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Risk Factors for Contacting HIV/AIDS among Health Care Workers in Peri Uban-Hospitals in Kumasi, Study Conducted at Suntreso Hospital

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Abstract

Health workers are vulnerable to occupational exposure to contagious substances and stand the risk of acquiring life threatening disease. The study assessed risk factors for contracting HIV AIDS by healthcare workers in the three Peri-Urban Hospitals in Kumasi. The study was quantitative employing cross-sectional survey. Data was collected from 210 randomly selected healthcare workers from the three hospitals who were directly involved in given medical care to patients. Questionnaire and interview were the instruments employed in data gathering. The questionnaire was administered; key informant interview was conducted among healthcare practitioners. Study revealed that HIV AIDS transmission in the hospitals emanates from several factors. The major cause of HIV AIDS transmission was found to be percutaneous exposure. The items measuring percutaneous exposure all had high mean scores and relative importance indexes above 50%, indicating that they are risk factors. Injuries from needle and sharp devices contributed 80% of the risk. The study identified modifiable factors found that promotes HIV AIDS transmission in the hospitals to be, non-use of safety devices, complacency, inattentiveness, negligence, and health and safety delivery rules and policies. The study discovered that healthcare workers exposed to the risk factors receive inadequate post exposure prophylaxis. A single dose therapy regimen is administered to healthcare worker who have encountered percutaneous and mucocutaneous exposures. The study provides useful information to hospital authorities and health personnel to work in an environment risk-free. Systematic risk factors, particularly percutaneous exposure should be a prime concern to healthcare practitioners in the hospitals.

Introduction

HIV AIDS menace is an internationally concerned problem; the disease is catastrophically spreading throughout the world. The disease was first diagnosed in the 1980s among some homosexuals in Chicago in United State of America (Amosu *et al*., 2011). According to Buston and Engelkirk (2000), HIV AIDS has gradually become a great killer; it has invaded mankind universally because of the absence of absolute cure. Initially, the disease was spreading at the rate of over 10,000 new cases per day (Quinn, 1996). But the effort to curtail the spread has reduced the spread significantly. Monasch and Mahy (2006) indicate in their estimation that 5000 – 6000 new infections occur each day, of which Sub-Saharan Africa alone comprise the majority of people living with HIV AIDS. Plethora of literature points out that over 21 million out of people infected with the disease have died worldwide (Cambridge, 1996; WHO, 2000; AIDSMAP, 2001). Cambridge (1996) adds that adults who got infected in 2000 amount to over 60 million, with 63% coming from Sub-Saharan Africa. A projected number of persons living with HIV and AIDS in Ghana according to a survey report was 217, 428, made up of 124, 411 females and 93, 017 males with annual AIDS death of 14,330 (Ghana Health Service, 2012). The national HIV incidence and AIDS estimates report project an increase of 221, 884 by 2015. To prevent HIV prevalence, the National Strategic Plan of Ghana Health Service presents interventions to be undertaken by hospitals (Ghana Health Service, 2012).

Problem statement

The growth of an economy depends on the health of its citizenry; because a healthy worker is productive than an unhealthy worker. Therefore, health care workers play significant role in the economic development of a country. They perform key social roles and are resources for producing good health for the country. Unfortunately, the catastrophic spread of HIV AIDS is reducing the already inadequate workforce in the country. With the emergence of HIV AIDS, the health workers have been vulnerable to occupational exposure to contagious materials and stand the risk of acquiring life threatening disease. The workers are increasingly being exposed to patients with HIV infections and AIDS.

Health care workers are among the people in the society who are constantly exposed to blood and other body fluids. Patients who visit hospitals with all kinds of diseases may have the agent of disease present in their blood. Even though precautionary measures are observed, health care workers are likely to accidentally be exposed to blood or potentially infectious materials. In this case, the infectious agent is transferred into their body; get infected and their lives become endangered or ruined.

