

# HIV/AIDS knowledge among Iranian Health Care Workers

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## Keywords

Sexually transmitted • Public Health • Health Care Workers

## Summary

**Background.** HIV/AIDS remains a major public health concern globally and Health Care Workers (HCWs) are in the frontline of preventing and providing care in the health care system. The aim of this study was to evaluate HIV/AIDS knowledge among Iranian HCWs.

**Methodology.** This cross-sectional study was conducted among 200 HCWs who were randomly selected from health care centers in Kermanshah city, west of Iran, 2018. HCWs filled out a self-administered questionnaire including the socio-demographic characteristics and HIV/AIDS knowledge items. Data were ana-

lyzed by SPSS version 16 using bivariate correlations, t-test, and ANOVA statistical tests.

**Results.** The mean score of HIV/AIDS knowledge was 29.73 [95% CI: 28.79, 30.67], ranged from 0 to 40 (74.3% of total percent). There was no significant association and correlation between HIV/AIDS knowledge and sex, education level, marital status, age and job history. Up to 50% had inadequate knowledge about HIV/AIDS status and transmission in Iran.

**Conclusions.** HCWs HIV/AIDS knowledge was average and it seems need to be educating regarding HIV/AIDS status and transmission in Iran.

## Introduction

HIV/AIDS remains a problem in many countries, especially in less developed countries [1]. According to the Global HIV & AIDS statistics, 37.9 million [32.7 million-44.0 million] million people live with HIV/AIDS worldwide [2]. Although, prevalence of HIV/AIDS in the Eastern Mediterranean Region (EMR) countries like Iran is lower than the western countries, but HIV/AIDS infection is becoming more prevalent in developing countries gradually, due to unprotected sexual intercourse and drug abuse behaviors [3]. In 2015, the rate of HIV/AIDS prevalence in Iran was 11.4 per 100,000 populations, a 10.5% increase from 1990 [4]. Of course, the real prevalence can be higher, due to the social, cultural, taboo and religious factors in the Middle East, reporting is underestimate [5]. Although people of all ages in both genders are susceptible to HIV/AIDS infection; nonetheless, gender roles and relations are increasingly known as one of the essential factors driving the rapid spread of HIV infection [6]. As well as, globally, differences in the number of new HIV infections between men and women are more pronounced at younger ages and statistics indicated that the new infections among young women (aged 15-24 years) were higher than they were among men in the same age group [7]. Moreover, according to the World Health Organization (WHO) and

the Joint United Nations Program on HIV/AIDS, younger people are more at risk of HIV [8]. The significant contributors for the spread of HIV/AIDS would be drug abuse (i.e. Injection Drug Users (IDUs) and needle and syringes sharing), unprotected and high-risk sexual activity (i.e. sex workers), inadequate health literacy (i.e. less HIV/AIDS knowledge), discriminatory attitude (i.e. HIV-positive patients may be rejected in a relationship) and anti-social behavior against infected people (i.e. HIV-positive patients may be separated from the society), and likewise HIV/AIDS is a rare social and also familial discussion [9].

A culture of silence surrounds HIV/AIDS and related issues, especially in developing countries like Iran, where people are still living in a conservative society, cannot help the health care system to reduce HIV/AIDS prevalence [10]. In the worst situation, HIV-related issues are still shadowed by cultural and social restrictions, discrimination, discounting, discrediting, denial, stigma, and prejudice directed at people living with HIV/AIDS; especially sex workers and IDUs, which leads to many HIV/AIDS prevention interventions are broken, and consequently the epidemic continues to spread [11]. For example, a study conducted in the United State (US) in 2016, illustrated most HIV-positive patients experienced stigma in their daily lives, as well as from their health-care workers [12]. While based on the World Bank state-

ment “waiting to intervene may be costly”, indicates the need to take action immediately [13].

