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CLINICAL & BASIC RESEARCH

Knowledge, Attitudes and Practices Related to HIV Stigma and Discrimination Among Healthcare Workers in Oman

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المعرفة والمواقف والممارسات المرتبطة بوصمة الإصابة بفيروس الأيدز HIV والتمييز لدى العاملين في مجال الرعاية الصحية بعمان

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ABSTRACT: ***Objectives:*** Stigma and discrimination undermine the quality of life of people with HIV and their access to health services. This study aimed to assess HIV-related knowledge, attitudes and practices among healthcare workers (HCWs) in Oman. ***Methods:*** This cross-sectional study took place between July and November 2016. A questionnaire was distributed to 1,400 government HCWs to determine HIV-related knowledge, attitudes and practices. ***Results:*** A total of 1,281 HCWs participated (response rate = 92%). Routine tasks, such as dressing wounds, drawing blood and touching clothes, were a cause of concern for 24–52% of HCWs. Only 69% correctly answered questions regarding the transmission of HIV via eating/drinking and mosquito bites. Compared to other HCWs, doctors had significantly higher knowledge (mean = 0.46, 95% confidence interval [CI]: 0.19 to 0.73; *P* <0.001), attitude (mean = 0.77, 95% CI: 0.31 to 1.24; *P* = 0.001) and practice (mean = 2.07, 95% CI: 1.59 to 2.55; *P* <0.001) scores. Expatriates also scored significantly higher in knowledge (mean = 1.08, 95% CI: 0.93 to 1.23; *P* <0.001), attitude (mean = 1.23, 95% CI: 0.98 to 1.48; *P* <0.001) and practice (mean = 1.08, 95% CI: 0.82 to 1.34; *P* <0.001) compared to Omani nationals. Finally, those with >15 years' work experience scored significantly higher on knowledge (mean = −0.60, 95% CI: −1.12 to −0.08; *P* = 0.025) and attitude (mean = −0.99, 95% CI: −1.87 to −0.10; *P* = 0.029) compared to those with less experience. ***Conclusion:*** The high rate of HIV-related stigma among HCWs in Oman should be rectified in order to achieve the 90-90-90 target set by the Joint United Nations Programme on HIV/AIDS.

Keywords: HIV; Social Stigma; Social Discrimination; Knowledge; Attitude; Professional Practice; Healthcare Providers; Oman.

