KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING HUMAN IMMUNODEFICIENCY VIRUS/ACQUIRED IMMUNE DEFICIENCY SYNDROME AND SEXUALLY TRANSMITTED INFECTIONS AMONG HEALTH CARE PROVIDERS IN LAHORE, PAKISTAN

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Background: Human Immunodeficiency Virus (HIV) infection is a global problem of extraordinary dimensions and has so far resulted in nearly 25 million deaths worldwide. Health care providers (HCPs) are considered to play a pivotal role in the provision of preventive and curative services to individuals suffering from HIV/AIDS and sexually transmitted infections. Pakistan, which was previously categorised as having a low-prevalence, high-risk HIV epidemic, is now facing a concentrated HIV epidemic among its most at-risk populations such as injecting drug users. The objective of this study was to assess the knowledge, attitudes and reported practices relating to HIV/AIDS and STIs among private and public sector health care providers providing clinical services in areas where women sell sex. **Methods:** This was an exploratory quantitative study, where a structured questionnaire was administered in face-to-face interviews with 200 HCPs from the public and private sectors. Knowledge about AIDS and correct diagnosis of STIs were defined as according to the national guidelines of NACP. Pearson's chi-square analysis was performed to test associations between predictors and level of knowledge of STIs in each group separately. Multivariate logistic regression analysis was employed to indicate predicting factors for correct management of STIs. **Results:** Forty-five percent of the HCPs had correct knowledge about the transmission and prevention of HIV, whereas 21% had seen a patient with advanced HIV infection, only two HCPs had been trained to manage such cases and 82% were not aware of syndromic management of STIs. Only 10% could cite the 'correct treatment' of gonorrhoea, syphilis and vaginal discharge. The odds of having the 'correct knowledge' of diagnosing gonorrhoea and syphilis were 2.1 (CI 95%, 1.2–3.8) if the HCP was a female medical doctor working in public sector. **Conclusion:** Further intensive training is needed to improve the ability of relevant HCPs to correctly diagnose and effectively treat patients infected with HIV and STIs.

Keywords: HIV/AIDS, Sexually transmitted infections (STI), health care providers (HCP), knowledge attitudes and practices (KAP), Pakistan

INTRODUCTION

HIV infection is a global health problem of extraordinary dimensions. HIV infection has so far resulted in an estimated 25 million deaths worldwide. Furthermore, HIV has contributed to overwhelming demographic changes in the most affected countries, especially in Sub-Saharan Africa. The epidemic is still ongoing but in some South East Asian countries, including Cambodia, Myanmar and Thailand, HIV prevalence has started to decline. In countries like Indonesia, Pakistan, and Vietnam, on the other hand, HIV prevalence is growing rapidly.[1]

Health care providers (HCPs) are considered to play a pivotal role in the provision of preventive and curative services to individuals suffering from HIV/AIDS and sexually transmitted infections (STIs). Pakistan, which was previously categorised as having a low-prevalence, high-risk HIV epidemic, is now facing a concentrated HIV epidemic among its most at risk populations such as injecting drug users (IDUs).[2] The heterogeneity and sexual interlinking of IDUs and women selling sex, combined with low levels of knowledge about HIV/AIDS and a relatively high prevalence of STIs, is likely to trigger a larger epidemic among those most at risk and in the general population. This may further increase burden on the health care delivery system in Pakistan.[3–6]

Health care delivery in Pakistan has 2 main pillars—private and public sector. The private sector is for profit and offers mostly curatives services. The first level of public sector health care is the community-based lady health workers followed by the primary, secondary and tertiary levels of service delivery.

Public sector health care in Pakistan is sub-optimally utilised with only about 20% of the population using it. The private sector, though assumed to be providing the major share (80%) of health care, remains mostly unregulated.[7] The knowledge, attitudes and practices (KAP) of HCPs in Pakistan regarding HIV/AIDS and STIs, as well as how well prepared they are for their role in terms of experience and training, remain mainly unknown.

The objective of the study was to assess KAP relating to HIV/AIDS and STIs among private and public sector HCPs providing clinical services in a number of residential areas in Lahore, Pakistan, where women sell sex.