The knowledge of HCWs regarding HIV/AIDS infection is a major factor influencing their willingness to provide care for HIV-positive patients and also the willingness of people living with HIV to access care, and the quality of the care they receive [14]. Despite HIV-related medical education and experience in the last decades, some health care providers still have shown a reluctance to take care of HIV-positive patients, in particular in developing countries [15]. In addition, HCWs may be exposed to the risks associated with blood-borne viruses like HIV/AIDS via contact with blood (and other body fluids) during their work for example needle sticks; evidence shows that annually about 3 million percutaneous exposures with blood borne pathogens happen among 35 million HCWs across the world, leads to 200 to 5000 HIV/AIDS infections [16]. On the other hand, several studies noted that the use of determinants such as knowledge in planning health promotion programs could be useful in order to the promotion of healthy behavior [17]. HCWs are the milestone of medical care and also play a basic role in health areas and globalization health. Lack of knowledge may contribute to HCWs’ attitudes and concerns about providing care and also may lead to occupational HIV/AIDS transmission. In addition, according to the Kermanshah University of Medical Sciences and Health Services, 3551 (11.76%) HIV/AIDS patients are identified in the Kermanshah province from 30183 HIV/AIDS patients in Iran [18].

With this background, HCWs are at serious risk of HIV/AIDS infection. Consequently, HIV may be transmitted from HCWs to the community if he/she does not have adequate HIV/AIDS Knowledge. Therefore, it is crucial to assess the knowledge of HCWs regarding HIV/AIDS infection if prevention is to be addressed appropriately. The aims of the study were to evaluation HIV/AIDS knowledge among HCWs in western Iran.

## Methodology

### PARTICIPANTS AND SAMPLING

This cross-sectional study was conducted among HCWs in Kermanshah, the west of Iran, during 2018, with the aim of providing knowledge for the planning health promotion program to increasing knowledge HCWs in west of Iran towards HIV/AIDS. The sample size was calculated at 95% significant level according to the results of a pilot study among 30 HCWs which that reported the standard deviation (SD) of HIV/AIDS knowledge among HCWs was 7.05 a sample of 200 was estimated. Of the population of 200, 191 (95.5%) signed the consent form and voluntarily agreed to participate in the study, that has been approved by institutional review board at the Kermanshah University of medical sciences. This research has been approved by the research ethics committees at the Kermanshah University of medical sciences, the west of Iran (IR.KUMS.REC.1398.469).

To select the participants and collect data the following stages were done. First, areas of the city were classified based on the division of the geographical region, next for each social class two health care centers were randomly selected (a total of sixteen health centers were selected). Then, among the primary health care workers on the health care centers, were enrolled into this study voluntarily. Finally, the volunteers were given the self-administration questionnaire, after we explained the main objective of the study.

### TOOL AND DATA COLLECTION

Prior to conducting the main study, a pilot study was conducted to evaluate the validity and reliability of the instrument. The pilot study was conducted among 30 subjects, similar to those who participated in the main study. Questionnaire included two sections that comprised of 45 question and items: 5 questions for demographic factors, and 40 items for HIV-AIDS knowledge.

#### A: Demographics questionnaire

The background variables assessed in this study included: age (year), job history (year), sex (male, female), marital status (single, married), and educational level (technician, BSc, MSc and MD).

#### B: HIV-AIDS knowledge questionnaire

HIV-AIDS knowledge was evaluated by 40 questions standard scale in Persian [14]. Each question was measured on a multiple-choice question. Score ranged was 0 to 40. Example of the question is: “HIV/AIDS not transmitted by social relationships, so there isn’t needed in isolation of HIV-positive patients from others”. The reliability coefficient of HIV-AIDS knowledge questionnaire in our study was 0.84.

To collect data, we contacted the administrative staff in each health centers to find available times that we could complete the questionnaires among selected HCWs. Data collection was done in a face-to-face interview style, which took about 10-12 min to complete. Then, the eligible HCWs signed consent forms, were interviewed separately by two trained interviewers after we explained the main objective of the study.

### DATA ANALYSIS

The Statistical Package for the Social Sciences (SPSS) (ver. 16.0) was used for the purpose of data entry, manipulation, and analysis. Quantitative variables were expressed as means with CI, SDs, and qualitative/categorical ones as frequencies and percentages. Bivariate correlations were computed to ascertain the magnitude and direction of the associations between the knowledge with the age and job history. One-way ANOVA and t-test was performed to explain the association of sex, education level and marital status with HIV-related knowledge. In addition, split-half was used to estimate the internal consistency of the various measures in our study.

## Results

The mean age of respondents was 37.04 years [95% CI: 36.11, 37.97], ranged from 22 to 54 years. The mean years of job history of respondents was 12.30 years [95% CI: 11.36, 13.25], ranged from 1 to 27 years. More details of demographic characteristics of the participants are shown in Table I.

The mean score of HIV-AIDS knowledge of respondents was 29.73 [95% CI: 28.79, 30.67], ranged from 0 to 40. Based on this finding, respondents were received 74.3% of total score of HIV-AIDS knowledge questioner.