Existing solution

HIV AIDS is a disease with no cure; there is no any effective vaccine for it. Notwithstanding the situation, the spread is so alarming such that health practitioners, international bodies, NGOs among others are always finding and reporting ways to reduce if possible eliminate the disease. The tendency of health care workers to contract the disease has as well been captured. The study identifies several risk factors of HIV infection among health care workers. With this, hospital authorities can develop or revise the interventions to match up with each risk factor effectively.

The HIV transmission depends to great extent the level of knowledge and kind of medical practices observed by health care workers in the hospitals. The study will identify practices which are risky and exposed health care workers to HIV infection. Through the study health care workers will get to know good and bad practices and make conscious effort to refrain from medical practices that are risky and prone to HIV infection.

Best solution

A comprehensive review of post-exposure prophylaxis will serve as guide to deal with post-occupational exposure to HIV to stop multiplication of the initial inoculums of virus and thereby preventing formation of chronic HIV infection. The result of the findings will aid in effective measures to deal with and manage occupational exposure to HIV AIDS in the hospitals.

Since the result is based on a sample, the result may not be the same if entire population was used. Cross-sectional study did not permit an investigation on the level of risk associated with the study variables, systematic and modifiable factors.

The following are the limitations of the study

a. Since the result is based on a sample, the result may not be the same if entire population was used.
b. Cross-sectional study did not permit an investigation on the level of risk associated with the study variables, systematic and modifiable factors.

Generally, the study seeks to assess the risk factors for contracting HIV AIDS by health care workers of public hospitals. However, specific ones include,

i. To measure the level of knowledge of health care workers about the risk factors for HIV transmission
ii. Examine how the interventions put in place by management to prevent HIV infection are observed by the health workers.
iii. Evaluate post exposure regimen given to infected health care worker.

Methodology

The study was carried out in three public hospitals in Kumasi namely, Chapatre Hospital, Tafo General Hospital and Suntreso Hospital. These hospitals were considered for the study in order to ascertain fair view of risk factors. These hospitals were considered for the study because they are the designated HIV/AIDS Centre in the Kumasi Metropolis. The number of HIV AIDS and other infectious diseases handle by these hospitals vary and the variation gives a true picture of a diverse health care practices exhibited in the public hospitals. It is therefore worthwhile to combine these hospitals for a study of this nature.

As a cross-sectional survey design, using questionnaire was the primary data collection technique for gathering data. It allowed collection of large amounts of information at a low cost (Kumar, 2005). The questions on HIV AIDS risk factors and treatment were developed out of the literature reviewed in chapter two. The questionnaire consisted of four parts: demography of participants; knowledge about HIV AIDS, risk factors and post exposure treatment. The questionnaire consisted mainly of closed questions requiring 'tick', however, few open-ended questions were included to encourage 'unaided recall' responses (Saunders *et al*., 2007); and participant's personal views and feelings (Kumar, 2005) on risk factors and post exposure treatment of HIV AIDS.

Mixed research method was seen as an appropriate and relevant design for a study of this kind whose overall goal was to identify occupational risk factors of HIV transmission. The mixed method allows easy handling of complex data and provides more perspectives on the problem being studied (Hesse-Biber, 2010). According to Saunders *et al*. (2007), survey is efficient and effective for collecting large data from large sample and enables quantitative data analysis using descriptive and inferential statistics. Hence, a cross-sectional survey design which employs a combination of data gathering methods including questionnaire administration and interviews were used to collect data on occupational exposure and post exposure regimen to HIV AIDS.

The developed questionnaire was pilot tested among nine HIV AIDS experts, three from each of the selected hospitals. The responses were desk checked and revised to take care of all the ambiguity to ensure clarity, precision and coherency. The questionnaire was edited and finalized for the actual field work.

The collected instruments were sorted out to remove wrongly filled instruments, coded and then entered into SPSS for analysis. Correlation analysis was performed to ascertain the relationship and effect of the independent variables on the dependent variable. Descriptive statistics with graphs was performed to rate the risk factors using Microsoft excel. The relative importance index was computed to establish the magnitude of the measurement items. By this, the variable items and their proportionate contribution each made to the study phenomenon were determined.