الملخص: الهدف: يقوض التمييز والوصمة نوعية الحياة للمصابين بفيروس الأيدز، وحصولهم على الخدمات الطبية. وتهدف هذه الدراسة لتقييم المعارف والمواقف والممارسات المرتبطة بوصمة الإصابة بفيروس الأيدز HIV والتمييز لدى العاملين في مجال الرعاية الصحية بعمان. **الطريقة:** أجريت هذه الدراسة المقطعية العرضية ما بين يوليو ونوفمبر من عام 2016م. ووزع استبيان إلى 1,400 من العاملين بالحكومة في مجال الرعاية الصحية بعمان لتحديد معارفهم ومواقفهم وممارساتهم المتعلقة بوصمة الإصابة بفيروس الأيدز HIV والتمييز. **النتائج:** شارك في ملء الاستبيان 1,281 فردا (كانت نسبة الاستجابة 92%). وكانت الواجبات الروتينية، مثل تضميد الجروح، وسحب عينات الدم، ولمس الملابس مصدر قلق عند 52%–24 من العاملين في مجال الرعاية الصحية. وأجاب 69% فقط منهم على الأسئلة الخاصة بطرق انتقال الفيروس عن طريق الأكل أو الشرب وعض البعوض. ووجد أن للأطباء معارف أكثر من غيرهم من العاملين في مجال الرعاية الصحية (0.46 = المتوسط، 95% فاصل الموثوقية: 0.19 إلى 0.73؛ *P*<0.001). أما مواقف الأطباء فقد كانت أفضل من غيرهم من العاملين في المهن الصحية (0.77 = المتوسط، 95% فاصل الموثوقية: 0.31 إلى 1.24؛ *P* = 0.001). وكانت ممارسات الأطباء أفضل مقارنة بغيرهم من العاملين في المهن الصحية فقد كانت: (2.07 = المتوسط، 95% فاصل الموثوقية: 1.59 إلى 2.55؛ *P*<0.001). وأحرز الأجانب قيما أعلى في المعارف (1.08 = المتوسط، 95% فاصل الموثوقية: 0.93 إلى 1.23؛ *P*<0.001) والمواقف (1.23 = المتوسط، 95% فاصل الموثوقية: 0.98 إلى 1.48؛ *P*<0.001) والممارسات (1.08 = المتوسط، 95% فاصل الموثوقية: 0.82 إلى 1.34؛ *P*<0.001) من تلك التي أحرزها المواطنون. وأخيرا، وجد أن العاملين الذين لديهم خبرة في العمل أكثر من 15 عاما أحرزوا قيما أعلى في المعارف (0.60- = المتوسط، 95% فاصل الموثوقية: 1.12- إلى 0.08-؛ *P* = 0.025) والمواقف (0.99- = المتوسط، 95% فاصل الموثوقية: 1.87- إلى 0.10-؛ *P* = 0.029) و، ممن كانت لديهم خبرة أقل. **الخلاصة:** ينبغي العمل على إنقاص النسبة العالية للوصمة المرتبطة بفيروس الأيدز عند العاملين في مجال الرعاية الصحية بعمان حتى تبلغ 90-90-90، بحسب الهدف المنشود للبرنامج المشترك للأمم المتحدة حول فيروس الإيدز/ومرض الإيدز.

الكلمات المفتاحية: الوصمة الاجتماعية؛ التمييز الاجتماعي؛ المعارف؛ المواقف؛ الممارسات المهنية؛ مقدمو الرعاية الصحية؛ عمان.

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Advances in Knowledge

- *The findings of this study reveal HIV-related knowledge, attitudes and practices among governmental healthcare workers in Oman.*

Application to Patient Care

- *The present study forms a basis for future initiatives to reduce discrimination in healthcare settings, in turn enhancing patient care and improving the quality of life of people living with HIV.*

As per the joint united nations (UN) Programme on HIV/AIDS (UNAIDS), HIV stigma is the "process of devaluation" of people living with HIV, compounded by negative associations attached to the two primary methods of HIV transmission (i.e. sexual intercourse and intravenous drug use).[1] Subsequently, stigma may result in active discrimination, defined as "the unfair and unjust treatment of an individual based on his or her real or perceived HIV status".[1] Overall, negative judgements and actions towards people living with HIV tend to stem from pre-existing beliefs regarding gender, sexuality, race and class within a broader social context.[2]

Elements of stigma and discrimination can seriously undermine quality of life (QOL) and can create barriers to accessing and adhering to essential HIV services, both for people living with HIV and high-risk populations.[3–5] Many deficiencies in HIV prevention, testing and treatment services are due to the stigma associated with the disease shown by healthcare workers themselves.[6] In health settings, stigma and discrimination compromises the provision and quality of care, which is critical for helping patients adhere to medications and maintain overall health and well-being.[5] This study aimed to assess HIV-related knowledge, attitudes and practices among governmental healthcare workers in Oman.

Methods

This cross-sectional study was conducted from July to November 2016 and targeted healthcare workers employed in the governmental health sector in Oman. Doctors, nurses, counsellors, pharmacists and other healthcare workers at Ministry of Health institutions were invited to participate in the study; however, specialists working at specialised HIV treatment centres were excluded. Based on an estimated total population of 33,000 governmental healthcare workers, the necessary sample size was calculated to be 1,034 at a 95% confidence level and confidence interval of three.[7] Presuming a 75% response rate, 1,400 participants were recruited.