As indicated in Table II HIV-AIDS knowledge was not significant association with sex, education level and marital status.

Our findings indicated knowledge was not significant correlation with the age ( $r = 0.082$ ) and job history ( $r = 0.088$ ).

Table III has been showed the correct and incorrect answer of HIV-AIDS knowledge items among participants.

## Discussion

Our results showed that the total HIV/AIDS knowledge in our study was at a relatively moderate level (74.3%); showing gaps relating to HIV/AIDS infections exposures, HIV/AIDS risk prevention, and occupational HIV/AIDS transmission; and expressed the need for more education. The moderate level of HIV/AIDS knowledge in this study might be due to most HCWs were aged (30-49 years), and so may not have received a curriculum with update HIV/AIDS knowledge or may not have participated in HIV/AIDS in-service programs.

Our results concur with the results of some studies conducted in Iran and other countries. For instance, an international study conducted with the nurses in Finland, Estonia and Lithuania reported that the whole respon-

Tab. II. Association of sex, education level and marital status with HIV-related knowledge.

Sig	Mean (SD)		Variables
0.272	28.73 (7.69)	Male	Sex
	30.07 (6.14)	Female	
0.850	30.22 (5.93)	Technician	Education level
	29.57 (6.77)	BSc	
	29.64 (6.99)	MSs or MD	
0.341	28.95 (7.16)	Single	Marital status
	30.00 (6.37)	Married	

dents showed moderate levels of HIV/AIDS knowledge in 2010 [19]. Also, Mulaudzi and colleagues from South Africa have reported 83.8% nurses had average level of HIV knowledge in 2011 [20]. Likewise, Delobelle and colleagues from South Africa have reported HIV/AIDS knowledge of nurses was moderate in 2009 [21]. Similarly, Saydkhani et al work conducted in Ahvaz, another state of Iran, showed 60% anesthesia staff had moderate knowledge regarding HIV/AIDS infection in 2010 [22]. However, many other researchers reported converse results. For example, research conducted by Kumar et al among paramedical staff working in private healthcare facilities in Delhi, showed that majority had poor knowledge regarding HIV/AIDS transmission in 2017 [23]. A study conducted in KwaZulu-Natal, South Africa also revealed that the health care providers had limited knowledge toward the reproductive needs and rights of individuals living with HIV in 2017 [24]. Similarly, Kawale et al, from Malawi have reported most health care providers had very poor knowledge about HIV and reproductive health, as well as prevention of mother-to-child transmission in 2015 [25].

Conversely, Desai and colleagues showed 80% health care providers were knowledgeable in term of pre-exposure prophylaxis for HIV infection in United Kingdom in 2016 [26]. Likewise, the results of Hughes's survey conducted in 2011, showed the favorable knowledge of HIV/AIDS with scores of 89% and 84% for physicians and nurses, respectively [27]. A similar study conducted by Jafari et al. in Tehran, capital city of Iran, showed that 83.8% participants had good knowledge of HIV/AIDS and its transmission [28].

Moreover, we found no significant association between sex, education level, marital status, age and years of work experience with HIV/AIDS knowledge. A study by Delobelle et al. also indicated HIV/AIDS knowledge was not associated with age, gender and years of experience [21]. To best our knowledge, the higher level of education was directly related to more favorable knowledge, however, we found no relationship between education level and HIV/AIDS knowledge, need to be more addressed. In contrast, the results of study conducted by Jafari et al. observed a significant association between sex, age, education level and job history with HIV/AIDS knowledge [28]. Conversely, Oppong et al reported that HIV/AIDS knowledge were significantly associated with marital status [29].

Tab. I. Distribution of the demographic characteristics among the participants.

Percent	Number		Variables
13.1	25	20-29	Age group (year)
49.2	94	30-39	
35.6	68	40-49	
2.1	4	50-60	Job history
18.3	35	1-5	
25.7	49	6-10	
19.4	37	11-15	
29.3	56	16-20	Sex
7.3	14	21-30	
25.7	49	Male	
74.3	142	Female	Education level
23.6	45	Technician	
67.5	129	BSc	
8.9	17	MSs or MD	Marital status
25.7	49	Single	
74.3	142	Married	

Tab. III. Correct and incorrect answer of HIV/AIDS knowledge items among participants.

