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### Prevalence of fear of Perceived Risks of acquiring HIV Infections among Health Care Providers towards People Living with HIV and AIDS in River Nile State

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#### ABSTRACT

**Background:** Medical care providers must encounter with People Living with HIV Aids and be prone to acquiring HIV infection as a result of the nature of their work. As such, their knowledge and awareness of their likelihood of contracting the disease may interfere with their care for patient suffering from HIV/AIDS.

**Aim of the study:** The study aimed to find out the frequency of fear of perceived risk of infection among health care providers from those that are infected with HIV or their relatives at Nile River State of Sudan.

**Methods:** The study design is cross-sectional, descriptive, and correlational. A questionnaire was administered to medical care providers in in two hospitals in Nile State, Sudan. Questions that covers demographic characteristics, familiarity with HIV, fear, and perceived risk of Medical Care Providers were asked.

**Results:** Three hundred and ninety MCPs took part in the study, 136 were doctors, 219 were nurses, and 35 were midwives. Knowledge of the respondents is poor (1.8%), satisfactory (68.2%) and good (30%). The overall perceived risk in the majority of Medical Care Providers 66.7% was unclear, 27.9% had low perceived risk, while only 5.4% had high-perceived risk. Respondents' knowledge and level of perceived risk are significant statistically. The better the respondents' knowledge, the lower the perceived risk manifested. Appropriate recommendations were made.

**Conclusion:** Medical Care Providers have overall unclear perceived risk, with some amount of high perceived risk related to providing care or casual contact with PLWHA.

#### 1. Introduction

Knowledge and attitudes of healthcare providers regarding HIV infection are vital factors prompting the readiness and capability of people with HIV to access care, as well as the quality of the care given to them<sup>1</sup>. How MCPs perceive their own risks while caring for PLWHA potentially influences their readiness to provide care. This has implications on management as well as infection control as it may influence adherence to universal infection prevention procedures. These universal safeguards need to be employed by MCPs when caring for all patients whether infected or not infected. The absence of universal observance to infection control protocols expose MCPs to occupational HIV infection risk at virtually every level of their daily work<sup>2</sup>. These involve using devices which are generally termed Personal Protective Equipment (PPE) like gloves, masks and other equipment that protects MCPs from sources of infection. The safeguards should also be used while in contact with all body discharges<sup>3</sup>. All medical care providers will need to encounter PLWHA and this exposes them to the danger of acquiring HIV infection at their workplace<sup>4</sup>. However, their knowledge and awareness of likelihood of contracting infection may affect the care given to patient or attitude to the infectious diseases<sup>5</sup>. An earlier study<sup>3</sup> documented increased compliance with universal infection precautions among health care professional due to fair and perceived risk of infection being known while dealing with patients infected with HIV<sup>6</sup>.

Even although it is known, for instance, the chances of getting a needle stick injury contaminated with HIV is as low as 1 in 250 cases<sup>7</sup>, MCPs are still worried and avoid direct contacts with PLWHA<sup>8</sup>. It is surprising that with the knowledge of how HIV can be acquired, MCPs still behave like the general population, fearing the direct interaction that caring for PLWHA will need<sup>9</sup>. A previous study reported

undesirable attitudes towards patients with HIV infection compared with those infected with hepatitis B, due to perceived risk of contracting infections from such patients leading to reduced willingness of health profession to interact with them.<sup>10</sup>

There may be an increased risk of infection to MCPs attending to patients suffering from HIV when rules of universal precaution are violated or if appropriate protective devices are not used. Their awareness of the risk they are exposed to may interfere with the care rendering to the patients<sup>11</sup>. Studies have found an important link between stigma and discrimination and patients' willingness to access treatment<sup>12,13</sup>. Identifying the problems of health care staff who work with HIV infected patients and providing appropriate solutions will enable them to work effectively without unnecessary fear. Therefore, our study aimed at providing better understanding of the potential fears of MCPs while managing HIV patients. The importance of such an investigation is for results to lead to improved infection control protocols and appropriate policy that will enhance quality care for PLWHA.

