



HIV/AIDS KNOWLEDGE AMONG ADULT MALE MIGRANT FACTORY WORKERS OF AN INDUSTRIAL CITY IN NORTH INDIA

SA Rizwan¹, Sanjay Rai², Kiran Goswami³, Puneet Misra², Shashi Kant³

Financial Support: None declared
Conflict of interest: None declared

Copy right: The Journal retains the copyrights of this article. However, reproduction of this article in the part or total in any form is permissible with due acknowledgement of the source.

How to cite this article:

Rizwan SA, Rai S, Goswami K, Misra P, Kant S. HIV/AIDS knowledge among adult male migrant factory workers of an industrial city in north India. Ntl J of Community Med 2015; 6(2):103-109.

Author's Affiliation: ¹Assistant Professor, Dept. of Community Medicine, Velammal Medical College Hospital and Research Institute, Madurai, ²Additional Professor; ³Professor, Centre for Community Medicine, All India Institute of Medical Sciences, New Delhi

Correspondence:

Dr. Shashi Kant
E-mail: skant76@gmail.com

Date of Submission: 24-04-15

Date of Acceptance: 25-06-15

Date of Publication: 30-06-15

ABSTRACT

Background: Male migrant workers are considered an important risk group for propagation of HIV/AIDS in concentrate epidemic situation like that seen in India. Aim of the study was to describe the socio-demographic profile and HIV/AIDS knowledge of adult male migrant workers in an industrial city in north India.

Method: It was a cross sectional survey conducted in 2011. Male migrant workers aged ≥ 18 years, who were born outside Haryana, who had moved to current location after 15 years of age, who had worked in current factory for at least one year were eligible for face-to-face interview using semi-structured questionnaire. Knowledge score was calculated by taking into account 22 variables. Total score range was 0 to 22 and was classified into three categories as $\geq 80\%$ (comprehensive), 50% to 79% (moderate) and $\leq 49\%$ (poor).

Results: A total of 755 completed the interview. About 50% of the men had migrated before 21 years of age and their mean (SD) duration of migration was 9.5 (6.7) years. Several misconceptions such as transmission through mosquito bite, kissing on cheeks and hugging, and prevention by not sharing utensils were prevalent. Mean (SD) knowledge score was 14.7 (6.6). Almost 60% of participants did not have comprehensive HIV/AIDS knowledge.

Conclusion: This study reveals that there is an urgent need to fill knowledge gaps among migrant workers that may prove vital to prevent further spread of HIV/AIDS in concentrated epidemics.

Keywords: HIV/AIDS knowledge, factory workers, male migrants, India.

INTRODUCTION

The overall growth of Human Immunodeficiency Virus/Acquired Immunodeficiency Disease Syndrome (HIV/AIDS) epidemic appears to have stabilized both globally and in India but the rate of new infections is still high.^[1,2] In India, HIV prevalence among adult males was 0.36% in

2009 and the epidemic was concentrated among high risk groups.^[2] Male migrants form one of the high risk groups, but specifically they are known as 'bridge' population because they act as a bridge for transmission between core risk groups like Female Sex Workers (FSWs) and the low risk general population who are mostly their spouses. HIV prevalence among male migrants

was estimated to be 0.99% in 2008-09 which was three time higher than the general population.³

Male migrants in India often migrate alone, leaving their wives and families behind, usually to work in the informal sector which is unorganised and unregulated and accounts for 93% of the total workforce in India. This amounts to 392 million people or almost 40% of the country's population.⁴ Numerous factors expose migrant workers to HIV risk such as separation from families, language barriers, discrimination, social exclusion, substandard living conditions and exploitative working conditions. Worldwide, nearly 13 million labourers had died of AIDS by 2000 which had adversely affected national economies.⁵ Their vulnerability was recognised by The Declaration of Commitment on HIV/AIDS, United Nations General Assembly Resolution A/RES/S-62/2, June 2001 which recommended a commitment by governments to respond to HIV/AIDS in workplaces by increasing prevention and care programmes.⁶ As a result, National AIDS Control Organization (NACO) has partnered with Confederation of Indian Industries (CII) and other corporate entities on workplace intervention for HIV/AIDS. The country is also likely to gain more monetary returns by preventing HIV in workplace rather than by curative intervention.⁵ Also, workplace becomes the most suitable platform for mainstreaming HIV/AIDS prevention activities because more than 90% of HIV infections are in the productive age group. With this in view, the Government of India had recently adopted the 'National policy on HIV/AIDS and the world of work' which is a major step in this direction.⁷ Lack of knowledge regarding HIV/AIDS lead migrant workers to engage in risky sexual behaviour and help the spread of HIV/AIDS in the general population. Hence, we conducted this study with the aim of describing the socio-demographic profile of adult male migrant workers in an industrial city in north India and to determine their level of knowledge regarding HIV/AIDS.