No	Items	Correct	Incorrect
1	The third wave of HIV/AIDS in Iran is caused by unprotected sexual behaviors.	2 (1%)	189 (99%)
2	In Iran, mother-to-child and sexual transmission have rapidly increased in recent years.	61 (31.9%)	130 (68.1%)
3	Nowadays, sexual transmission is the most common HIV/AIDS transmission in Iran.	63 (33%)	128 (67%)
4	Those with high-risk behaviors should refer to counseling centers for behavioral diseases.	85 (44.5%)	106 (55.5%)
5	Usually, mother-to-child HIV transmission occurs during the first and last month of pregnancy or during delivery or breastfeeding.	87 (45.5%)	104 (54.5%)
6	Repeating the HIV/AIDS test every 3-6 months is important for at-risk peoples.	88 (46.1%)	103 (53.9%)
7	Psychedelic drug use, especially methamphetamines increase the risk of sexual transmission of HIV/AIDS.	95 (49.7%)	96 (50.3%)
8	Multiple sexual partners, sexuality and the stage of HIV/AIDS in patients lead to the increased likelihood of transmission.	114 (59.7%)	77 (40.3%)
9	The window period is time between infections with HIV/AIDS until the HIV antigen detected by standard HIV tests.	127 (66.5%)	64 (33.5%)
10	HIV/AIDS transmission through blood and contaminated blood products has been controlled in Iran.	131 (68.6%)	60 (31.4%)
11	Formula milk feeding is an effective prevention strategy to reduce mother-to-child HIV/AIDS transmission during breastfeeding.	134 (70.2%)	57 (29.8%)
12	Mother-to-child transmission of HIV/AIDS occurs during pregnancy, delivery, and breastfeeding.	135 (70.7%)	56 (29.3%)
13	Negative HIV test results immediately after high-risk behavior, it's not actually confident for HIV/AIDS transmission.	143 (74.9%)	48 (25.1%)
14	IDUs are only vulnerable to HIV/AIDS infection.	144 (75.4%)	47 (24.6%)
15	To know about the HIV/AIDS status, counseling and getting a test for HIV/AIDS is recommended.	146 (76.4%)	45 (23.6%)
16	Protected and safe sex is the most important strategy for prevention of HIV/AIDS in Iran.	151 (79.1%)	40 (20.9%)
17	Educational programs for youth regarding HIV/AIDS transmission is an effective preventive strategy, especially in sexual transmission.	152 (79.6%)	39 (20.4%)
18	People with high-risk behaviors are in prioritizing for consultation and testing of HIV/AIDS.	152 (79.6%)	39 (20.4%)
19	Antiretroviral treatment for the mother, prenatal care for HIV-positive women and cesarean delivery may prevent mother-to-child transmission of HIV/AIDS.	156 (81.7%)	35 (18.3%)
20	HIV/AIDS infection is becoming more prevalent in Iran.	157 (82.2%)	34 (17.8%)
21	Sexually transmitted diseases increase the risk of HIV/AIDS infection transmission.	159 (83.2%)	32 (16.8%)
22	HIV/AIDS may not be transmitted from a shared bathroom and toilet.	161 (84.3%)	30 (15.7%)
23	In testing HIV/AIDS, the private space of information should be kept confidential.	161 (84.3%)	30 (15.7%)
24	HIV/AIDS infection is transmitted by mosquito bites and social relationships like talking, coughing, shaking hands and or kissing.	162 (84.8%)	29 (15.2%)
25	Reducing stress and anxiety, decisions on the need for repeat testing and appropriate psychological support from people who have positive test results are the purpose of the consultation before and after the test.	162 (84.8%)	29 (15.2%)
26	HIV/AIDS can be transmitted through needle and syringes sharing.	165 (86.4%)	26 (13.6%)
27	People with unprotected and high-risk sexual activity are more vulnerable to HIV/AIDS infection.	165 (86.4%)	26 (13.6%)
28	HIV/AIDS is not transmitted by social relationships, so there isn't needed the isolation of HIV-positive patients from others.	165 (86.4%)	26 (13.6%)
29	An HIV positive patient may be asymptomatic in the early stages.	166 (86.9%)	25 (13.1%)
30	HIV infection transmitted by blood, breast milk and sexual secretions.	167 (87.4%)	24 (12.6%)
31	HIV/AIDS not transmitted by touching the infected things e.g. money, dress and etc.	167 (87.4%)	24 (12.6%)
32	Drug abuse, infected with sexually transmitted diseases (STDs) and intercourse with men who have sex with men (MSM) increased the risk of HIV transmission.	167 (87.4%)	24 (12.6%)
33	Early diagnosis of HIV/AIDS leads to control of the disease, treatment and reduces the prevalence.	168 (88%)	23 (12%)
34	Lack of loyalty to the spouse and sexual immorality is the predisposing factor for HIV/AIDS transmission.	169 (88.5%)	22 (11.5%)
35	Sexual restraint, loyalty to the husband, sexual intercourse protected by a suspect sex partner is recommended to prevent sexual transmission of HIV/AIDS.	171 (89.5%)	20 (10.5%)
36	Pregnant women that themselves and their husbands' had a history of high-risk behaviors and also the history of prison should be recommended to HIV/AIDS tests.	174 (91.1%)	17 (8.9%)
37	HIV, which causes AIDS weakens and destroys the immune system	175 (91.6%)	16 (8.4%)
38	People with high-risk behaviors (i.e. unprotected sexual activity or needle sharing and syringes) should be recommended for getting a consultation and HIV/AIDS test.	175 (91.6%)	16 (8.4%)
39	Education is the best strategy to control HIV/AIDS.	177 (92.7%)	14 (7.3%)
40	Adolescence and youth are more vulnerable to HIV/AIDS infection.	180 (94.2%)	11 (5.8%)