#### 2. Materials and Methods

This study is descriptive and cross sectional in design and was conducted in three hospitals in North Sudan River Nile State. The study population consisted of doctors, nurses, and midwives on duty on the days the research took place from all departments.

**Sampling Technique:** All Medical care providers according to the WHO definition (doctors, nurses, and midwives) present on duty on the day of survey who are willing to participate were included. For the purpose of the study, inclusion Criteria are non-private hospitals in River Nile State; Health care staff who met the definition the WHO healthcare personnel criteria (doctors, nurses and midwives); MCPs who were present at work during visiting days; and MCPs who have direct contacts with patients' blood and body fluids and/or providing

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medical care to adult and children. Total number of participants in the study were three hundred and ninety MCPs.

The objectives were to measure MCPs knowledge of HIV/AIDS and perceived infection risk while providing services to PLWHAs; to assess the accessibility of personal protective devices while caring for patients; and to assess the relationships between MCPs familiarity, perceived risks, while providing care to PLWHAs. Data collections were through questionnaire that was pilot tested and developed in English but translated to local language to enhance understanding.

The questionnaire consists of four parts - personal characteristics; knowledge of HIV/AIDS; perceived risk; and accessibility to equipment for personal protection (PPD). Participants awareness of HIV/AIDS was tested by the use of 12 questions testing 24 different issues related to the infection ranging from mode of transmission presenting symptoms, prevention strategies and risk assessment. Perceived risk of acquiring HIV infection was assessed by using 20 statements. Participants were requested to use the five-point scale (1 = no risk, 2 = low risk, 3 =don't know, 4= moderate risk, 5= high risk) to assign degree of risk regarding each of 20 statements. Total perceived risk therefore scores corresponded scores from entire 20 statements to make points obtainable not exceeding 100 points. Perceived risk scores were calculated using scales 1-5. There are two categories of variables that pose no risk and those that posed risks. If risk is assigned to category 1 it is considered an overestimation while failure to assign risk to category 2 was considered an underestimation of risk. There were 10 questions in each category. The scores which were reversed in weight for example score 5 was calculated to be 1 meaning lower risk and 1 was assigned 5. The idea is that the higher the scores the lower the risk and vice versa. Descriptive statistics such as mean, median and standard deviations were then calculated. Total perceived risk scores were also categorized into 3 groups according to the responses of participants and the final scores of the 20 statements. Low perceived risk (scores 60-100), unclear perceived risk (scores 41-60) and high perceived risk (scores ≤40).

Data analysis done by SPSS 15.0 version with descriptive analysis followed by One-way-ANOVA and correlation analysis. P-value of 0.05 was set as significant statistically

**Ethics Consideration**

Ethical approval was obtained from both the Ministry of Health and the Faculty of Medicine. Participants signed the informed consent form and participations were purely voluntary.

**3. Results**

Results of Knowledge and Training of participants on HIV are presented in figures 1 and 2 respectively. Overall, knowledge was categorized as good, satisfactory, and poor. 7 participants (1.8%) were classified to have poor knowledge (scores ≤ 50%), followed by 266 participants (68.2%) who were classified as having satisfactory knowledge (scores more than 50% and less than 75%) and 117 participants (30%) classified having good knowledge (scores ≥ 75%).

The majority of participants (82.8%) reported that they did not receive training on HIV with only a few (17.2%) reporting having training. Those who received training reported the following training sources: the university (11.3 %), in their hospital (4.9%) and in an AIDS program (1%).