Discussion of findings and results

The findings are organized and presented in the form of frequency distributions, descriptive statistics, chart and tables to enable examination and description on the patterns of the responses

In order to ascertain the level of knowledge on HIV AIDS, basic knowledge about the disease, the causes, existence and mode of transmission were examined. As the literature indicated that HIV AIDS is a viral disease and spread through blood and body fluids, it was important that participants were examined. As health care practitioners, it was expected that all of the participants could agree that HIV AIDS is caused by exposure to blood and body fluid. However, a fraction (3.3%) of the participants disagreed, suggesting that not all of the health care workers have full knowledge on the disease. Meanwhile, Young *et al*. (2007) and M'ikanatha *et al.* (2007) state categorically that blood and body fluids were not just mere factors but main contributors of HIV AIDS infection. It suggests that handling of blood and body fluids in the hospital need special care and attention. In fact, blood and body fluids are substances so common and worked on in the hospitals; they use them very often for different kinds of diagnoses. Practices like injection, fusion, laboratory analysis, and surgical activities expose health care workers to blood and body

fluids. Because of lack of knowledge on the main causative agents of HIV AIDS infection, handling of blood and body fluids is likely to be done anyhow. It is only when there is awareness and knowledge that handling of such substances would be done meticulously. Unfortunately, hospitals employ both skilled and unskilled workforce performing various activities from cleaning to medication duties based on their job description. As they perform the duties, health care workers are likely to be exposed to blood and body fluids in one way or the other. On the issue of the existence of HIV AIDS disease, participants were fully aware of it. The response confirms several reports which have established that HIV AIDS has existed for considerable years and have been spreading astronomically killing thousands of people (Amosu *et al*., 2011; Quinn, 1996; Buston and Engelkirk, 2000). Even though participants knew the existence of the disease, quite a number of the interviewees could indicate the types as distinguished in the literature (HSE, 1995) as Type 1 and Type 2. As part of knowledge, the survey wanted to establish whether HIV AIDS could be cured. A response of 3.3% indicated that the disease was curable, and that AIDS drugs could cure it.

Health care workers are expected to exhibit certain behaviours that would not put them at risk but rather prevent them from any form of infections. According to the literature, there are acceptable behaviours and unacceptable behaviours at work place. One of the acceptable behaviours is the assumption that every blood and other body fluids from all patients is potentially infectious (CDC, 2011). With this in mind, the worker would be extremely careful in handling it. Notwithstanding, survey findings identified behaviours which were susceptible to infections at the hospitals. Among the unacceptable behaviours identified, non-use of protective materials during health administration was found to be prevalent and leading. This is followed by failing to use sterilize devices; negligence, complacency and over-zealous were the least rank misbehaviors at the hospitals. These negative attitudes and behaviours pose as threats of HIV transmission at the hospitals.

Demography of participants

Table 4.1. Demographic characteristics of participants (Source: Field survey, 2014)

Item	Frequency, N=210	Percentage %
Profession		
Medical Doctor		
Nurse	35	16.7
Midwife	133	63.3
Lab Scientist	14	6.7
Other	21	10.0
Working Department		
Laboratory	28	13.3
Injection	28	13.3
Theatre	35	16.7
Male Ward	49	23.3
Rank		
Rotational Nurse	76	36.2
Nursing Officer	42	20.0
Snr. Nursing Officer	56	26.7
Jnr. Nurse Officer	21	10.0
Other (Snr. /Jnr. Medical Officer, Health Assist.)	15	7.10

Working Years		
Less than a year	14	6.7
1 – 3 years	42	20.0
4 – 7 years	80	38.1
7 years above	74	35.2

Participants' bio-data were sought on profession, gender, working status, work experience working department and educational level. Table 4.1presents the demography of participants who were selected for the study.

Based on Table 4.1, participants who filled the questionnaire had varied characteristics. In terms of profession, 16.7% were medical doctors, 63.3% were nurses, 6.7% were midwives, 10% were lab scientists and 3.3% were other representing pharmacists and administrators. The working department of the participants indicated that 13.3% worked in the laboratory and injection department respectively, 16.7% worked at the theatre, 23.3% worked at male ward and 33.3% worked at female ward.