Our participants had little knowledge regarding HIV/AIDS status in Iran, for example about; “The third wave of HIV/AIDS in Iran is caused by unprotected sexual behaviors” and “In Iran, mother-to-child and sexual transmission have rapidly increased in recent years” also “Nowadays, sexual transmission is the most common HIV/AIDS transmission in Iran. This finding clearly shows our study population did not access to update HIV/AIDS knowledge, in particular regarding HIV/AIDS status in Iran.

Less than 50% of the participants had the correct answer to the following questions; “Those with high-risk behaviors should refer to counseling centers for behavioral diseases”, “Usually, mother-to-child HIV transmission occurs during the first and last month of pregnancy or during delivery or breastfeeding”, “Repeating the HIV/AIDS test every 3-6 months is important for at-risk peoples” and “Psychedelic drug use, especially methamphetamines increase the risk of sexual transmission of HIV/AIDS”, such findings clearly observe that more effort needs to be done to improve HIV-related knowledge among HCWs in Western Iran. In this regard Mbanya carried out a study on 107 nursing staff in a rural hospital of Cameroon and indicated the 70.1% of the nurses who responded scored highly in the knowledge section [30]. Moreover, Ghorbani in their study among nurses of Baqiyatallah hospital in Tehran in the capital of Iran and reported about half of the nurses had moderate knowledge about HIV/AIDS [31]. These results indicated supplementary education toward HIV/AIDS is needed to strengthen the knowledge of HCWs.

The most important limitation of the current study, as a cross-sectional, was that we used self-reported data to examine the knowledge toward HIV/AIDS among HCWs; these types of data may have a lower accuracy rather than observational methods. Secondly, some further analysis directed to the associations did not apply due to the cross-sectional nature of the study design. Third, our study was conducted among HCWs in the west of Iran and the results of this study are not generalizable to the other place or population. Fourthly, some HCWs were unwilling to participating in the study.

## Conclusions

In our study, HIV/AIDS knowledge of HCWs was average, and several gaps and misconceptions were found regarding HIV/AIDS status and transmission in Iran. Given the global HIV/AIDS epidemic and increasing numbers of HIV/AIDS patients, HCWs should be educated regarding HIV/AIDS.

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## Conflict of interest statement

The authors declare no conflict of interest.

## Authors' contributions

Study design: MM-A and FJ. Data analysis: FJ and MM-A. Study supervision: MM-A. Manuscript writing and revisions: MM-A, FJ, MEM, AS, and MF. All authors provided comments and approved the final manuscript.