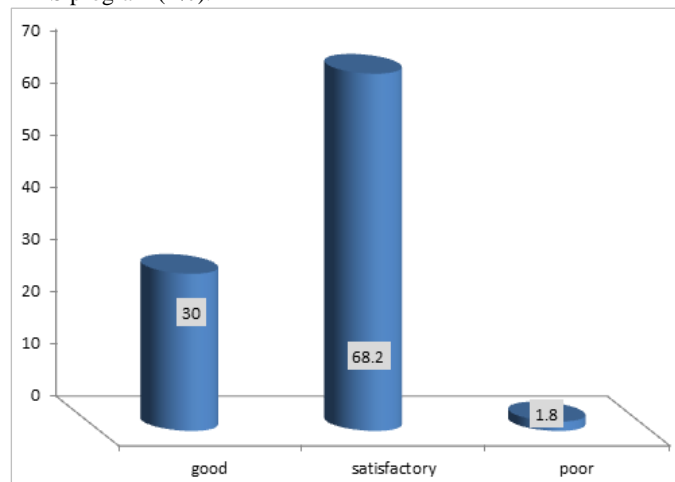


Figure 1: Overall HIV knowledge

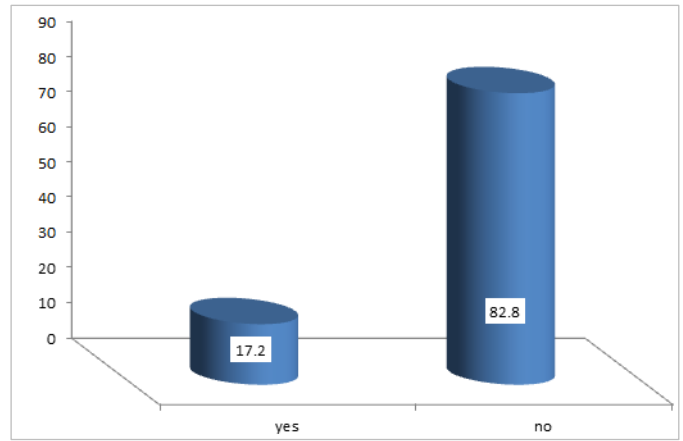


Figure 2: Training on HIV

**Fear and perceived risk:** Perceived risk was categorized into three groups according to the responses of participants and the final scores of respondents from the 20 statements. The low perceived risk group consisted of 109 of participants (27.9%) who assigned no risk or low risk to the statements and had more than 60.0 of the total scores). A second group who were unclear of perceived risk consisted of 260 of participants (66.7%) who assigned not sure to the statements and had scores of more than 40 and equal or less than 60 of the total scores). The third group was the high perceived risk group of 21 of participants (5.4%) who assigned moderate to high risk to the statements and had ≤ 40% of the total scores) as shown figure 3.

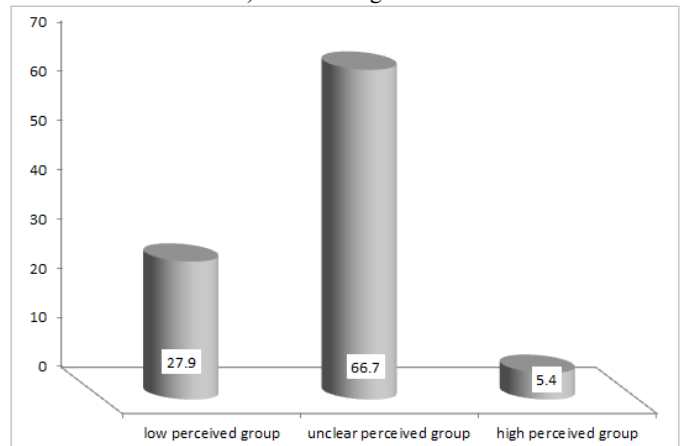


Figure 3: Fear and perceived risk

Table 1 presents the participants' responses according to their overestimation of HIV risk to situations where there are no risks. The answers show that 89% of the participants considered the use of one pair of gloves as risk especially when caring for HIV patient, 62.4% said caring for HIV patients on daily basis is a risk, and 59.8% considered biting by person suffering from HIV a risk. On the other hand, table 2 displays the participants' responses according to their underestimation of HIV risk to situations where there are risks. A little more than half (50.5%) underestimated the risk involved when used needles are covered back after withdrawing blood from a patient whose HIV status is not known, while nearly half of participants (49.7%) underestimated risk in administering injections to an HIV-positive patient.