METHODS

The present study is part of a larger research project related to women selling sex in Lahore, Pakistan.[8] A cross-sectional, exploratory quantitative study was conducted among HCPs from both private and public sector in the city, recruiting HCPs from 3 areas where women sell sex.[8] To minimize the possibility of social exclusion due to the stigma attached to HIV/AIDS and STIs, the names of the 3 areas are withheld.

Since the KAP of HCPs regarding HIV/AIDS and STIs in Pakistan was mainly unknown, we assumed the proportion with correct knowledge about HIV/AIDS based on the National AIDS Control Program (NACP), Pakistan to be 50%. In order to present descriptive statistics to calculate proportions with a 95% confidence interval (CI) and a width of 20%, a sample size of 100 observations was needed.[9] However, since the aim was to assess the level of knowledge about HIV/AIDS and STIs among HCPs in the private and the public sector, the same assumption was applied to both the groups and henceforth, a total sample size of 200 was needed.

Private sector HCPs registered with the Green Star Social Marketing (GSM) network were recruited. At the time of the study, there were 560 HCPs in the GSM network of Lahore. However, only 103 HCPs of these were providing clinical services to women selling sex in the three areas surveyed and 100 of these were included in the present study. In the private sector, universal sampling was done. In the public sector, four tertiary care hospitals were in the vicinity of the 3 surveyed areas. The HCPs (n=100) from these hospitals were doctors from the Department of Obstetrics and Gynaecology. The doctors working in the respective units and providing services on the day of the visit of the interview team were included. Accordingly, a total of 200 HCPs from private and public sector were included in the present study.

A questionnaire was developed, based on an earlier qualitative study conducted in the same areas.[8] The questionnaire was developed in English, translated into Urdu and pre-tested among HCPs offering medical care in another part of Lahore. The first author and another 6 enumerators, all of whom had previous experience of quantitative research methods, did the pre-testing. During 3 days, the entire study team received training on study design, methodology, and administration of structured questionnaire. The questionnaire was then tested again, and finally revised.

The questionnaire, administered in face-to-face interviews, addressed demographic characteristics, knowledge and attitudes regarding HIV/AIDS and STIs, as well as STI management practices. Knowledge about AIDS was defined as "correct" if the HCPs could cite two correct modes of transmission and prevention of HIV each, one of which had to be sexual intercourse for transmission and condom use for prevention of HIV (as defined by National AIDS Control Program (NACP), Islamabad, Pakistan. Knowledge about the diagnosis and treatment of STIs was considered as 'correct' based on the national guidelines on STI management.[10]

Epi Info software version 6.04D was used for data entry. Data were processed and analysed using SPSS-13. Frequencies, proportions, mean, minimum, and maximum were used for the analysis. Pearson's chi-square analysis was performed to test associations between predictors and level of knowledge of STIs in each group separately. Multivariate logistic regression analysis was employed to indicate predicting factors for correct management of STIs. Factors included in the analysis were age, education, place of work, knowledge about HIV/AIDS, knowledge about STIs, correct knowledge of diagnosis and treatment of STIs. Study protocols, questionnaires and consent forms were approved by Ethical Committee of Pakistan Medical Research Council, Islamabad, Pakistan, and Regional Ethics Committee, Stockholm, Sweden. Participation was confidential and informed written consent was obtained from each participant.

RESULTS

There was no refusal from the private sector HCPs. Among the HCPs from the public sector, 110 were approached and 100 consented to participate in the study. Accordingly, a total of 200 HCPs from the private (n=100) and public (n=100) sector were interviewed. The median age of the HCPs was 30 years (range 22–71), and 61% were female (Table-1).

Table-1: Background characteristics of health care providers providing health care to female sex workers in Lahore, Pakistan

	Private sector (n=100)	Public sector (n=100)	Total (n=200) Number (%)
Age (years)			
22–30	24	84	108 (54)
31–40	30	15	45 (22.5)
41–50	30	1	31 (15.5)
51–60	11	0	11 (5.5)
61–71	5	0	5 (2.5)
Sex			
Female	39	83	122 (61)
Male	61	17	78 (39)
Profession			
Doctor	31	99	130 (65)
Chemist	32	0	32 (16)
Lady health visitor	25	0	25 (12.5)
Homeopathic doctors	8	1	9 (4.5)
Hakim*	4	0	4 (2)