## References

- [1] Mafigiri R, Matovu JK, Makumbi FE, Ndyababo A, Nabukalu D, Sakor M, Kigozi G, Nalugoda F, Wanyenze RK. HIV prevalence and uptake of HIV/AIDS services among youths (15–24 Years) in fishing and neighboring communities of Kasensero, Rakai District, South Western Uganda. *BMC Public Health* 2017;17:251 <https://doi.org/10.1186/s12889-017-4166-2>
- [2] Global HIV & AIDS statistics - 2019 fact sheet. Available at: <https://www.unaids.org/en/resources/fact-sheet>. Accessed on 17-02-2020.
- [3] Berhan Y, Berhan A. A meta-analysis of risky sexual behaviour among male youth in developing countries. *AIDS Res Treat* 2015;2015. <https://doi.org/10.1155/2015/580961>
- [4] Mokdad AH. Trends in HIV/AIDS morbidity and mortality in Eastern Mediterranean countries, 1990-2015: findings from the Global Burden of Disease 2015 study. *Int J Public Health* 2017;1-14. <https://doi.org/10.1007/s00038-017-1023-0>
- [5] Kabbash IA, Felemban SM, Stephens GM, Al-Hakeem RF, Zumla AI, Memish ZA. HIV case notification rates in the Kingdom of Saudi Arabia over the past decade (2000–2009). *PLoS One* 2012;7:e45919. <https://doi.org/10.1371/journal.pone.0045919>
- [6] Lekalakala-Mokgele E. Exploring gender perceptions of risk of HIV infection and related behaviour among elderly men and women of Ga-Rankuwa, Gauteng Province, South Africa. *Sahara J* 2016;13:88-95. <https://doi.org/10.1080/17290376.2016.1218790>
- [7] Girum T, Wasie A, Lentiro K, Muktar E, Shumbej T, Difer M, Shegaze M, Worku A. Gender disparity in epidemiological trend of HIV/AIDS infection and treatment in Ethiopia. *Arch Public Health* 2018;76:51. <https://doi.org/10.1186/s13690-018-0299-8>
- [8] Badru T, Mwaisaka J, Khamofu H, Agbakwuru C, Adedokun O, Pandey SR, Essiet P, James E, Chen-Carrington A, Mastro TD, Aliyu SH. HIV comprehensive knowledge and prevalence among young adolescents in Nigeria: evidence from Akwa Ibom AIDS indicator survey, 2017. *BMC Public Health* 2020; 20:45. <https://doi.org/10.1186/s12889-019-7890-y>
- [9] White S, Chen J, Atchison R. Relationship of preventive health practices and health literacy: a national study. *Am J Health Behav* 2008;32:227-42. <https://doi.org/10.5993/AJHB.32.3.1>
- [10] Swendeman D, Rotheram-Borus MJ, Comulada S, Weiss R, Ramos ME. Predictors of HIV-related stigma among young people living with HIV. *Health Psychol* 2006;25:501. <https://doi.org/10.1037/0278-6133.25.4.501>
- [11] Helms CB, Turan JM, Atkins G, Kempf M-C, Clay OJ, Raper JL, Mugavero MJ, Turan B. Interpersonal mechanisms contributing to the association between HIV-related internalized stig-