METHOD

This was a facility based cross sectional survey conducted in two factories located at Ballabgarh block of Haryana. One of the sites was a steel bars producing unit with approximately 1500 workers, located two kilometre from Primary Health Centre (PHC), Chhainsa and the other site was a turbine parts manufacturing unit with

approximately 2000 workers, located four kilometre from Comprehensive Rural Health Services Project (CRHSP) hospital, Ballabgarh. The study population consisted of all adult male migrants aged 18 years and above. Data were collected during the months of June and July, 2011. Male migrant workers aged 18 years or above, who were born outside Haryana, who had moved to current location after 15 years of age, who had worked in the current factory for at least one year, who were willing to participate and able to give valid consent were eligible for inclusion in the study. Face to face interview was conducted using pretested semi-structured questionnaire. Sample size calculation was based on the assumption that the proportion of men with comprehensive HIV/AIDS knowledge (see later) was 50%, and for an alpha error of 5%, a power of 80% and relative precision of 10%, a sample size of 400 was calculated. For a non-response rate of 20%, the final sample size was calculated as 530.

Due to operational constraints a random sample could not be obtained. Instead, workers attending the factory clinic were approached to take part in a consecutive manner (Figure 1). In order to maintain data quality not more than 20 interviews were conducted in a single day. Although not as robust as a random sample, consecutive sampling is an accepted methodology widely used in HIV Sentinel Surveillance activities in India.⁸ Basic demographic characters of those who were eligible but refused to participate were collected. Ethical approval was obtained from IRB of the All India Institute of Medical Sciences, New Delhi. Informed written consent was obtained for all the participants. Free condoms, information booklets and general medical consultation for health related issues were provided. For further management, participants were referred to CRHSP hospital at Ballabgarh. All analyses were done using Stata/IC 11.1 (StataCorp LP, College Station, TX). Data were described in terms of proportions, means, standard deviations and 95% Confidence Intervals (CI) wherever applicable. A knowledge score was calculated by taking into account 22 variables (Box 1). Each correct answer was accorded one point and a wrong answer or 'don't know' response was accorded zero point. The total score range was 0 to 22 and was grouped based on proportion of the maximum possible score obtained, into three categories i.e. $\geq 80\%$ (comprehensive), 50% to 79% (moderate) and $\leq 49\%$ (poor).

RESULTS

Socio-demographic characteristics: A total of eligible 767 men were approached for participation and 755 (98%) completed the interview. The mean (SD) age of the participants was 31.4 (8.2) years and nearly 70% belonged to the 25-45 years age group. Nearly 90% were literate and almost 90% were semi-skilled workers. The mean (SD) monthly salary was Rs.5781 (3368) and almost 80% of them received less than or equal to Rs.6000. Three fourth were married but among them nearly half were not staying with their spouses at the current residence. Among unmarried men and married men who were not currently staying with their spouses, nearly 60% were living in rented houses, of whom more than half were living with roommates (who were mostly friends). Participants who refused to participate or complete the interview were not different from the participants with regards to the socio-demographic characteristics. (Table 1)

Characteristics of migration: Bihar was the place of origin for about 45% of the participants. The mean (SD) age at migration was 21.8 (4.9) years and nearly half had migrated for work related purposes before the age of 21 years. The mean (SD) number of places migrated for work related purposes was 3.6 (2.9) with majority having migrated to two to five places in their lifetime. The mean (SD) total duration of migration was 9.5 (6.7) years and nearly 65% had completed at least six years of migration. Mobility index for each participant was calculated by dividing the number of places migrated by the total duration of migration. The larger the index the more mobile the person was i.e., migration to greater number of places in a shorter duration. The mean (SD) mobility index was 0.5 (0.2) and nearly one third of them had an index greater than 0.5. The mean (SD) duration of stay in Haryana was 3.9 (3.1) years and majority had completed at least three years of stay in Haryana. The mean (SD) number of home visits made in the last one year was 3.5 (2.1) and nearly half of them had gone home for less than or equal to three times in the last one year. (Table 1)