Participants were asked to complete a previously validated English-language questionnaire to measure HIV-related stigma and discrimination.[8–11] Specifically, the questionnaire measured attitudes and practices towards people living with HIV in health services, school and the community, as well as stigma related to the ideas of people living with HIV getting married and having children. In addition, in order to assess basic knowledge of HIV, the UN's standardised five-item HIV awareness questionnaire was incorporated into the survey.[11,12] The final questionnaire was tested in a pilot study of 50 healthcare workers, with no modifications subsequently deemed necessary. Accordingly, 1,400 copies of the questionnaire were distributed at all government health institutes in the country.

Initial data were collected and entered into a centrally-created data structure for each governorate, after which the data were cleaned, verified and compiled into a national database. Data entry and analysis were performed using an Excel spreadsheet, Version 2013 (Microsoft Corp., Redmond, Washington, USA) and R software (R Foundation for Statistical Computing, Vienna, Austria).

Categorical responses were presented as frequencies and percentages. In addition, responses to knowledge, attitude and practice questions were scored using a scaled-scoring method, with correct or positive responses given a score of one and incorrect and negative or missing responses given a score of zero. Questions with four responses (i.e. not worried, a little worried, worried and very worried) were given a score out of four according to the acceptability of the answer. Thereafter, the knowledge, attitude and practice scores were summed up for a total score.

Mean total knowledge, attitude and practice scores were analysed using multivariate linear regression. This allowed for comparison of the effect size (i.e. estimate of contrast) between groups, after controlling for other variables, and was used to examine the relationship between knowledge, practice and attitude scores and other characteristics. The regression was based on the presence or absence of various factors which were converted into 'dummy' variables and were scored as one if present and zero if absent. Pearson's correlation coefficient was used to determine correlations between knowledge and attitude scores, attitude and practice scores and knowledge and practice scores. The level of statistical significance was set at $P < 0.05$.

This study received ethical approval and was registered with the Directorate General for Disease Surveillance & Control, Ministry of Health. Participation in the study was purely voluntary and all data were collected anonymously.

Table 1: Sociodemographic characteristics of governmental healthcare workers in Oman (N = 1,281)

Characteristic	n (%)		
	Total	Male (n = 392)	Female (n = 889)
Nationality			
Omani	669 (52)	128 (33)	541 (61)
Expatriate*	574 (45)	256 (65)	318 (36)
Unknown	38 (3)	8 (2)	30 (3)
Marital status			
Married	1,050 (82)	337 (86)	713 (80)
Single	204 (16)	51 (13)	153 (17)
Previously married	14 (1)	1 (<1)	13 (1)
Unknown	13 (1)	3 (1)	10 (1)
Profession			
Staff nurse	594 (46)	63 (16)	531 (60)
Doctor	317 (25)	175 (45)	142 (16)
Pharmacist	131 (10)	54 (14)	77 (9)
Laboratory technician	98 (8)	44 (11)	54 (6)
Other†	103 (8)	48 (12)	55 (6)
Unknown	38 (3)	8 (2)	30 (3)

**Including Indians, Filipinos, Egyptians, Sudanese, Pakistanis, Tunisians, etc. †Including counsellors, physiotherapists, dental technicians, dieticians, X-ray technicians, health educators, refractionists, medical orderlies, etc.*

Results

A total of 1,281 healthcare workers participated in the study (response rate = 92%). Of these, 52% were Omani nationals and 82% were married. The majority were staff nurses (46%), followed by doctors (25%), pharmacists (10%), laboratory technicians (8%) and other workers (8%) [Table 1]. Regarding knowledge, there was varying awareness of HIV symptoms and transmission patterns. While 74% were aware that the use of a condom mitigated the risk of contracting HIV and 86% knew that HIV patients were of generally healthy appearance, only 69% correctly answered questions regarding the transmission of HIV via eating/drinking and mosquito bites [Table 2].

