



RESEARCH PAPER

OPEN ACCESS

Correlation of razor hygiene with HIV disease transmission risk in barber shop

Qomariyatus Sholihah*¹, Rahmi Fauzia²

¹Public Health, Faculty of Medicine, University of Lambung Mangkurat, Banjarbaru, Indonesia

²Psychology, Faculty of Medicine, University of Lambung Mangkurat, Banjarbaru, Indonesia

Key words: Knowledge, Attitude, Hygiene, Razor, HIV

<http://dx.doi.org/10.12692/ijb/9.6.383-392>

Article published on December 30, 2016

Abstract

The use of razors in turn often occurs in a common hair trimming. This could potentially lead to the transmission of disease. Transmission can occur through blood found on a razor, if not promptly cleaned after use. This study aimed to analyze the correlation between razor hygiene with HIV disease transmission risk. This study is observational analytic with cross sectional design. The sample in this study were all barber in Banjarmasin and Banjarbaru with 100 respondents. The research instrument was a questionnaire about knowledge, attitudes, razor hygiene and the risk of HIV transmission. Chi Square test results show there is a correlation of knowledge, attitudes and razor hygiene with the risk of HIV transmission. Multivariate analysis shows razor hygiene variables are variables that most influence on the risk of HIV transmission. Expected health workers can provide education about razor hygiene standards to the barber's, the community is expected to be more selective in choosing a barber shop that had a good razor hygiene.

*Corresponding Author: Qomariyatus Sholihah ✉ aprizalsatriahanafi@gmail.com

Introduction

Combating human immunodeficiency virus (HIV) is one of the goals of Sustainable Development Goals (UNDP Indonesia, 2015). Diseases associated with acquired immunodeficiency syndrome (AIDS) is one of the leading causes of death worldwide (Joint United Nations Programme, 2009). According to data of Ministry of Health in 2016 the current number of people living with HIV AIDS in Indonesia reached 291,465 people premises number of deaths totaled 14,234 people (Ministry of Health Republic Indonesia, 2016). Banjarmasin is the district/city that has a highest number of HIV/AIDS in South Kalimantan. The number of cases of HIV/AIDS in the city of Banjarmasin to date amounted to 480 cases, while 178 cases in Banjarbaru.

At first, the only known case of HIV through injection. Besides by injection, the risk of HIV transmission can occur through the drugs, the use of sharp objects that are not sterile like razors potentially transmit HIV (Khaliq and Smego, 2005). Using a razor blade turns in a barber shop also carries the risk of HIV transmission. This generally occurs in traditional barber shop in Indonesia. Usually barber using razor interchangeably without cleaning beforehand or without sterilized (Janjua *et al.*, 2004). Sterilization is important to prevent transmission of HIV. HIV is very sensitive to sterilization and disinfection to inactivate the virus.

Barbershop is one place using a razor without proper sterilization. Face and scalp customers can be scratched or cut by sharp instruments during shaved (Mutocheluh and Kwarteng, 2015).

Transmission is possible due to lack of hygiene shaving equipment. Sometimes barbers do not clean the razor immediately after use, though not everyone has a clean or health head. In addition, most barbers do not use disinfectant or soap when cleaning a razor, they simply wipe with plain cloth (Eltayeb and Mudawi, 2013). This raises the risk of disease transmission from one person to another and did not rule out infectious.

It certainly can be prevented if the equipment used is not used interchangeably or disinfection carried out on the razor after use soap or desinfectan (Biadgelegn *et al.*, 2012).

If razor carries blood containing the disease on the scalp of others, then it is very possible transmission of disease. Therefore, need to be aware if there is "little accident" in the form of injuries from razor cuts. Thus, if you want to cut hair, you should provide your own razors equipment. Transmission by contact of blood from an open wound, has not been widely known to the general public (Bawany *et al.*, 2014).

Hygiene procedures should be followed and implemented to prevent anything undesirable. Application of hygiene in a shaving kit is a series of activities to predict the likelihood or potential dangers that exist in a barber shop in particular health hazard, so it can look for ways to control hazards (Krishanani dkk, 2014).