Knowledge about HIV/AIDS: Almost all (94%) the participants had heard about HIV/AIDS. Knowledge regarding routes of transmission was assessed using a set of nine questions. Misconceptions such as transmission through mosquito bite, kissing on cheeks and hugging were prevalent but majority had correct knowledge on

routes of transmission by unprotected sex, from mother to child and by blood and needles.

Table 1: Socio-demographic characteristics of male migrant workers in selected factories of Faridabad

Variable	N=255 (%)
Age group (years)	
15-19	31 (4.1)
20-24	161 (21.3)
25-45	522 (69.1)
> 45	41 (5.4)
Educational status	
Illiterate	70 (9.3)
Primary	177 (23.4)
Middle school	119 (15.8)
Secondary	154 (20.4)
Higher secondary	144 (19.1)
Graduate	91 (12.1)
Type of work	
Skilled	92 (12.2)
Semiskilled / Unskilled	663 (87.8)
Net salary received in the last month (INR)	
≤6000	624 (82.6)
>6000	131 (17.4)
Marital status	
Married and staying with spouse	318 (42.1)
Married but not staying with spouse	262 (34.7)
Unmarried	175 (23.2)
Migrated from	
Bihar	343 (45.4)
Uttar Pradesh	281 (37.2)
Rajasthan	100 (13.2)
Other states	31 (4.1)
Age at which migrated for work purposes (years)	
<21	406 (53.8)
21-25	206 (27.3)
>25	143 (18.9)
Number of places been to for work	
1	167 (22.1)
2-5	449 (59.5)
>5	139 (18.4)
Number of years of migration (completed years)	
<6	264 (35.0)
6-10	192 (25.4)
11-15	164 (21.7)
>15	135 (17.9)
Mobility index	
<0.26	234 (31.0)
0.26-0.50	287 (38.0)
>0.50	234 (31.0)
Duration of stay in Haryana (years)	
1-2	292 (38.7)
3-4	226 (29.9)
>4	237 (31.4)
Number of hometown visits in the last one year	
≤3	416 (55.1)
>3	339 (44.9)

Table 2: HIV/AIDS knowledge of male migrant workers in selected factories of Faridabad.(n=713)

Variables	Yes	No	Don't know
Routes of transmission			
Mosquito bite	158 (22.2)	422 (59.2)	133 (18.7)
Having sex without condom	663 (93.0)	-	50 (7.0)
Kissing on cheeks	295 (41.4)	310 (43.5)	108 (15.1)
By hugging a person	211 (29.6)	396 (55.5)	106 (14.9)
Mother to her child	488 (68.4)	88 (12.3)	137 (19.2)
Through breast feeding	361 (50.6)	198 (27.8)	154 (21.6)
Using public toilet	103 (14.4)	493 (69.1)	117 (16.4)
Through infected blood	620 (87.0)	26 (3.6)	67 (9.4)
Sharing used needles	621 (87.1)	24 (3.4)	68 (9.5)
Modes of prevention			
Regular condom use	662 (92.8)	-	51 (7.2)
using mosquito nets	140 (19.6)	443 (62.1)	130 (18.2)
Not sharing utensils	173 (24.3)	391 (54.8)	149 (20.9)
Having sex with one uninfected faithful partner	660 (92.6)	-	53 (7.4)
Not having sex with commercial sex worker	660 (92.6)	-	53 (7.4)
Not sharing needles	633 (88.8)	18 (2.5)	62 (8.7)
Avoiding blood contact	634 (88.9)	17 (2.4)	62 (8.7)
Knowledge about Care, Support and Treatment (CST)			
Any tests to detect HIV/AIDS	590 (82.7)	6 (0.8)	117 (16.4)
Know any place where free testing for HIV/AIDS is provided? (n=590)	343 (58.2)	247 (41.8)	-
Drugs available for treatment of HIV/AIDS	402 (56.4)	51 (7.2)	260 (36.5)
Know any place where free treatment for HIV/AIDS is given?	204 (50.7)	198 (49.3)	-
Can HIV/AIDS be cured?	62 (8.7)	423 (59.3)	228 (32.0)