With regards to attitude, 50% of healthcare workers reported that they would not want to buy fresh vegetables from a vendor living with HIV. Moreover, 39% believed that people talk badly about individuals thought to be living with HIV and 41% thought that such individuals lose respect or stature in the community. As for marital and reproductive rights, 52% and 45% indicated that people living with HIV should have the right to marry and have children, respectively [Table 3].

Table 2: Knowledge of HIV symptoms and transmission methods among governmental healthcare workers in Oman (N = 1,281)

Questionnaire item and response	n (%)
Can having sex with only one faithful, uninfected partner reduce the risk of HIV/AIDS transmission?	
Yes	714 (56)
No	229 (18)
No answer*	338 (26)
Can using condoms reduce the risk of HIV/AIDS transmission?	
Yes	942 (74)
No	159 (12)
No answer*	180 (14)
Can a person who looks healthy have HIV/AIDS?	
Yes	1,097 (86)
No	74 (6)
No answer*	110 (9)
Can sharing a drinking glass or eating with an HIV/AIDS patient transmit the infection?	
Yes	287 (22)
No	882 (69)
No answer*	112 (9)
Can a person get HIV/AIDS from mosquito bites?	
Yes	186 (15)
No	885 (69)
No answer*	210 (16)

**Participants preferred not to respond.*

In terms of HIV-related practices, 27% of healthcare workers avoided physical contact when providing care/services to a person living with HIV, 24% were worried or very worried about touching their clothing, 47% were worried or very worried about dressing wounds, 52% were worried or very worried about drawing blood and 55% feared contracting HIV if they came into contact with their saliva [Table 4].

A multivariate linear regression analysis was carried out to determine associations between socio-demographic characteristics and mean knowledge, attitude and practice scores, after controlling for other variables. Compared to other healthcare professionals, doctors scored significantly higher in knowledge (mean = 0.46, 95% CI: 0.19 to 0.73; P <0.001), attitude (mean = 0.77, 95% CI: 0.31 to 1.24; P = 0.001) and practice (mean = 2.07, 95% CI: 1.59 to 2.55; P <0.001). In addition, nurses had significantly higher practice scores compared to laboratory technicians and pharmacists (mean = 2.16, 95% CI: 1.71 to 2.61; P <0.001). Pharmacists

Table 3: Attitudes related to HIV among governmental healthcare workers in Oman (N = 1,281)

Questionnaire item and response	n (%)
Do you think children living with HIV/AIDS should be able to attend school with children who are HIV-negative?	
Yes	959 (75)
No	311 (24)
No answer*	11 (1)
If a teacher has HIV/AIDS but is not sick, should he/she be allowed to continue teaching in school?	
Yes	1,024 (80)
No	247 (19)
No answer*	10 (1)
If you knew that an Omani vegetable vendor had HIV/AIDS, would you buy fresh vegetables from him/her?†	
Yes	614 (48)
No	644 (50)
No answer*	23 (2)
Do people talk badly about people living or thought to be living with HIV/AIDS?	
Yes	498 (39)
No	301 (23)
No answer*	482 (38)
Do people living or thought to be living with HIV/AIDS lose respect or stature in the community?	
Yes	521 (41)
No	363 (28)
No answer*	397 (31)
If a member of your family became infected with HIV/AIDS, would you want it to remain a secret?	
Yes	982 (77)
No	285 (22)
No answer*	14 (1)
If a member of your family became sick with HIV/AIDS, would you be willing to care for him or her in your household?	
Yes	1,136 (89)
No	133 (10)
No answer*	12 (1)
Would you be ashamed if someone in your family had HIV/AIDS?	
Yes	390 (30)
No	874 (68)
No answer*	17 (1)
Should people living with HIV/AIDS feel ashamed of themselves?	
Yes	284 (22)
No	978 (76)
No answer*	19 (2)
Should people living with HIV/AIDS have the right to marry?	
Yes	669 (52)
No	597 (47)
No answer*	15 (1)