A study in developed countries reported that 93% barbers have a high awareness about HIV transmission (Amodio *et al.*, 2010). While in Asia, only 50% of builders aware of the importance sterilized razor blade to prevent the transmission of HIV (Janjua *et al.*, 2010; Wazir *et al.*, 2008). Some barbers in Indonesia also did the shaving mustache, beard and others, which also has the risk of HIV transmission (Wazir *et al.*, 2008).

Therefore, this study was conducted to determine the knowledge, attitude and hygiene razor at barber in Banjarmasin and Banjarbaru. This research needs to be done, because so far most of the traditional barber shop is still the main choice for cutting hair, especially for men, but the attention to hair cuts as the transmission of HIV because not sterile razor equipment unnoticed.

Materials and methods

Study design

The research design used in this research is quantitative with descriptive analytic method. This study uses a cross-sectional study design, to determine the knowledge, attitudes, razor hygiene and HIV transmission risk in Banjarbaru and Banjarmasin.

Study population

The study population was the whole barber in Banjarbaru and Banjarmasin, South Kalimantan.

The research sample is hereinafter referred to as respondents are barber in Banjarbaru and Banjarmasin.

Jack E. Fraenkel and Norman E. Wallen states (though not absolute conditions) that the minimum sample size is 50 for co-relational study, 30 per group for the study of causal comparative. L.R. Gay in his Educational Research book states that for descriptive research sample size of 10% of the population, the correlation research 30 subjects, 30 subjects research causal comparative and experimental research 50 subjects.

Study instrument

Instruments in this study was a questionnaire. The questionnaire used in the study was a questionnaire on knowledge, attitudes, razor hygiene and the risk of HIV transmission to the customer of Barber at Banjarbaru and Banjarmasin. The independent variables in this study is the knowledge, attitudes and razor hygiene while the dependent variable is the risk of HIV transmission.

Data analysis

Data were collected immediately edited to examine the completeness of the data. Furthermore, data tabulated and analyzed using the Chi Square test with $\alpha = 5\%$ to see the correlation in knowledge, attitude, razor hygiene and the risk of HIV transmission.

Research was conducted in September 2016-Oktober 2016. Data were analyzed using univariate results of the questionnaire to determine.

The frequency distribution of each variable, bivariate analysis were used to analyze the differences knowledge, attitude, razor hygiene and the risk of HIV transmission. While multivariate analysis was performed using logistic regression test.

Results and discussion

Table 1 show that 43% of respondents aged between 30-40 years. 94% respondents were male, and 60% were junior school education. 72% of respondents have periode of working more than 5 years.

Research variables in this study are knowledge, attitudes, razor hygiene and the risk of HIV transmission. Overview of knowledge, attitudes, razor hygiene and the risk of HIV transmission as follows:

Distribution frequency of knowledge, attitude, hygiene razor and the risk of HIV transmission

Based on the results of questionnaires from 100 respondents, the obtained frequency distribution of knowledge, attitudes, razor hygiene and the risk of HIV transmission by respondents can be seen in table 2.

Based on table 2 shows the high and low knowledge among respondents is almost balanced, 48 people (48%) of respondents have a high knowledge and 52 (52%) had low knowledge.

Most respondents have a positive attitude towards the disease transmission through razor that 53 people (53%) and 47 (47%) of respondents have a negative attitude. Only 32 people (32%) of respondents who did complete disinfection after shave.

Respondents did disinfection using liquid soap containing phenol. Most respondents, 68 people (68%) do not perform disinfection after shave. High risk of transmission of disease 56%, while the low risk of transmission of diseases is 44%.

Correlation between knowledge and the risk of HIV transmission through razor

The bivariate analysis was performed using chi-square test to determine the correlation between knowledge (independent variable) with the risk of disease transmission of HIV (the dependent variable). The results of chi square test the knowledge of the risks of transmission of HIV disease can be seen in table 3.