*Hakim is a health care provider who makes, prescribes and dispenses medicines prepared out of herbs

Forty-five percent of the HCPs had 'correct' knowledge of the transmission and prevention of HIV/AIDS (private 45%; public 46%). Furthermore, 63% had correct knowledge about the transmission of AIDS (private 69%; public 57%). In addition, 73% had correct knowledge about preventive measures (private 62%; public 85%). Among the HCPs, only 42 (21%) had seen a patient with advanced HIV infection (private 19%; public 23%). Among these 42, nine HCPs claimed to have treated them clinically. Only two HCPs, both in the public sector, had been trained to treat cases of advanced HIV infection.

The HCPs were asked to name all the STIs they were aware of (Table 2). Compared to the private sector, the HCPs from the public sector were more aware of STIs, modes of transmission and preventive measures. Among the HCPs, 78% cited gonorrhoea as an STI, followed by AIDS (70%), syphilis (68%) and HIV (43%). Only 13%, 14%, and 21% recognized *Trichomonas vaginalis* infection, chlamydial infection, and herpes infection as STIs. Most of the HCPs (86%) were aware that STIs could be transferred through sexual contact. Furthermore, 40% cited blood transfusion, followed by sex without condom (37%) as modes of transmission. When asked about preventive measures, 69% of the HCPs expressed that using a condom could prevent STIs, followed by 40% who cited transfusion of screened blood, and 39% considered being faithful to their partner was necessary to prevent STIs (Table-2).

Among the HCPs, an equal proportion from both sectors (18%) expressed apprehension and/or fear of treating patients with HIV/AIDS and STIs primarily revolved around the fear of acquiring HIV/AIDS and STIs themselves.

The HCPs from the private sector reported treating a median of 20 patients with STIs per month (range 2–80); whereas public sector HCPs were managing half that number, i.e., 10 per month (range 4–60).

The HCPs claimed to diagnose patients with STIs based only on signs and symptoms in 35% of cases, based only on laboratory diagnostics in 9% of cases, and based on both in 11% of cases.

Among the HCPs, 82% were not aware of the terminology "syndromic management of STIs". Amongst the remaining 18% who claimed to know about syndromic management of STIs, only 7% had received training in the subject for a median of five days (range 2-7 days). Furthermore, when asked if they were using syndromic management for management of STIs, 12% and 24% from the private and public sector respectively reported that they did.

For treatment of the STIs, antibiotics were prescribed to a median of twenty STI patients per month. The decision to prescribe antibiotics was based on observation of signs in 59% of cases, symptoms in 64% of cases, and results of laboratory tests and following the syndromic management guidelines in 11% of cases each.

Table-2: Knowledge regarding STIs among health care providers providing health care to female sex workers in Lahore, Pakistan

	Private Sector (n=100)	Public Sector (n=100)	Total n=200 No. (%)
Can you please name all STIs that you are aware of?			
Gonorrhoea	74	83	157 (78)
AIDS	64	76	140 (70)
Syphilis	55	81	136 (68)
HIV	30	55	85 (43)
Herpes infection	17	24	41 (21)
Chlamydial infection	10	18	28 (14)
Trichomonas infection	13	13	26 (13)
Hepatitis	11	15	26 (13)
Others (Premature ejaculation, cancer, allergy, diabetes)	15	0	15 (7)
How do you think STIs are transmitted?*			
Sexual intercourse	83	89	172 (86)
Blood transfusion	39	41	80 (40)
Sex without condoms	35	39	74 (37)
Mother to child	18	17	35 (17)
Oral sex	10	20	30 (15)
Using the same toilet	11	8	19 (9)
Eating in the same utensil	3	3	6 (3)
How do you think STIs can be prevented?*			
Using condoms	61	76	137 (69)
Transfusion of screened blood	27	52	79 (40)
Faithful to partner	37	41	78 (39)
Abstinence	28	16	44 (22)
Antibiotic resistance*			
Have you ever heard about antibiotic resistance?	96	54	150 (75)
Have your patients to whom you have prescribed antibiotics come back to you complaining of treatment failure?	32	12	44 (22)
What are the possible consequences of untreated or incorrectly treated STI?*			
Infertility	38	45	83 (41)
Miscarriage	13	27	40 (20)
Cervical cancer	21	13	34 (17)
Ectopic pregnancy	13	15	28 (14)
Still birth	14	12	26 (13)
Premature birth	8	16	24 (12)
What do you do to trace the route of transmission of an STI?*			
Ask about sexual behaviour	64	66	130 (65)
Ask about partners	24	40	64 (32)
Nothing	24	22	46 (23)
Partner identification	13	9	22 (11)
Diagnosis of gonorrhoea			
Correct according to guidelines	76	83	159 (80)
Diagnosis of syphilis			
Correct according to guidelines	35	61	96 (48)
Treatment of gonorrhoea			
Correct according to guidelines	15	43	58 (29)
Treatment of syphilis			
Correct according to guidelines	14	44	58 (29)
Treatment of vaginal discharge			
Correct according to guidelines	24	43	67 (33)