*HCWs = healthcare workers. *Participants preferred not to respond. †Assuming that no municipality licence rules restrict the vendor from selling vegetables.*

Table 3 (cont'd): Attitudes related to HIV among governmental healthcare workers in Oman (N = 1,281)

Questionnaire item and response	n (%)
Should people living with HIV/AIDS be allowed to have babies?	
Yes	575 (45)
No	683 (53)
No answer*	23 (2)
In the past 12 months, have you observed any HCWs unwilling to care for people living with HIV/AIDS in your healthcare facility?	
Yes	110 (9)
No	1,120 (87)
No answer*	51 (4)

*HCWs = healthcare workers. *Participants preferred not to respond. †Assuming that no municipality licence rules restrict the vendor from selling vegetables.*

Table 4: Practices related to people living with HIV among governmental healthcare workers in Oman (N = 1,281)

Questionnaire item and response	n (%)
Do you avoid physical contact when providing care or services to a person living with HIV/AIDS?	
Yes	350 (27)
No	771 (60)
No answer*	160 (12)
How worried would you be if you touched the clothing of a person living with HIV/AIDS?	
Not worried	571 (45)
A little worried	301 (23)
Worried	191 (15)
Very worried	118 (9)
No answer*	100 (8)
How worried would you be if you had to dress the wound of a person living with HIV/AIDS?	
Not worried	171 (13)
A little worried	266 (21)
Worried	263 (21)
Very worried	329 (26)
No answer*	252 (20)
How worried would you be if you had to draw blood from a person living with HIV/AIDS?	
Not worried	180 (14)
A little worried	248 (19)
Worried	257 (20)
Very worried	406 (32)
No answer*	190 (15)
Do you fear contracting HIV if you come in contact with the saliva of a person living with HIV/AIDS?	
Yes	707 (55)
No	416 (32)
No answer*	158 (12)

**Participants either did not have direct patient care or preferred not to respond.*

Table 5: Associations between dependent variables and HIV-related knowledge, attitude and practice scores among governmental healthcare workers in Oman (N = 1,281)

Variable	Knowledge		Attitude		Practice	
	Mean score (95% CI)	*P* value	Mean score (95% CI)	*P* value	Mean score (95% CI)	*P* value
Profession						
Doctor	0.46 (0.19 to 0.73)	<0.001*	0.77 (0.31 to 1.24)	0.001*	2.07 (1.59 to 2.55)	<0.001*
Nurse	0.17 (–0.08 to 0.42)	0.190	0.50 (0.07 to 0.93)	0.024	2.16 (1.71 to 2.61)	<0.001*
Laboratory technician	0.14 (–0.19 to 0.46)	0.398	0.60 (0.05 to 1.16)	0.033*	0.16 (–0.41 to 0.74)	0.582
Pharmacist	–0.30 (–0.61 to 0.00)	0.049*	0.17 (–0.35 to 0.68)	0.523	–0.11 (–0.64 to 0.43)	0.694
Gender						
Female	–0.09 (–0.25 to 0.08)	0.296	–0.07 (–0.35 to 0.21)	0.610	–0.04 (–0.33 to 0.25)	0.778
Nationality						
Non-Omani	1.08 (0.93 to 1.23)	<0.001*	1.23 (0.98 to 1.48)	<0.001*	1.08 (0.82 to 1.34)	<0.001*
Years of experience						
<5	–0.32 (–0.84 to 0.21)	0.233	–0.76 (–1.65 to 0.13)	0.095	–0.26 (–1.19 to 0.67)	0.584
5–15	–0.32 (–0.82 to 0.19)	0.224	-0.64 (–1.5 to 0.23)	0.149	–0.41 (–1.31 to 0.49)	0.372
>15	–0.60 (–1.12 to –0.08)	0.025*	–0.99 (–1.87 to –0.10)	0.029*	–0.50 (–1.43 to 0.42)	0.284
Marital status						
Married	–0.19 (–0.9 to 0.52)	0.603	–0.63 (–1.84 to 0.58)	0.309	–0.68 (–1.93 to 0.58)	0.292
Previously married	–0.62 (–1.56 to 0.33)	0.200	–0.74 (–2.34 to 0.87)	0.369	–1.29 (–2.97 to 0.38)	0.129
Single	–0.32 (–1.05 to 0.40)	0.385	–0.33 (–1.57 to 0.90)	0.598	–0.58 (–1.87 to 0.70)	0.375