The results of chi square test with 95% confidence level, to see the correlation of knowledge and the risk of HIV transmission obtained value of $p = 0.018$. From the p value ($p < 0.05$) means that there is a significant correlation between knowledge to the risk of disease transmission.

Table 1. Frequency Distribution of Respondents by Socio-Demographic.

Characteristics	Frequency	Percentage (%)
Age (Years)		
20-30	15	15
31-40	43	43
41-50	30	30
>50	12	12
Gender		
Male	94	94
Female	6	6
Education Level		
Elementary School	8	8
Middle School	60	60
High School	32	32
College	0	0
Periode of Working		
≤ 5 Years	28	28
> 5 Years	72	72
Total	64	100

Table 2. Distribution Frequency of Respondents by Knowledge, Attitude, Razor Hygiene and the Risk of HIV Transmission.

Variable	Frequency	Percentage (%)
Knowledge		
High	48	48
Low	52	52
Attitude		
Positive	53	53
Negative	47	47
Razor Hygiene		
Good	32	32
Not Good	68	68
HIV Transmission Risk		
High	56	56
Low	44	44
Total	100	100

Based on cross-tabulation table above can be seen from 48 respondents who have a high knowledge, 89.6% had a low risk of HIV transmission and of the 52 respondents who had low knowledge,

98.1% had a high risk of HIV transmission. Odds ratio value shows respondents who have low knowledge of 3.62 times the risk of disease transmission caused by razor.

Table 3. Correlation between knowledge and the risk of HIV transmission through razor.

No	Knowledge	HIV Transmission Risk		Total	p-value	OR
		High	Low			
1	High	5 (10,4%)	43 (89,6%)	48 (100%)	0,018	3,62
2	Low	51 (32,4%)	1 (67,7%)	52 (100%)		

Based on univariate analysis obtained 52% of respondents have a low knowledge. Lack of knowledge respondents are likely to be caused not yet been exposed to information about HIV/AIDS and the level of knowledge is still at the stage of understanding have not been through the stage of application, analysis, synthesis, and evaluation as described by Notoatmodjo (2011).

Knowledge is a very important aspect. With good knowledge, the barber can take action to prevent the transmission of diseases through razor (Esraa *et al*, 2015). Knowledge is one of the factors that encourage or stimulate the formation of healthy behaviors, if the barber to know and understand the impact and how to prevent transmission of disease through unsterilized razor,

barber will have good health behaviors, to avoid the risk of disease transmission through razor (Burke *et al.*, 2014).

In line with Wang *et al.* (2010), the better of knowledge about HIV will increasingly enable a person to assess his behavior, whether the behavior is risky to cause HIV infection or not. The ability to assess the risk of contracting will encourage the person's desire to prevent the risk factors of HIV transmission. This is consistent with the theory of the Health Action Model (Tones, 2004; Arulogun and Adesoro, 2009) which states, one of the factors that affect the goals of a health behavior of a person is knowledge. Knowledge about HIV, modes of transmission and prevention methods that will make the barber and customers to assess the risk of HIV transmission. So that the better a person's knowledge about HIV will affect a person's decision to take steps to prevent transmission (Brewer, 2012).

Notoatmodjo (2011) says knowledge is the cognitive domain which is very important in shaping a person's actions. If the acceptance of new behavior or adoption of behavior based on the knowledge, then what is learned, among others, the behavior will be permanent, otherwise if the behavior was not based on the knowledge it will not last long. This means, if the better of respondents' knowledge about HIV/AIDS, it will influence the actions to maintain razor hygiene to prevent the risk of transmission of HIV/AIDS.

In determining the attitude of the whole, knowledge, thoughts, beliefs, and emotions play an important role. Based on the theory of adaptation, if the level of knowledge both at least can push to have a good attitude and behavior. With a good knowledge about HIV/AIDS awareness will be formed to maintain razor hygiene (Haroun *et al.*, 2016).

Lack of socialization provided knowledge about the HIV virus causing the majority of Indonesian people in general still do not know the mode of transmission of HIV virus. Some people still think that HIV is only transmitted through sexual contact and injecting drug user, and there are many people who thought HIV could be transmitted only through a handshake or alternately tableware (Wang *et al.*, 2013).