Table 3: HIV/AIDS knowledge score among male migrant workers in selected factories of Faridabad (n = 755)

Knowledge score categories	Nos.	% (95% CI)
≥80% (Comprehensive)	308	40.8 (37.3-44.3)
50-79% (Moderate)	311	41.2 (37.7-44.7)
≤49% (Poor)	136	18.0 (15.4-21.0)
Knowledge score (out of 22)	Mean 14.7	(sd 6.6)

Knowledge regarding modes of prevention was assessed using a set of seven questions. Majority had correct knowledge regarding most modes except for the misconception that HIV/AIDS can be prevented by using mosquito nets and not sharing utensils. Regarding knowledge about testing and treatment of HIV/AIDS, although 80% knew that testing was available for HIV/AIDS, only half had satisfactory knowledge regarding treatment facilities. A sizeable proportion of participants answered 'don't know' for the question on availability of treatment for HIV/AIDS. Nearly 9% said that HIV/AIDS can be cured. (Table 2) The mean (SD) knowledge score was 14.7 (6.6). Almost 60% of participants did not have comprehensive HIV/AIDS knowledge. (Table 3)

Nearly half of the participants said that they would go to a private doctor to get an HIV test and around 15% said that they had not yet de-

cidated. Universally all of them said that they had no risk of having HIV/AIDS.

Table 4. HIV testing preferences and risk perception among of male migrant workers in selected factories of Faridabad

Variable	Nos.	%
Preference of health care provider for HIV testing		
Private Doctor	336	47.1
Govt. Doctor	272	38.1
Undecided	105	14.7
Had an HIV test		
Yes	80	11.2
No	633	88.8
Self-perception of risk for having HIV/AIDS		
None	699	98
Low	4	0.5
Don't know	10	1.5
Participant perceived 'type of people' who have higher risk of contracting HIV/AIDS (multiple response)		
Commercial sex workers	396	55.5
People having multiple sex partners	593	83.1
People having sex without condom	344	48.2
Others*	139	19.4

*Others - bad people, young people, dirty people, drivers, etc.

A little more than one tenth of the men had already been tested for HIV. Majority said that in

their perception 'people having multiple sex partners' had higher risk of contracting HIV/AIDS. (Table 4)

DISCUSSION

The study population was relatively younger and more literate because men like them were more likely to be employed in such factories. This age group was important from a programmatic standpoint because they are likely to be driven by a biological drive for sexual intercourse and experimentation, many among them are usually unmarried and many of them stayed away from home or spouse. All these factors combined with peer pressure, expendable cash and boredom could give them the state of mind, which predisposes them to involve in risky sexual behaviours.

Majority of the men had left their rural homes at a very young age when they were probably still experiencing and experimenting with sexual desire. Earlier migration indirectly indicates that these men had the propensity to undertake risky sexual behaviour earlier in life and for a longer duration. Majority had come from the state of Bihar, where scarce employment opportunities had led to the exodus of young men to industrial cities like Faridabad in search of better livelihood. It could also be due to factory policies that allow for preferred enrolment of persons from a particular state or it could have been due to the nature of contractors who brought these workers.

Majority (94%) of the participants had heard about HIV/AIDS. This was lower than that reported by the National Behavioural Surveillance Survey (BSS), 2006 (82%) among the labourer sub group and the National Family Health Survey - 3 (NFHS - 3) (84%) among general population.^{9,10} However, the results were comparable to the wide range reported (61 to 100%) by Halli SS et al¹¹ among a multi-sector workforce. Due to the continued IEC (Information, Education and Communication) efforts by both governmental and non-governmental agencies, this proportion might have increased over time and hence the higher proportion reported in this study as compared to the national surveys.

