to this population, such as regular or routine screening tests for HIV infection and providing anti-retroviral therapy to HIV positive transgenders. More importantly, it should be emphasized that transgender workers should be informed on the skills to negotiate for condom use with their sex partners. Treatment compliance should also be enforced on those who are eligible for and also already on anti-retroviral therapy. As for healthcare

personnel, especially doctors, the transgender population must not be marginalized from the right of receiving medical care. Doctors and other healthcare personnel must be proactive in providing medical services towards these people, even if it means to serve this community down to the backstreet level. Treatment must be comprehensive and holistic, instead of disease-focused. Sensitive but dedicated and persistent approach must be used to encourage the transgenders to seek medical help.

Health education programs remain the main force for prevention and control of HIV infection. Throughout the history, ever since the discovery of HIV infection, strategies have been developed, refined, and improved to suit the interest of general public, so as to educate people on the importance of HIV/AIDS. The transgenders called on ongoing outreach, counselling, and educational programs to be carried out, together with support groups and the setup of drop-in centers (Teh, 2008). Since majority of the subjects in this study were Muslims, worked as sex workers, and had relatively low income, urgent attentions from religious bodies and non-government organizations are demanded to assist this population in terms of spirituality, employment, and financial support.

However, under all circumstances, abstinence is the best way to prevent HIV transmission. Authors from this study suggest that sex trade from the transgenders must be abolished *in toto*, by all means. Although transgender sex workers constitute a small population group, they are definitely exposed in high risk situations, and have an important role in HIV transmissions.

When approached by religious bodies, the transgender community might need to be advised on the importance of living a life according to the rulings of Syariah, so that they could attain a better quality of life. They might need to be reminded on the goodness of Solat (Muslim prayers). As the Holy Qur'an teaches Mankind, "Recite that which has been revealed to you of the Book and keep up prayer; surely prayer keeps (one) away from indecency and evil, and certainly the remembrance of Allah is the greatest, and Allah knows what you do." (*The Qur'an* 29:45)

Conclusion

In this study, it was found that the male-to-female transgenders in Kuantan mostly were younger adults, Muslims, and had completed secondary education. The majority of them sold sex, and earned low income. They demonstrated good knowledge and positive attitude towards HIV/AIDS and this is significantly associated with their level of education. Despite the positive outcome from this study, misconceptions towards HIV/AIDS still exist among this population. Transgenders must not be rejected from formal educations, and their needs must be addressed. Educations and interventions from multiple directions on HIV/AIDS are desperately needed to deliver the correct information this population efficiently, so as to emphasize prevention, early detection, and treatment of the infection. This marginalized population also requires attentions from religious bodies and non-government organizations to provide help in employment, financial, spiritual, and psycho-social issues.

Acknowledgement

Immense gratitude must be expressed to International Islamic University Malaysia for providing the resources for this study, to Mdm Mona Yap binti Abdullah from Centre for Languages and Pre-University Academic Development and Asst. Prof. Dr. Niza binti Samsuddin from the Department of Community Medicine for developing and verifying the translated questionnaire.

Conflict of interest

The authors in this study declare that there is no conflict of interest.

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Article History

Received: 15-10-2015
Accepted: 08-06-2016