Table 1: Over estimating HIV risk to situations without risk

Situation with no risk	No.	%
Using only one pair of gloves during invasive procedures with HIV patient	347	89.0
Taking care of many HIV-positive patients every day	243	62.4
Being bitten by a person with AIDS	233	59.8
Shaking hands with AIDS patient with generalized body skin rash	158	40.5
Providing care to patient with unknown HIV status	138	35.4
Working with HIV person everyday	126	32.3
Providing care to dying AIDS patients	198	50.8
Sharing a drinking glass with someone how is HIV positive	84	21.5
Being sneezed on by a person with AIDS	125	32.1
Touching an HIV positive patient when assessing him/her	126	32.4

**Table 2:** Under estimating risk to situations with low to high risk

Situation with risk	No.	%
Administering vaccines to an infant born to HIV positive woman	159	40.8
Delivering babies of women who are HIV positive	147	37.7
Administering injections to an HIV-positive patient	194	49.7
Performing vaginal test for HIV positive woman	103	26.4
Recapping needles after withdrawing blood from a patient of unknown HIV status	197	50.5
Cleaning and dressing a wound of an HIV positive patient	104	26.7
Insertion or removal of intravenous cannula on an HIV patient	91	23.3
Performing surgery on a patient of unknown HIV status	43	11.0
pricking yourself with a needle used on a patient with AIDS	22	5.6
Having sexual intercourse with HIV/AIDS person using a condom	139	35.6

Table 3 displays Perceived risk mean score results by personal characteristics of participants. The p-value was significant between the perceived risk and working department, the higher perceived risk was in the obstetrics. Also, there relationship between perceived risk and knowledge whereas there was none observed regarding gender, age, occupation, qualification, and hospital and the p-value were not significant.

**Table 3:** Perceived risk mean score results by personal characteristics

Providers characteristics	N	Mean	SD.	P value	
sex of participant					
Male	117	20.2650	8.36082	0.60	
Female	273	19.7546	9.88622		
age groups					
20-30	180	20.4500	9.29304	0.50	
31-40	155	19.4323	9.73748		
41-50	40	18.9000	6.51153		
51-60	15	21.0000	14.27785		
Occupation:					
Doctor	136	21.4779	8.27577	0.20	
Nurse	219	17.3516	8.56543		
Midwife	35	29.8000	11.22445		
Qualifications					
Bachelor	233	21.2876	8.09314	0.05	
diploma after secondary school	68	16.2941	9.23016		
diploma after primary school	38	18.0526	6.84558		
secondary school	51	19.8039	14.56986		
Hospital					
Atbara hospital	236	20.3093	9.70116	0.20	
Edamer hospital	106	19.8019	9.32934		
Berber hospital	48	18.1667	8.34708		
Department					
emergency department	96	17.6042	9.66326	<0.01	
internal medicine	90	16.0333	7.58095		
Paediatrics	61	21.0164	9.46835		
Surgery	64	21.2656	6.28488		
obstetric department	73	26.0548	10.23867		
ENT	4	11.7500	4.27200		
Ophthalmology	2	19.5000	13.43503		
Providing HIV care experience					
Yes	300	20.3100	9.92213		0.10
No	90	18.5667	7.54619		
Training on HIV					
Yes	67	27.8657	8.54027	<0.01	
No	323	18.2570	8.77207		
knowledge groups					
Good knowledge	115	18.6609	7.43733	<0.01	
Satisfactory knowledge	268	20.6567	10.09958		
Poor knowledge	7	11.7143	7.91021		

Table 4 presents correlations between discriminatory practices, knowledge, and perceived risk. the better the participants' knowledge the lower the perceived risk and discrimination.

**Table 4:** Correlation between Discriminatory Practices, Knowledge and Perceived Risk

Variables	Total discriminatory scores	
	Correlation ( r )	p. value
Percentage of total knowledge scores	-0.072	0.20
Total perceived risk scores	-0.313	<0.01

#### 4. Discussion

No study has been carried out looking at the perceived risk and knowledge of people caring for HIV infected patients in the study area although there has been study that examined sigma and discrimination among health care staff<sup>14</sup>. Here we report knowledge, perceived risk.