Although overall knowledge of the participants regarding routes of transmission and modes of prevention was satisfactory, some misconceptions were prevalent which may lead to stigmatisation of PLHA in such workplaces. Halli SS et

al¹¹ reported similar misconceptions such as spread of HIV through mosquito bite among a multi-sector workforce. This can be overcome by appropriate interpersonal communication and broader mass education. Similarly, Li L et al¹² reported that male migrants in construction and factory settings in China had poor knowledge of HIV transmission. In a series of studies¹³⁻¹⁶ conducted in collaboration with the Population Council in four states (Maharashtra, Andhra Pradesh, Karnataka and Tamilnadu) of India, HIV/AIDS knowledge was assessed among recent male migrants at residence or workplace. They reported wide variations in the knowledge level between states. For example proportion of men who said HIV spreads by having sex without condom ranged from 10 to 59% and proportion of men who said HIV/AIDS can be prevented by consistent condom use ranged from 2 to 60% among others. One of the important indicators for the knowledge component is the proportion of men who report that condoms reduce the risk of HIV. This proportion was rather high (92%) in our study which was comparable to that reported by Huy NV et al¹⁷ among male migrants in Vietnam. Increasing knowledge about transmission and prevention of HIV among high-risk groups is an important first step in empowering people from protecting themselves from the infection.

Regarding the Care, Support and Treatment (CST) aspects of HIV/AIDS these men had moderate knowledge. Almost 58% knew of a facility where they could get free HIV testing which was higher as compared to that reported (34%) by BSS - 2006⁹ among general population. In spite of widespread dissemination of messages on Integrated Counselling and Testing Centres (ICTC) and availability of such centres even at the sub-district level, many were unaware of such a facility. Lack of this knowledge may prevent exposed persons from seeking testing facilities for HIV and thereby preventing early detection. A large proportion of men were also unaware about free treatment facilities for HIV/AIDS. Lack of widespread availability of treatment centres (Anti-Retroviral Treatment centres) at present might be responsible for this finding. Almost 9% of men said that AIDS can be cured which was lower as compared to 46% reported by Huy NV et al¹⁷ and comparable to 10% reported by BSS - 2006. This is a worrisome finding and the possible reasons for this misconception may include false propaganda by quacks, native practitioners and television commercials that claim magic cure for

HIV/AIDS. This misconception is particularly dangerous because this may encourage involvement in risky behaviour with the false belief that if acquired, AIDS can be cured. This misconception can be removed by specific messages which state that AIDS is an incurable disease and by legally preventing claims of cure by unlicensed practitioners.

From the above discussion it can be generally stated that only a small proportion (40%) of participants had comprehensive knowledge regarding HIV/AIDS, which is rather discouraging. BSS - 2006 reported that 40% of general population participants in Haryana had comprehensive knowledge and NFHS - 3 reported that 31% in the 'away from home for more than one month' subgroup and about 29% in the 'production worker' subgroup had comprehensive knowledge. Saggurti N et al¹⁸ in a study among males with known HIV status in districts with high out-migration in Orissa, Bihar and Uttar Pradesh reported that comprehensive knowledge of HIV among migrants ranged between 22 and 53%. These results were comparable with our study. Since different studies formulate their own definition of comprehensive knowledge it is difficult to compare this indicator across studies. There is a huge knowledge gap in migrant workers that could be filled by tailoring IEC activities to their specific needs. Also, these men were more likely to be exposed to IEC messages in their urban workplaces rather than in their rural hometowns and hence likely to be more knowledgeable than their rural counterparts.

In this study, almost everybody reported that they had no risk of contracting HIV/AIDS as compared to only 70% reported by Li L et al (14). Also, Ijsselmuiden CB et al¹⁹ reported that 20% felt susceptible to AIDS and Saggurti N et al²⁰ reported that about 3% contract labourers perceived high/moderate risk for HIV. Most studies documented the lack of feeling of vulnerability among high-risk groups, which was comparable to the current study. Feeling vulnerable or at risk is one of the deterrents to risky sexual behaviour and its absence is likely to encourage risky behaviour. Although the participants did not report self-perceived vulnerability, majority believed that 'people having many sex partners' were at higher risk for contracting HIV/AIDS.