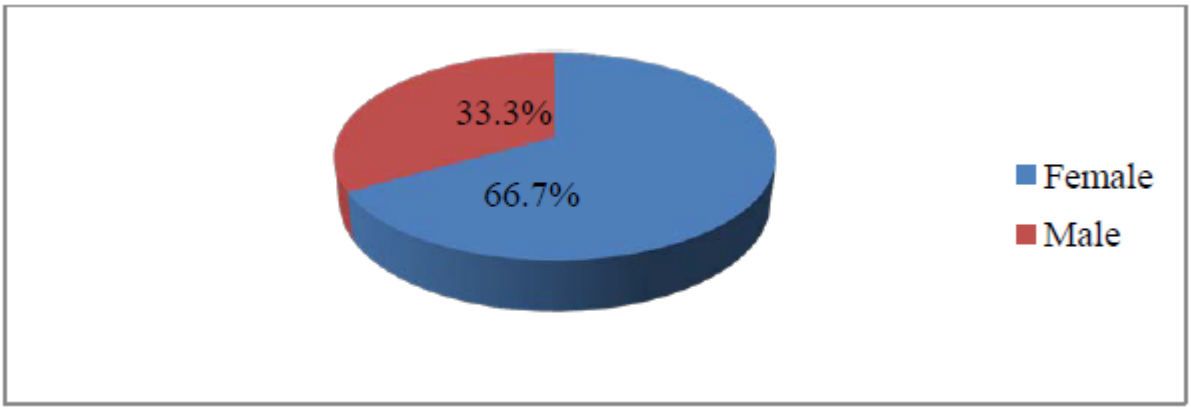

Figure 4.1. Gender of participants (Source: Field survey, 2014)

From the Table, 66.2% of the participants in the hospitals by their position suggested that they were greatly involved in various health care activities. Again, looking at the profession and the departments of participants, it was clear that they were exposed to all manner of fluids such as blood, urine and saliva making them susceptible to HIV and as such appropriate respondents for a study of this nature. The bio-data of the participants suggests that the questionnaires were filled by participants who were knowledgeable. Hence, the responses can be said to be reliable and that the information is the true reflection of the situation pertaining in the hospitals understudied.

HIV/AIDS transmission

The study sought to find out how HIV is transmitted in the health care setting. The study first ascertained the knowledge level of health workers and the risk factors of the HIV AIDS disease.

Knowledge about HIV AIDS transmission

Participants knowledge about the disease was ascertain. Several questions were asked and participants were asked to indicate their level of agreement with the statements by ticking from a scale of 1-4, where 1= strongly agree (SA), 2=agree (A), 3=disagree (D) and 4=strongly disagree (SD), a number that reflected on their answer (See Table 4.2 for detail responses.

Table 4.2. Knowledge about HIV AIDS - SA (1); A (2); D (3); SD (4) (Source: Field survey, 2014)

SR No.	Item/Question	Frequency (%)				
		SA	A	D	SD	Total
1	AIDS is caused by a virus	93.3	6.7	-	-	100
2	HIV AIDS can be transmitted to health care workers through blood and body fluid	90.0	6.7	-	3.3	100
3	HIV/AIDS can spread through touching and hugging, saliva, cough and sneezing, urine and faeces.	10.0	26.7	40.0	23.3	100
4	HIV/AIDS can be transmitted through insect bite	-	-	73.3	26.7	100
5	AIDS can be cured	-	3.3	60.0	36.7	100
6	HIV AIDS can be prevented through vaccination	13.3	3.3	53.3	30.0	100
7	Blood transfusion can transmit HIV	80.0	20.0	-	-	100
8	Persons with HIV can be asymptomatic but still infectious	60.0	36.7	-	3.3	100
9	AIDS drugs only subside the disease	46.7	50.0	3.3	-	100
10	AIDS drugs are readily available	56.7	30.0	6.7	6.7	100
11	AIDS drugs are expensive	10.0	23.3	46.7	20.0	100

Table 4.3. Percutaneous exposures and their ratings (Source: Field survey, 2014)