CI = confidence interval.

had the lowest scores for knowledge (mean = –0.30, 95% CI: –0.61 to 0.00), attitude (mean = 0.17, 95% CI: –0.35 to 0.68) and practice (mean = –0.11, 95% CI: –0.64 to 0.43).

Compared to Omani nationals, expatriates scored significantly higher in knowledge (mean = 1.08, 95% CI: 0.93 to 1.23; *P* <0.001), attitude (mean = 1.23, 95% CI: 0.98 to 1.48; *P* <0.001) and practice (mean = 1.08, 95% CI: 0.82 to 1.34; *P* <0.001). Finally, those with >15 years' work experience had significantly greater scores for knowledge (mean = –0.60, 95% CI: –1.12 to –0.08; *P* = 0.025) and attitude (mean = –0.99, 95% CI: –1.87 to –0.10; *P* = 0.029) compared to those with less experience [Table 5]. Positive linear correlations were noted between knowledge and attitude (r = 0.26), attitude and practice (r = 0.28) and knowledge and practice (r = 0.20), with all three correlations being statistically significant (*P* <0.05 each).

Discussion

According to the classifications of the World Health Organization, the HIV epidemic in Oman is at a low level.[13,14] This is in part due to the efforts of the national AIDS programme established in 1987 and various other measures, including community awareness and regular HIV testing and treatment. In addition, HIV services are provided by 14 specialised treatment centres located across the country. As of the end of 2018, a total of 3,025 cases of HIV had been reported, of which 1,532 (50.6%) were still living.[15] Most cases occurred among men (68%) and individuals aged 25–44 years old (59%); the greatest risk factor was reportedly heterosexual relations (66%).[15] In terms of treatment, 84.3% of people living with HIV received antiretroviral therapy, with 87.5% virally suppressed.[15]

Nevertheless, despite the low prevalence of HIV and the availability of treatment, there is still social stigma towards people living with HIV in Oman. In a study of 193 people living with HIV in Oman, 70% were unwilling to disclose their HIV status to their friends and family, while 61% were uncomfortable at the prospect of doing so.[16] The majority (61%) reported relying on their family for financial and emotional support; this is to be expected in a society where cultural traditions consider family to be of paramount importance. Despite the availability of social services, many did not accept government assistance, with 75% claiming fears of a breach of privacy as the primary reason for not doing so.[16]

The current study noted a relatively high rate of HIV-related stigma among healthcare workers in the country. A national survey of households in Thailand found that 52.1% of respondents would refuse to buy fresh food from a vendor if they knew that the seller had HIV.[17] As the same response was given by 50% of healthcare workers in the current study, this prejudicial attitude is likely to be even more prevalent in the Omani community. Indeed, discriminatory attitudes may be much more common among members of the general public, given that 39% and 41% of the healthcare workers believed that other people would talk negatively of those living with HIV and that affected individuals would lose respect or stature in the community, respectively.