Many misconceptions in the community that HIV easily spread through the air, clothing or equipment used together. But actually only live HIV virus in body fluids are blood, semen, vaginal fluids and breast milk. HIV virus can only infect via direct or direct transmission of infection. Moreover, that HIV virus is only able to survive in the body of its host only (Politch *et al.*, 2013).

Time of death this virus sooner or later depending on the dryness of media introduction of the virus, in this case is the blood. For example, if there is a drop of blood of people with HIV fell to the floor and dry instantly, along with drying blood, the HIV virus also die. This virus is not easy to survive outside its host's body has dismissed the notion that HIV/AIDS can be transmitted easily (Paintsil *et al.*, 2013).

HIV can also be transmitted through the use of the same objects like razors can also transmit HIV. Get used to having a toothbrush and razor itself, because in addition to personal hygiene, if there is a risk of transmission of blood appears another virus through the bloodstream (such as hepatitis), not just the HIV virus (Haffejee *et al.*, 2016).

Chance of transmission per one contact with a number of cases currently experiencing a different composition. For example, transmission through blood transfusion despite the high odds, but in fact such cases are very rare, because of transmission through blood transfusion can be controlled through the process of screening blood donors beforehand (John, 2011). If found blood containing the HIV virus during the screening process, then the blood will not be used for blood transfusions (Chaurasia *et al.*, 2014; Shitu *et al.*, 2014). Instead, transmission through the razor is still a serious concern for everyone. Use of alternately razor at the barber can increase the risk of HIV transmission, as in the daily life of people living with HIV/AIDS is also a hair cut at a barber same as ordinary people. This allows the transmission of HIV through the razor, remember everyone is entitled to use the services of barber (Alinaghi *et al.*, 2014).

Correlation between attitudes and the risk of HIV transmission through razor

The bivariate analysis was performed using chi-square test to determine the correlation between attitudes (independent variable) with the risk of disease transmission of HIV (the dependent variable). The results of chi square test the attitudes of the risks

of transmission of HIV disease can be seen in table 4. The results of chi square test with 95% confidence level, to see the correlation of attitudes and the risk of HIV transmission obtained value of $p = 0.021$. From the p value ($p < 0.05$) means that there is a significant correlation between attitudes to the risk of disease transmission.

Table 4. Correlation between attitudes and the risk of HIV transmission through razor.

No	Attitudes	HIV Transmission Risk		Total	p-value	OR
		High	Low			
1	Positive	12 (22,6%)	41 (77,4%)	53 (100%)	0,021	5,33
2	Negative	44 (93,6%)	3 (6,4%)	47 (100%)		

Based on cross-tabulation table above can be seen from 53 respondents who have a positive attitude, 77.4% of them had a low risk of disease transmission and from 47 respondents who have a negative attitude, 93.6% of them had a high risk of disease transmission. Odds ratio value shows respondents have a negative attitude 5.33 times the risk of transmission of diseases caused by razor.

Attitude is the response to the stimulus person against a particular object, which involve opinions and emotional factors. Attitude is a form of psychological state. Attitudes changed according to the surrounding circumstances. The steps in changing attitudes, awareness and understanding of the subject to the stimulus can be either communication or message delivered (Rahayu, 2010).

The attitude is a reflection of the knowledge. In this study, the attitude is related to attitude in preventing the risk of transmission of HIV/AIDS through the razor. All the tools that penetrate the skin, including razor used interchangeably between one person and another person.

Moreover, the person was known to suffer from AIDS (Karami *et al.*, 2015; Ramadurg *et al.*, 2013). In general, the major signs visible to someone on the stage of AIDS include the weight decreased by more than 10 percent in a short time, prolonged high fever (over a month), and prolonged diarrhea anyway (Cohen *et al.*, 2010; Jeevani, 2011).