SR No.	Item/Question	Mean	Standard Deviation	RII	Rating
1	An exposure to superficial injury or solid injury	2.53	1.12	0.64	**6th**
2	Skin puncture	2.83	1.35	0.71	**4th**
3	Visible blood on an instrument (needle, sharp device)	3.20	1.20	0.80	**1st**
4	Blood collection with hollow bore needles	3.03	1.28	0.76	**2nd**
5	Procedure involving needle placed in a vein or artery of a patient	2.73	1.29	0.68	**5th**
6	Injection into the body	2.83	1.35	0.71	**4th**
7	Intravenous or intramuscular injection of contaminated blood	2.90	1.3	0.73	**3rd**
8	Exposure to larger quantity of blood from patient	2.93	1.24	0.73	**3rd**
9	Insertion of intravenous catheters	2.47	1.06	0.62	**7th**
10	Deep injury or needle stick injury	2.90	1.28	0.73	**3rd**
11	Contact with device previously placed in a source patient's vein or artery	2.83	1.35	0.71	**4th**
12	Minor surgery	2.57	1.31	0.64	**6th**
13	Major surgery	2.70	1.40	0.68	**5th**

Based on the calculations in Table 4.3, items measuring percutaneous exposure had very high score on the responses of the health care workers of the selected hospitals. The mean values of the items were all high ranging from approximately risk to very risky. Again relative importance indices (RII) of all the items were above 0.5, indicating that they were risky factors. At least each of the factors can lead to HIV infection. According to the findings, the riskiest factor was the visible blood on an instrument like needle and sharp device which yielded 80% RII. The least among the risk factors was the 'insertion of intravenous catheters' which yielded 62% RII; even the value is quite high. Collection of blood with

hollow bore needles yielded the second highest risk factors with 76%. This is consistent with many of the submissions in the literature that percutaneous injury result from sharp devices and needle (Gerberding, 2003; Tokars *et al*, 1993; Henderson, 1995).

Mucotaneous transmission

Table 4.4. Mucocutaneous exposures and their ratings (Source: Field survey, 2014)

SR No.	Item/Question	Mean	Standard Deviation	RII	Rating
1	Unbroken healthy skin is likely to contract HIV	2.20	1.17	0.55	5th
2	Terminal illness in source patient	2.30	1.13	0.58	4th
3	Splash of blood onto the mucosal surface (like mouth, nose and eyes)	2.90	1.17	0.73	1st
4	Splash of visible bloody fluid in the mouth, nose or eye	2.80	1.14	0.70	2nd
5	Splash of potentially infectious material to the mouth, nose or eye	2.73	1.0	0.68	3rd
6	A bite from HIV-infected patient with visible bleeding in the mouth that causes bleeding in the health care worker	2.70	1.30	0.68	3rd

From Table 4.4, the mean value and RII rated blood splash onto open areas like mouth, nose and eye as very risky to HIV infection, confirming the claims made by Royal College of Nursing (1997) that accidental splash of blood onto mucosal surfaces can lead to HIV infection. The least ranked item of mucocutaneous factors was the unlikely that unbroken skin contracting HIV AIDS with RII of 55% and mean value of 2.20.

By examining the values and ratings of percutaneous and mucocutaneous factors on Tables 4.3 and 4.4, it was clear that health care workers were at risk of contracting HIV infection. Responses were all high, indicating that health care workers who encounter both percutaneous and muocutaneous exposure were at risk of contracting HIV AIDS. Meaning, health care workers need not to take chances at all when carrying out various medical activities. Care must be taken at all times from being exposed to blood and body fluids.

In order to establish which of the exposures was riskier, the factors were aggregated and their mean value and RII were determined. Percutaneous factors yielded mean value and RII of 2.8 and 0.7 respectively while mucocutaneous factors yielded mean value and RII of 2.61 and 0.65 respectively as displayed in figure 4.2. Based on the values of the two factors, percutaneous exposure was seen to be riskier than mucocutaneous exposure. Findings therefore indicate that health care workers were at risk of HIV infection at the workplace if care is not taken. Specifically, health care workers stand 70% chance of contracting HIV disease through percutaneous exposure and 65% chance through mucocutaneous exposure. Since relative importance index of both risk factors yielded RII more than 50%, it implies that both exposures are very risky and are likely cause HIV infection in the hospitals.