In the current study, there were relatively good levels of knowledge regarding the use of condoms for HIV prevention (74%) and that people living with HIV often appear healthy (86%). However, knowledge was below expectations regarding HIV transmission methods (69%). A much higher percentage (94.5%) of 200 final-year medical students in Vietnam were aware of the usage of condoms for HIV prevention.[18] Moreover, 24–54% of healthcare workers in the present study were either worried or very worried about performing various day-to-day duties for patients living with HIV. This finding is comparable to other research; in Thailand, 32–66% of 738 healthcare providers were worried about similar duties, while 23–67% of more than 1,000 healthcare workers from multiple countries were similarly concerned.[8,19]

Stigma often leads to the avoidance of duties. In the present study, 9% of healthcare workers reported having observed others in their institution being unwilling to care for people living with HIV. A study of 922 nurses in Jordan found that 84% of nurses refused to provide care to patients who tested positive for HIV/AIDS.[20] Another study from Egypt reported that 72.3% of 65 nurses avoided providing care to patients with HIV/AIDS.[21] In a multinational study conducted in 15 countries and involving more than 1,000 healthcare workers, this statistic ranged from 23–30%.[8] However, in a study from Italy of 107 hospital nurses with good knowledge about HIV, only 2% refused to care for patients based on their HIV status.[22] Another study of 450 healthcare practitioners in India found that only 4.1% wished they were allowed to refuse to care for people with HIV/AIDS.[23]

In the present study, HIV-related knowledge, attitudes and practices were associated with profession; doctors had significantly greater knowledge, attitude and practice scores compared to other healthcare workers, while nurses had better practice scores compared to laboratory technicians and pharmacists. The latter finding might be explained in part by differences in professional duties, with nurses expected to be more 'hands on' in terms of patient care compared to other paramedical professions. In addition, the current study observed significantly higher mean knowledge, attitude and practice scores among expatriates. The exact reason for this result is unknown; however, the authors postulate that it may be because of educational and cultural differences. Finally, the present study also showed that more years of work experience yielded significantly higher knowledge and attitude scores.

It is a basic human right to choose to marry and/or have children, regardless of HIV status.[24] However, 47% and 53% of healthcare workers in the present study did not agree with the idea of such individuals having the right to marry and procreate, respectively. Similar findings were reported in a study in India, whereby 41% and 37% of 305 doctors, 77% and 73% of 369 nurses and 88% and 86% of 346 ward staff believed that men and women, respectively, with HIV should be forbidden to marry.[25] In a multinational study of over 1,000 healthcare workers, 40% were against people living with HIV having the right to procreate.[8]

The positive three-way correlation between knowledge, attitude and practice suggests that improving any one of these factors will have a positive impact on the other two. The findings of the current study have various implications, as they clearly demonstrate the need for more HIV-related interactive training for all healthcare workers in Oman. Such training is also recommended by UNAIDS to help reduce stigma and discrimination for people living with HIV.[6] In addition, an HIV-related stigma and discrimination awareness module should be incorporated into the undergraduate and postgraduate curriculum of all health science degrees. Finally, further research is needed to better understand the nature of HIV-related stigma and discrimination, both among healthcare workers and in the general community. Such measures will help reduce HIV-related stigma and discrimination in the healthcare system in Oman, a crucial requirement if the country aimed to achieve the 90-90-90 target set by UNAIDS by 2020.[26]

The strengths of this study lie in the nationwide participation of healthcare institutions and the large sample size involving a variety of healthcare professionals. In addition, the sample was fairly representative as every government health sector in Oman was given the opportunity to participate in the study. However, there were several limitations. The non-response bias was not measured; as participation was voluntary, it is likely that those who agreed to participate already held strong opinions on the topic. Moreover, the study assessed only healthcare workers employed in the government

sector, with variable responses across governorates. As such, those working in the private sector may have very different views and attitudes. In addition, the present study could not explain reasons for higher mean scores among expatriates compared to nationals; further study into this finding is necessary. Furthermore, like most other questionnaire-based studies, results in the present analysis may have been affected by response bias.

Conclusion

There was a high level of HIV-related stigma among healthcare workers in the governmental health sector in Oman. As such, measures to increase knowledge and support positive attitudes and practices should be implemented at all levels of the healthcare system, geared particularly towards Omani nationals. Such initiatives are necessary if the country is to meet the 90-90-90 target set by UNAIDS.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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