HIV infection through razors can occur if there is blood from HIV patients. Indeed, until now there is no strong evidence to prove this. However, the risk of transmission is still present albeit small. If it is mentioned 'razor hair' as a medium of transmission of HIV. Then it is a form of moralizing the behavior of some people with HIV/AIDS. As HIV patients should pay more attention to the state of self in order not to transmit the disease to others, for example by shaving with a personal razor.

According to Kambu research (2012), a good attitude tends to have a good awareness of action to prevent HIV transmission. While the not good attitude will have implications for the prevention of HIV transmission waiver so that the risk of transmission will increases.

A positive attitude and awareness of the importance of preventing HIV infection is critical grown in the community to prevent and suppress the rate of HIV transmission. When a person (not just people with HIV who have not been identified) has been aware of the impact of HIV infection, then they will always try to avoid the slightest risk of HIV transmission, including through alternately razor (Verma *et al.*, 2014).

Correlation between razor hygiene and the risk of HIV transmission through razor

The bivariate analysis was performed using chi-square test to determine the correlation between razor hygiene (independent variable) with the risk of disease transmission of HIV (the dependent variable). The results of chi square test the razor hygiene of the risks of transmission of HIV disease can be seen in

Table 5. Correlation between razor hygiene and the risk of HIV transmission through razor.

No	Razor Hygiene	HIV Transmission Risk		Total	p-value	OR
		High	Low			
1	Good	3 (9,4%)	29 (90,6%)	32 (100%)	0,000	3,36
2	Not Good	53 (78%)	15 (22%)	68 (100%)		

The results of chi square test with 95% confidence level, to see the correlation of razor hygiene and the risk of HIV transmission obtained value of $p = 0.000$. From the p value ($p < 0.05$) means that there is a significant correlation between razor hygiene to the risk of disease transmission.

Based on cross-tabulation table above can be seen from 32 respondents who had a razor good hygiene, 90.6% of them have an increased risk of disease transmission through the razor is low and of 68 respondents who have no razor good hygiene is not, 78% of them have a risk of disease transmission through high razor. Odds ratio value indicates that respondents have a razor hygiene is not good, 3.36 times the risk of transmission of diseases caused by razor.

Once exposed to air, any blood left on the razor will dry. This will eliminate the risk of HIV transmission. It is important to note that scientists have found blood on the razor may pose a risk of hepatitis transmission (Mutocheluh and Kwarteng, 2015).

Because there are other bacterial and viral infections, including hepatitis or HIV, which sometimes can be transmitted through turns razor, but it is more prudent to avoid the use of razor together to eliminate the risk of disease transmission (Otokpa dkk, 2013).

When the blood of a person infected with HIV, it is very likely to transmit HIV, although only in a little amount of blood.

So it's important to never share anything like razors that allow risk to the virus enters the bloodstream (Brewer *et al.*, 2012). The case study of the razor contribute to the transmission of hepatitis B,C and HIV. Sharing razors have also been known to cause transmission of fungal infection tinea corporis-specifically, more commonly known as ringworm and bacterial infections (Rabbei *et al.*, 2012).

Procedures using a razor is used on more than one person will carry the risk of HIV transmission because it will allow infected blood on the razor. Hairdresser or barber must have knowledge about the risk of disease transmission through the razor so that they can perform the proper precautions. According Djoerban (1999) all tools that penetrate the skin and the blood such as needles, tattoo needles and razor blades should be sterilized in the right way.

Sterilization or disinfection process is very important to keep clean razor for used interchangeably (Biadgelegn *et al.*, 2012). The process has the risk of bleeding shaved scalp. Blood comes out very easily transmit disease. Therefore, proper sterilization processes important to do (Kitara *et al.*, 2011). Sterilization of shaving can be done by washing with a solution of NaClO (Chlorine) 5% and water at a ratio of 1 part chlorine and 9 parts water. Chlorine working power solution will rapidly decrease and should be replaced at least every 24 hours or sooner if it appears to have dirty or muddy (Saiman *et al.*, 2014). Sterilization can also be performed using liquid Hydrogen Peroxide (H₂O₂) with high levels of 3% or 70% alcohol content or liquids containing phenol 5% (Linley *et al.*, 2012).