Conclusion

Recommendations are provided to address areas likely to result in exposure to risk in the hospitals to prevent them from occurring. Healthcare workers are exposed to body fluids in an attempt to discharge their various duties in the hospitals and therefore set them at risk of contracting HIV AIDS. These risk factors are grouped by this study as systematic and modifiable factors. The study assessed how these factors contribute to HIV AIDS infection in the three peri-urban the hospitals in Kumasi.

Knowledge about HIV AIDS transmission

All the participants were aware that HIV AIDS was a viral disease and for that matter is caused by a virus. The virus according to 96.7% of the participants, resides in blood and body fluid. Only 3.3% did not know that the virus lives in the blood and body fluid. Amazingly, 36.7% of the participants believed that the HIV AIDS disease can spread through casual situations like hugging, saliva, cough, sneezing, urine and faeces while 63.3% of the participants did not agree that AIDS is spread through such situations. All the participants admitted that the disease cannot be spread by insect bite but rather blood transfusion. While 96.7% accept that the disease is incurable, 3.3% think it is curable when one is infected with the disease.

Risk factors of HIV AIDS transmission

The individual items measuring percutaneous exposure and ranking it using relative importance index were assessed. In order of contribution of the items by ranking, findings established that visible blood is the major factor, followed by blood collection with hollow bore needles as second highest, intravenous or intramuscular injection of contaminated blood became the third ranked factor. The contributing factors were exposure to superficial or solid injury, followed by procedure involving placing needle in a vein or artery of a patient

Standard operating procedures (SOPs) use in the hospitals

The extent to which standard operating procedures were adhered to by healthcare workers was measured. These procedures were grouped into five main practices

By ranking, provision of safety devices and materials was the highest ranked item. In fact, the interview demonstrated that hospitals do not down play on safety issues, because of high risks of infection associated with health delivery.

Table 4.5. Ranking of standard operating procedures by respondents (Source: Field survey, 2014)

Health Practices / SOPs	Mean Value	Ranking	RII	Ranking
Provision of safety devices and materials	3.11	2nd	0.78	1st
Usage of safety devices and materials	3.07	3rd	0.77	2nd
Proper disposal of used devices and materials	3.07	3rd	0.77	2nd
Personal precautionary measures	2.99	4th	0.75	3rd
Hospital precautionary measure	3.23	1st	0.75	3rd

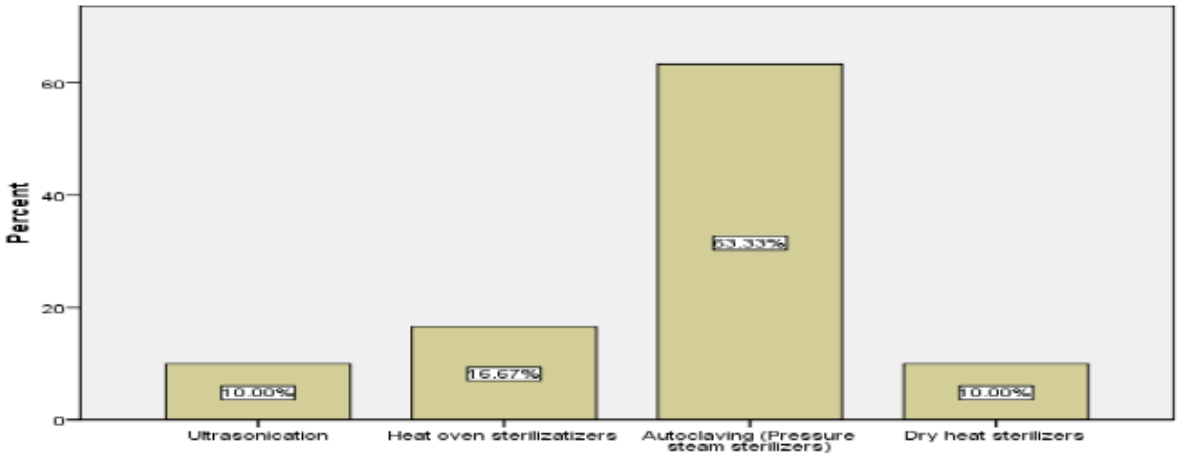

Figure 4.5. Methods of sterilizing reusable devices in the hospitals (Source: Field survey, 2014)