*multiple answers applied

Regarding knowledge about the correct diagnosis and treatment of STIs, only 20 (10%) HCPs could correctly cite the recommended treatment for gonorrhoea, syphilis and vaginal discharge.

The correct knowledge of diagnosis of gonorrhoea and syphilis and recommended treatment for gonorrhoea, syphilis and vaginal discharge were also analysed with predictors including age, sex, and profession as a doctor or non-doctor, sector of work (private vs. public) (Table-3).

In addition, logistic regression was applied to correct knowledge of diagnosis of gonorrhoea and syphilis and also to correct knowledge of treatment of gonorrhoea, syphilis and vaginal discharge with predictors including age, sex, and profession as a doctor or non-doctor, sector of work (public vs. private). The odds ratio of having the correct knowledge to diagnose gonorrhoea and syphilis was 2.1 (CI 95%, 1.2–3.8), if the HCP was a female medical doctor working in the public sector as compared to otherwise.

Table-3: Association between predictors, and correct knowledge about diagnosis and treatment of STIs by participating HCPs in Lahore, Pakistan

Outcome	Factors	Number (%)	Odds ratio	Confidence interval (95%)
Correct knowledge of diagnosis of gonorrhoea	Male Female	73 (46) 86 (54)	1.3	1.1–1.5
Correct knowledge of diagnosis of syphilis	Working in private sector Working in public sector	35 (35) 61 (61)	2.9	1.6–5.1
	Non-doctor Doctor	19 (27.1) 77 (59.2)	2.1	1.4–3.2
Correct knowledge of recommended treatment of gonorrhoea	Age >31 years Age ≤30 years	15 (26) 43 (74)	2.5	1.4–4.1
	Working in private sector Working in public sector	14 (24) 44 (76)	3.2	1.8–5.5
	Non-doctor Doctor	7 (12) 51 (88)	3.9	1.8–8.1
Correct knowledge of recommended treatment of vaginal discharge	Age >31 years Age ≤30 years	21 (31) 46 (69)	1.8	1.2–2.9
	Working in private sector Working in public sector	24 (36) 43 (64)	1.8	1.1–2.7
	Non-doctor Doctor	12 (18) 55 (82)	2.4	1.4–4.2

DISCUSSION

A low level of knowledge about the correct diagnosis and treatment of STIs was compounded by a negative attitude towards treating patients with HIV/AIDS and STIs among the HCPs. Forty-five percent of the HCPs had 'correct knowledge' of HIV/AIDS, according to the definition laid down by NACP, Pakistan. Furthermore, only 2 (1%) HCPs were trained to clinically treat patients suffering from HIV infection. In Pakistan, which is facing a concentrated epidemic of HIV, a low level of knowledge about HIV/AIDS among HCPs, coupled with too few of them being trained in the management of people living with HIV, suggests a suboptimally functioning health system. Abrams *et al* describe a similar picture from Harlem, New York, USA, where an insubstantial health system was challenged to respond to an epidemic whose diversities were still unknown.[11] However, an ideal response of the health care system to the HIV epidemic requires both political and economical commitments, as well as integrated reorganisation of the health workforce.[12,13]