The most influential independent variables with the dependent variable

Multivariate analysis using logistic regression test to determine the independent variables were the dominant influence on the dependent variable. The results of logistic regression test can be seen in table 6.

Table 6. The independent variables that most influence to the dependent variable.

Variable	B	P Value	OR
Knowledge	0,773	0,067	0,21
Attitudes	0,923	0,139	1,12
Razor Hygiene	1,438	0,032	2,45

The results of logistic regression test with a confidence level of 95%, shows the variables that most influence to the dependent variable in this study is the variable of razor hygiene. This is seen by the significant value of 0.032. Hygiene razor is a variable that has the most close correlation to the risk of disease transmission through the razor. It is based on the results of multivariate analysis shows that significance value of razor hygiene variable (<0.05). Odds ratio value of razor hygiene is 2.45 means not good razor hygiene is a risk of spreading the disease through razor 2.45 times larger than the razor that have good hygiene.

Conclusions

Based on the results of research there are significant correlation of knowledge, attitudes and razor hygiene with the risk of HIV transmission. Variable of razor hygiene is the independent variable most dominant influence to the risk of disease transmission through razor with odds ratios of 2.45. Based on the distribution frequency of respondents by razor hygiene known that most barbers do not know a risk of disease transmission, including HIV through unsterilized razor. So make the most of barber do not sterilizing a razor after used.

Acknowledgements

Praise and gratitude to Allah for all the blessings. Thanks to the University of Lambung Mangkurat who have to provide financial support in this study. Thanks to all the respondents who have contributed in this study.

Competing interest

Both authors declare that they have no conflict of interest in this article.

References

Alinaghi SAS, Sadrizadeh B, Mohraz M, Gouya MM, Sedaghat A, Nadim A, Samaei M, Ardakani HM. 2014. A study of the knowledge on HIV in regards to routes of transmission and sexual practices in men between the ages of 20 to 50 in Tehran. *Asian Pacific Journal of Tropical Disease* 4 (Suppl 2). S621-S623. DOI: 10.1016/S2222-1808(14)60691-5.

Al-Rabbei NA, Al-Thaifani AA, Dallak AM. 2012. Knowledge, attitudes and practices of barbers regarding Hepatitis B and C viral infection in Sana'a City, Yemen. *Journal of Community Health* 37(5), 935-939.

DOI: 10.1007/s10900-011-9535-7.

Amodio E, Di Benedetto MA, Gennaro L, Maida CM, Romano N. 2010. Knowledge, attitudes and risk of HIV, HBV and HCV infections in hairdressers of Palermo city (South Italy) *Eur J Public Health* 20, 433-7.

Arulogun OS, Adesoro, MO. 2009. Potential risk of HIV transmission in barbering practice among professional barbers in Ibadan, Nigeria. *African Health Sciences* 9(1), 19-25.

Bawany FI, Khan MS, Shoaib AB, Naeem M, Kazi AN, Shehzad AM. 2014. Knowledge and practices of barbers regarding HIV transmission in Karachi: A cross sectional study. *Journal of Community Health* 39(5), 951-955.

DOI: 10.1007/s10900-014-9835-9.

Biadagegn F, Belyhun Y, Anagaw B, Woldeyohannes D, Moges F, Bekele A Mulu A. 2012. Potential risk of HIV transmission in barbering practice in Ethiopia: Form public health and microbiological perspective. *BMC Public Health* 12, 707.

DOI: 10.1186/1471-2458-12-707.

Brewer DD. 2012. Knowledge of specific HIV transmission modes in relation to HIV infection in Mozambique [version 1; referees; 2 approved, 1 not approved]. *F1000 Research* 2012 1(1), 1-5.

DOI: 10.12688/f1000research.1-1.v1.

Burke RM, Leon JS, Suchdev PS. 2014. Identification prevention and treatment of iron deficiency during the first 1000 days. *Nutrients* 6(10), 4093-4114.