Behavioural factors causing HIV infection

Apart from the hospitals quest to curb workplace infection of any kind, individual workers behaviour on the job can greatly pose threat of infecting with disease at workplace. Findings revealed that non-use of protective materials when discharging or attending to patients was high in the hospitals. It was the item which exposes most of the workers to risk with the highest score. With the exception of this item, the rest of the items measured had low scores though, getting infected by a disease has nothing to do with less or huge misbehavior. HIV AIDS infection can be predicted at even infinitesimal misbehaviour.

Post exposure regimen

According to the findings, the regimen was generally inadequate. The hospitals have stated guidelines for treating personnel exposed to blood and body fluid and this is strictly adhered. As part of the medication, the affected personnel undergo two-drug regimen within four weeks of exposure to blood and body fluid and three-drug regimen after exposure to highly infectious blood or body fluid. Findings from the participants however indicated that the regimen after exposure was not rigorous and adequate.

Relationship between systematic and modifiable factors

The study tried to establish the relationship between the practices and the chance of acquiring HIV AIDS. The item measurements were aggregated and Pearson correlation was performed. Based on the findings, some of the practices were inversely related to the risk factors. This implies that as the practices increase at workplace or in the hospitals, the chance of risk to HIV infection by the healthcare workers is reduced. Other items were directly related to the risk factors, indicating that the more such practices or situations occur in the hospitals, healthcare personnel have high change of getting infected with HIV disease. Knowledge as one of the independent variables had negative coefficient of correlation, meaning increase in knowledge on HIV AIDS, decreases the chances of the personnel from contracting the disease.

Tables and figures

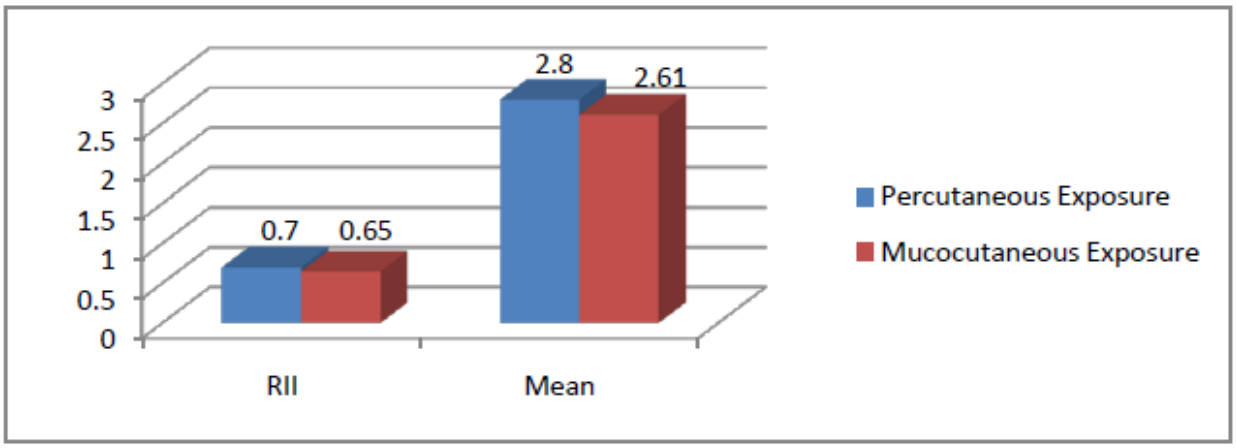

Figure 4.2. Aggregate computation of percutaneous and mucocutaneous factors (Source: Field survey, 2014)

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