In this study, the public sector HCPs had more knowledge about STIs than private-sector HCPs. Sihavong *et al* in the Lao People's Democratic Republic also found that physicians working in the public sector had a higher level of knowledge.[14] Furthermore, in this study the younger HCPs had more knowledge and a more positive attitude towards treatment of HIV/AIDS and STIs. This could be attributed to a newly introduced community-based medical education program in the medical schools of Pakistan.[15] In Vietnam, Quach *et al* found that although younger physicians tended to be better informed, older physicians were more likely to have a positive attitude towards people living with HIV. This was attributed to a social construct as the Vietnamese society expects older people to be more tolerant and sympathetic.[16] The low level of knowledge about *T. vaginalis* infection, chlamydial and herpes infection remains a major gap in the knowledge base of the HCPs. A similar situation was assessed and addressed in the United Kingdom through an intensive training program, which has resulted in higher levels of knowledge about STI management and less negative attitudes.[17]

Many HCPs (69%) considered that condom use could prevent STIs. In Pakistan, condom use stands at 6.8%, and condoms are primarily utilized for family planning purposes.[18] Sex work in Pakistan is considered a taboo.[19,20] The intervention to motivate individuals to use a condom while having sex with a woman selling sex is a formidable challenge. The negative attitude of 18% of the HCPs towards patients suffering from

HIV/AIDS and STIs is a concern as this can lead to discriminatory behaviours. Reis *et al* found that HCPs in Nigeria were reluctant to deal with patients suffering from HIV/AIDS.[21] This was common among HCPs working in environments with little availability of universal precautions. Poor knowledge about preventive measures of communicable diseases due to low levels of knowledge have also been known to occur in low income settings like Pakistan.[22]

Most (82%) of the HCPs in our study were not aware of syndromic management of STIs. Of the ones who were aware of the syndromic management, only 7% reported that they had received formal training. Notwithstanding the fact that syndromic management of STIs is both time and resource-efficient, several shortcomings have been recorded in the syndromic management algorithms. Many studies conducted from the initial period of administration of the syndromic management of STIs to the present day have pointed out highly varying levels of sensitivity, specificity and a low positive predictive value (PPV) of the algorithms, while using laboratory-based etiological diagnosis as the golden standard, leading to over-prescription of antibiotics and consequently more widespread antibiotic resistance.[23] Ray *et al* evaluated the performance of the syndromic management algorithm in 2009 and revealed a high sensitivity (93.8%) yet a low level of specificity in the detection of STIs.[24] A study in China did not show the same results and the sensitivity of the syndromic management of STIs was only 10%.[25,] Studies conducted in Jamaica,[26] Vietnam,[27] and Lao PDR,[28] described PPVs ranging from 11–44% for different STIs.

An important element of the syndromic management of STIs is antibiotic resistance. In the present study, 75% of the HCPs had heard about antibiotic resistance and 21% reported patients coming back with complaints of treatment failures, which were not necessarily due to antibiotic resistance. Low level of knowledge about clinical management of STIs and incorrect diagnosis and antibiotic prescription patterns might be other reasons. Whereas the knowledge of the HCPs in the current study focused on prescribing ciprofloxacin for the treatment of gonorrhoea, there is a need to assess its effectiveness in the Pakistani context. Studies performed worldwide have shown that ciprofloxacin resistance is high and, in most countries, it has been phased out for treatment.[29,30] Instead, expanded-spectrum cephalosporins, such as cefixime (oral) or ceftriaxone (injectable) are currently the ideal first line treatment options in most countries.[31]

Our study found that only 10% of the HCPs could cite the correct treatment of gonorrhoea and syphilis. Another study done in Pakistan by Khandwalla *et al* found that 50% of the doctors could correctly cite the recommended treatment of gonorrhoea. However this study was done in soon after the introduction of syndromic management of STIs by WHO.[32] Furthermore, being a female doctor working in public sector was strongly associated with the likelihood of having adequate knowledge to correctly diagnose a patient with gonorrhoea and syphilis. Lan *et al* also found a correlation in rural Vietnam between being a physician and working at a higher level of service delivery and the correct management of STIs.[33]

CONCLUSION

In conclusion, even though HCPs in Lahore were providing health care for both HIV/AIDS and STI patients, the low levels of knowledge and practices and poor attitudes regarding the management of HIV infection and STIs emphasize that further intensive training is needed to improve their ability to correctly diagnose and subsequently treat patients infected by STIs.

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