Chaurasia R, Zaman S, Das B, Chatterjee K. 2014. Screening donated blood for transfusion transmitted infections by serology along with NAT and response rate to notification of reactive results: An Indian experience. *Journal of Blood Transfusion*, 2014, 1-7.

DOI:org/10.1155/2014/412105.

- Cohen MS, Gay CL, Busch MP Hecht FM.** 2010. The detection of acute HIV infection. *The Journal of Infectious Disease* **202(S2)**, S270-S277.
DOI: 10.1086/655651.
- Djoerban Z.** 1999. Targetting AIDS: Endeavor Understanding HIV and people living with HIV. Yogyakarta: Galang Press Yogyakarta.
- Eltayeb NH, Mudawi HMY.** 2013. Knowledge and practice of barbers regarding transmission blood-borne viruses in Khartoum State. *Annals of Tropical Medicine and Public Health* **6(1)**, 80-83.
- Esraa BA, et al.** 2015. Assessment of Iron and Calcium Supplements Compliance among Pregnant Women Attending Antenatal Care Unit of Al-Sabah Bnaat Primary Jhealth Care Unit in Ismailia, Egypt. *Journal of Medical Biological Science Research.*, **1(3)**, 24-29.
- Haffejee F, Ports KA, Mosavel M.** 2016. Knowledge and attitudes about HIV infection and prevention of mother to child transmission of HIV in an urban, low income community in Durban, South Africa: Perspective of residents and health care volunteers. *Health SA Gesondheid*, **21**, 171-178.
DOI.org/10.1016/j.hsag.2016.02.001.
- Haroun D, Saleh OE, Wood L, Mechli R, Al Marzouqi N, Anouti S.** 2016. Assesing knowledge of, and and attitudes to,HIV/AIDS among University Students in the United Arab Emirates. *Plos One* **11(2)**, 1-11.
DOI:10.1371/journal.pone.0149920.
- Janjua NZ, Nizamy MA.** 2004. Knowledge and practices of barbers about hepatitis B and C transmission in Rawalpindi and Islamabad. *J Pak Med Assoc* **54**, 116-9.
- Jeevani T,** 2011. Symptoms aof AIDS related opportunistic infections and their effects on human body. *Journal of AIDS and Clinical Research* **2(6)**, 1-5.
DOI:10.4172/2155-6113.1000132.
- John TJ.** 2011. Towards zero transmission of HIV through blood transfusion. *Indian Journal of Medical Research* **134(6)**, 746-748.
- Joint United Nations Programme on HIV/AIDS AIDS.** 2009. epidemic update. Geneva: Joint United Nations Programme on HIV/AIDSp. 99.
- Kambu Y.** 2012. Analysis of Factors Affecting Precautions HIV transmission by people with HIV in Sorong. Thesis. Depok: Faculty of Nursing, University of Indonesia.
- Karami A, Ghidari PS, Miandari A, Shoghli A, Farhood GK.** 2015. Assess the Knowledge and Attitude of Barbers Toward HIV/AIDS Infection. *Biosci Biotechnol Res Asia* **12(3)**.
DOI: <http://dx.doi.org/10.13005/bbra/1901>.
- Khaliq AA, Smego RA.** 2005. Barber shaving and blood-borne disease transmission in developing countries. *S Afr Med J.* **95**, 94-96.
- Kitara DL, Obol JH, Carlos J, Sumayiya N, Olando K.** 2011. Barbers' activities in the main streets of Gulu, Northern Uganda: Implication for HIV transmission. *Journal of Medicine and Medical Sciences* **2(9)**, 1114-1122.
- Krishanani MK, Ali FA, Late AKK, Qidwai W, Ali BS.** 2014. Educational intervention among barbers to improve their knowledge regarding HIV/AIDS: A pilot study from a south asian country. *Journal of Health, Population and Nutrititon* **32 (3)**, 386-390.
- Linley E, Denyer SP, McDonnell G, Simons C, Maillard JY.** 2012. Use of hydrogen peroxide as a biocide: new considration of its mechanisms of biocidal action. *Journal of Antimicrobial Chemotherapy*, April 1-8.
DOI:10.1093/jac/dks129.
- Ministry of Health Republic Indonesia.** 2016. Data HIV dan AIDS Tahun 1987-Direktorat Jenderal Pengendalian dan Pemberantasan Penyakit.