Only 17.2% of the Health care staff that had HIV training while the rest did not. This is likely to make those who did not receive training have increased perceived fear as found in Tanzania<sup>15</sup> in which 37% had satisfactory knowledge while 26% had good knowledge. This result agreed with Raja'a and colleagues in Yemen using 211 in the child development project who found half (50%) participants having satisfactory knowledge about HIV/AIDS<sup>16</sup> and in contrast with study done in Tanzania<sup>17</sup> among 204 HCPs which showed fair level of knowledge where 37% had satisfactory knowledge while 26% were good knowledge. The 83.2% good knowledge were mainly in knowledge regarding 'mode of transmission' (93.1%) and this contradicts with a study in Sudan conducted by Health Alliance among 461 health care workers (doctors and nurses) that revealed poor knowledge on HIV transmission where only 25 % to 33 % of respondents correctly identified risk of infectivity from different bodily fluids<sup>18</sup>. The results are consistent with many other earlier studies. For example a study from Saudi Arabia conducted among 361 physicians revealed several gaps in their knowledge regarding mode of HIV/AIDS transmission particularly on mode of transmission 33.8% of physicians failed to identify tattooing as a mode of transmission where 49.7 % and 13.8% considered kissing and mosquito bites respectively as a possible mode of transmission<sup>19</sup>. Also, similar results were found in Egypt in a study conducted by Sallam and colleagues on two groups of Egyptian physicians (330 in Alexandria and 144 in Asir Region Saudi Arabia). The study showed lack of knowledge in the mode of transmission where 33.3% to 34.7% failed to identify tattooing as a mode of transmission 41.7% - 42.1% considered kissing as mode of transmission and 20.0% - 20.5% considered mosquito bites as a possible mode of transmission<sup>20</sup>. In Nigeria, the picture is different where a study found 77.1% classified correctly breastfeeding as a source of HIV transmission with 5.2% and 2.6% respectively assumed transmission was possible through mosquito bite and handshake<sup>21</sup>.

The overall perceived risk was found in the majority of MCPs (66.7%) with only 5.4% had high perceived risk while 27.9% had low perceived risk. This is in contrast with studies done in Tanzania<sup>17, 14</sup> India<sup>22, 19</sup> and Ethiopia<sup>23</sup> which showed high perceived risks respectively. In India, high perceived risk among 91% of 266 HCWs who perceived HCWs as being at high risk of occupational infection and 63% perceived themselves at high risk of occupational infection from HIV<sup>22</sup>. A study in Ethiopia among 170 HCWs, revealed high perceived risk of HIV infection: 81% agreed that their job placed them at risk of HIV infection and 30% suggested casual transmission<sup>23</sup> while 89% of MCPs believed that using only one pair of gloves during invasive procedures with HIV patient put them at high risk, 62.4% stated that taking care of many HIV-positive patients every day put them at high risk.

In this study 59.8% stated that being bitten by a person with AIDS is a risk factor of transmission, 40.5% shaking hands with AIDS patient with generalized body rash, 21.5% sharing a drinking glass with HIV patients and 32.1% being sneezed on by a person with AIDS. The underestimation of HIV risk of infection transmission that may be attached to recapping needles after withdrawing blood from a patient of unknown HIV status may be due to lack of training and workshops. The overall level of fear was low 36.2%, 25.1% of getting HIV from their patients, and 19.5% stated that people stigmatize who take care of HIV patients, and recommendation of isolation was unclear 62.6%. These findings are consistent with a study conducted in Tanzania<sup>23</sup> which showed 72% of health care providers assigned risk of HIV infection transmission to at least one of five examples of casual contact with HIV/AIDS patients. 54% assigned risk to shaking hands with AIDS patients with a generalized body skin rash; 26% assigned risk to being sneezed on by an AIDS patient and 34% assigned risk to sharing a glass with an HIV-positive person.

#### 5. Conclusion

Medical care providers have overall satisfactory knowledge about HIV with some amount of poor knowledge related to presenting symptoms, virology, and prevention strategies. The higher knowledge was attained by doctors, while the lower knowledge was attained by midwives and nurses. MCPs have overall unclear perceived risk, with some amount of high perceived risk related to providing care or casual contact with PLWHA. The lower perceived risk was recorded by doctors, while the higher perceived risk was recorded by nurses. There

was an association between knowledge and perceived risk, the higher the knowledge, the lower the perceived risk.

## 6. Recommendations

Strong and comprehensive educational program should be designed to convert unclear perceived risk to low perceived risk and highlight the better ways that protect MCPs when providing care to patients with HIV.

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