- ma and medication adherence. *AIDS Behav* 2017;21:238-47. <https://doi.org/10.1007/s10461-016-1320-2>
- [12] Stringer KL, Turan B, McCormick L, Durojaiye M, Nyblade L, Kempf M-C, Lichtenstein B, Turan JM. HIV-related stigma among healthcare providers in the deep south. *AIDS Behav* 2016;20:115-25. <https://doi.org/10.1007/s10461-015-1256-y>
- [13] Jenkins C, Robalino DA. HIV/AIDS in the Middle East and North Africa: the costs of inaction. The World Bank 2003 Sep 15. <https://doi.org/10.1596/0-8213-5578-3>
- [14] Liljestrand P. HIV care: continuing medical education and consultation needs of nurses, physicians, and pharmacists. *J Assoc Nurses AIDS Care* 2004;15:38-50. <https://doi.org/10.1177/1055329003252053>
- [15] Ahsan Ullah AK. HIV/AIDS-related stigma and discrimination: A study of health care providers in Bangladesh. *J Int Assoc Physicians AIDS Care (Chic)* 2011;10:97-104. <https://doi.org/10.1177/1545109710381926>
- [16] Kermode M, Jolley D, Langkham B, Thomas MS, Crofts N. Occupational exposure to blood and risk of bloodborne virus infection among health care workers in rural north Indian health care settings. *Am J Infect Control* 2005;33:34-41. <https://doi.org/10.1016/j.ajic.2004.07.015>
- [17] Kok G, Gottlieb NH, Peters GJ, Mullen PD, Parcel GS, Ruitter RA, Fernández ME, Markham C, Bartholomew LK. A taxonomy of behaviour change methods: an Intervention Mapping approach. *Health Psychol Rev* 2016;10:297-312. <https://doi.org/10.1080/17437199.2015.1077155>
- [18] Kermanshah University of Medical Sciences (KUMS). Available at: <https://vc-health.kums.ac.ir/fa/news/28761>. Accessed on 7-12 -2016.
- [19] Suominen T, Koponen N, Mockiene V, Raid U, Istomina N, Vänskä ML, Blek-Vehkaluoto M, Välimäki M. Nurses' knowledge and attitudes to HIV/AIDS. An international comparison between Finland, Estonia and Lithuania. *Int J Nurs Pract* 2010;16:138-47. <https://doi.org/10.1111/j.1440-172X.2010.01822.x>
- [20] Mulaudzi MV, Pengpid S, Peltzer K. Nurses' knowledge, attitudes, and coping related to HIV and AIDS in a rural hospital in South Africa. *Studies on Ethno-Medicine* 2011;5:25-32. <https://doi.org/10.1080/09735070.2011.11886388>
- [21] Delobelle P, Rawlinson JL, Ntuli S, Malatsi I, Decock R, Depoorter AM. HIV/AIDS knowledge, attitudes, practices and perceptions of rural nurses in South Africa. *J Adv Nurs* 2009;65:1061-73. <https://doi.org/10.1111/j.1365-2648.2009.04973.x>
- [22] Saydkhani V, Albooghobeish M, Khosravi S, Banisakini H, Mousahosaini N. Evaluation of AIDS disease information between anesthesia practitioners in educational hospitals of Ahvaz Jundishapur University of Medical Sciences in 2010. *Jentashapir Journal of Health Research* 2012;3(2). <http://eprints.ajums.ac.ir/id/eprint/11823>
- [23] Kumar S, Jain P, Jangid N. HIV related knowledge and attitude among nurses and paramedical health care providers in Delhi. *Adhyayan: A Journal of Management Sciences* 2017;7:41-6. <https://doi.org/10.21567/adhyayan.v7i02.10759>
- [24] Mindry D, Maharaj P, Letsoalo T, Munthre C, Crankshaw T. Knowing client rights and meeting their needs: provider knowledge and attitudes toward meeting the reproductive needs and rights of people living with HIV in South Africa. *Global perspectives on women's sexual and reproductive health across the life course*. Springer 2018. p. 141-58. [https://doi.org/10.1007/978-3-319-60417-6\\_9](https://doi.org/10.1007/978-3-319-60417-6_9)
- [25] Kawale P, Mindry D, Phoya A, Jansen P, Hoffman RM. Provider attitudes about childbearing and knowledge of safer conception at two HIV clinics in Malawi. *Reprod Health* 2015;12:17. <https://doi.org/10.1186/s12978-015-0004-0>
- [26] Desai M, Gafos M, Dolling D, McCormack S, Nardone A. Healthcare providers' knowledge of, attitudes to and practice of pre-exposure prophylaxis for HIV infection. *HIV Med* 2016;17:133-42. <https://doi.org/10.1111/hiv.12285>
- [27] Hughes AK. HIV knowledge and attitudes among providers in aging: results from a national survey. *AIDS Patient Care STDS* 2011;25:539-45. <https://doi.org/10.1089/apc.2011.0026>
- [28] Jafari F, Kholdi N, Falah N, Mahmoudpour A. Factors related to knowledge and attitude about AIDS. *Daneshvar Medicine* 2007;14:1-8. <https://www.sid.ir/en/Journal/ViewPaper.aspx?ID=101182>
- [29] Oppong AK, Oti-Boadi M. HIV/AIDS knowledge among undergraduate university students: implications for health education programs in Ghana. *Afr Health Sci* 2013;13:270-7. <https://doi.org/10.4314/ahs.v13i2.11>
- [30] Mbanya DN, Zebaze R, Kengne AP, Minkoulou EM, Awah P. Knowledge, attitudes and practices of nursing staff in a rural hospital of Cameroon: how much does the health care provider know about the human immunodeficiency virus/acquired immune deficiency syndrome? *Int Nurs Rev* 2001;48:241-9. <https://doi.org/10.1046/j.1466-7657.2001.00090.x>
- [31] Ghorbani GhA, Mehrabi Tavana A, Atae RA. Knowledge assessment in nurses of Baqiyatallah (a.s) hospital about AIDS. *J Mil Med* 2006;8:91-6 <http://militarymedj.ir/article-1-204-en.html>

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