- Mutocheluh M, Kwarteng K.** 2015. Knowledge and occupational hazards of barbers in the transmission of Hepatitis B and C was low in Kumasi, Ghana. *Pan African Medical Journal* **20 (260)**, 1-7. DOI:10.11604/pamj.2015.20.260.4138.
- Notoatmodjo.** 2011. *Public Health: Science and Art*. Jakarta : Rineka Cipta.
- Otokpa AO, Lawoyin TO, Asuzu MC.** 2013. HIV/AIDS-related knowledge and misconceptions among women attending government-owned antenatal clinics in Gwagwalada area Council of Abuja, Nigeria. *African Journal of Reproductive Health*, **17(1)**, 114-121.
- Paintsil E, Binka M, Patel A, Lindenbach LD, Heimer R.** 2013. Hepatitis C virus maintains infectivity for weeks after drying on onanimate surfaces at room temperature: implications for risks of transmission. *Journal of Infectious Disease Advance Access*, December 1-7. DOI: 10.1093/infdis/jit648.
- Politch JA, Marathe J, Anderson DJ.** 2013. Characteristics and quantities of HIV host cells in human genital tract secretions. *The Journal of Infectious Disease* **210(3)**, S609-S615.
- Rahayu RNB** 2010. *Effect of 5A Methods to the Attitudes of Smoking*. Thesis, Surakarta: Progam Study of Master of Family Medicine. University of Sebelas Maret.
- Ramadurg UY, Manjual R, Mayappannavar R, Ghattargi CH, Kulkarni P.** 2013. Awareness among barbers about health hazards associated with their profession in Bagalkot, Karnataka. *International Journal of Research and Development of Health*, **1(2)**, 77-84.
- Saiman.** 2014. Infection prevention and control guideline for Cystic Fibrosis: 2013update. *Infection Control and Hospital Epidemiology* **35(S1)**, S1-S67. DOI: 10.1086/676882.
- Shitu AO, Olawumi HO, Adewuyi JO.** 2014. Pre-donation screening of blood for transfusion transmissible infections: the gains and the pains-experience at a resource limited blood bank. *Ghana Medical Journal* **48 (3)**, 158-162.
- Tones K, Jackie G.** 2004. *Health Promotion: Planning and Strategies*. London: Sage Publication.
- UNDP.** 2015. *Konversi agenda pembangunan: Nawa Cita, RPJMN and SDGs*. http://infid.org/wp-content/uploads/2015/11/FA_PANDUAN-SDGs-print-web-ok.pdf. Accessed: 18 December 2016.
- Verma RK, Wong S, Chakravarthi S, Barua A.** 2014. An assessment of the level of awareness, attitudes, and opinions of the medical students concerning HIV and AIDS in Malaysia. *Journal of Clinical & Diagnostic Research* **8(4)**, HC10-HC13. DOI: 10.7860/JCDR/2014/7829.4286.
- Wang G, Wada K, Hoshi K, Ezoe S, Satoh T.** 2013. Association of knowledge of HIV and other factor with individuals' attitudes toward HIV infection: A national cross sectional survey among the Japanese non-medical working population. *Plos One* **8(7)**, 1-8. DOI:10.1371/journal.pone.0068495.t001.
- Wang Y, Pan JB, Wang XF, Li B, Henderson G, Emrick CB, Sengupta S, Cohen M.** 2010. Reported Willingness and Associated Factors Related to Utilization of Voluntary Counseling and Testing Services by Female Sex Workers in Shandong Province, China. *Biomedical and Environmental Sciences* **23(6)**, 466-472. DOI: 10.1016/S0895-3988(11)60009-3.
- Wazir MS, Mehmood S, Ahmed A, Jadoon HR.** 2008. Awareness among barbers about health hazards associated with their profession. *J Ayub Med Coll Abbottabad* **20**, 35-8