Another interesting finding in this study was that 11% of men had undergone HIV testing which was high as compared to 3.7% among general population and 3.4% among production

workers reported by NFHS - 3. This finding might be due to several reasons. The migratory nature of their work may prompt doctors to prescribe an HIV test. It may have been due to factories unofficially requiring an HIV test before recruitment or it may have been due to the provision of testing facilities within the factory itself by voluntary agencies. Many participants said that they would opt for private facilities for HIV testing which points to the fact that they were afraid of privacy being compromised in government facilities. It may also be due to their perceived low quality of care in government facilities. Therefore it is necessary to make ICTCs more accessible and user friendly. A mechanism to link a group of factories to a nearby-designated ICTC could be explored to enable those who would wish to get tested.

There were certain limitations in this study. Since we did a consecutive sampling and included only two selected factories the results have limited generalizability. It would be more desirable to have studied a wide range of factories. But most of the factories in Faridabad have a similar profile and the men employed there also have similar backgrounds. Hence, we assume that our results may be generalizable to other male migrant factory workers of Faridabad. A face-to-face interview was conducted by a single investigator, which was likely to capture more accurate information, although social desirability bias could not be ruled out.

In conclusion, the overall HIV/AIDS knowledge among male migrant factory workers was less than satisfactory. There is an urgent need to fill gaps in their knowledge, which may prove vital to prevent them from engaging in risky sexual behaviour. In addition to knowledge, several other factors that increase the vulnerability of migrants workers have been previously discussed.²¹⁻²⁴ This could prevent the spread of HIV/AIDS in the general population. A comprehensive HIV/AIDS prevention and control programme should be devised within the framework of factory settings by involving multiple stakeholders such as factory owners, associations of industries, worker associations, NGOs, local administrative bodies and local health department officials and the feasibility of such an intervention should be explored.

REFERENCES

1. UNAIDS. UNAIDS report on the global AIDS epidemic. Geneva; 2012.

2. National AIDS Control Organisation, Ministry of Health & Family Welfare, Government of India, National Institute of Medical Statistics, Indian Council of Medical Research. Technical report, India HIV estimates, 2010. India; 2010.
3. National AIDS Control Organisation, Ministry of Health & Family Welfare, Government of India. HIV sentinel surveillance 2010-11: a technical brief. New Delhi; 2012.
4. National AIDS Control Organisation, Ministry of Health and Family Welfare, Government of India. Targeted interventions for migrants: operational guidelines. New Delhi; 2007.
5. Afsar M. Enhancing business response to HIV/AIDS in India: operational guidelines with estimated cost analysis. New Delhi; 2005.
6. United Nations. The Declaration of Commitment on HIV/AIDS, United Nations General Assembly Resolution A/RES/S-62/2. New York; 2001.
7. Ministry of Labour and Employment, Government of India. National policy on HIV/AIDS and the world of work. New Delhi; 2009.
8. Bhattacharya M. Annual sentinel surveillance for HIV infection--issues and challenges. *Indian J Public Health*. 2007;51:22-7.
9. National AIDS Control Organisation, Ministry of Health & Family Welfare, Government of India. National Behavioural Surveillance Survey (BSS). General population. New Delhi; 2006.
10. International Institute for Population Sciences (IIPS) and Macro International. 2007. National Family Health Survey (NFHS-3), 2005-06: India: Volume I. Mumbai: IIPS.
11. Halli SS, Buzdugan R, Ramesh BM, Gurnani V, Sharma V, Moses S, et al. Assessing HIV risk in workplaces for prioritizing HIV preventive interventions in Karnataka State, India. *Sex Transm Dis*. 2009;36:556-63.
12. Li L, Morrow M, Kermode M. Vulnerable but feeling safe: HIV risk among male rural-to-urban migrant workers in Chengdu, China. *AIDS Care*. 2007;19:1288-95.
13. Annamalai University and Population Council. Migration/mobility and vulnerability to HIV among male migrant workers: Tamil Nadu. Chidambaram; 2008.
14. Karnataka Health Promotion Trust (KHPT) and Population Council. Migration/mobility and vulnerability to HIV among male migrant workers: Karnataka. Bangalore; 2008.
15. Population Council. Migration/mobility and vulnerability to HIV among male migrant workers: Andhra Pradesh. New Deilhi; 2008.
16. Tata Institute of Social Sciences (TISS) and Population Council. Migration/mobility and vulnerability to HIV among male migrant workers: Maharashtra. Mumbai; 2008.
17. Huy NV, Dunne MP, Debattista J, Hien NT, Dao Thi Minh An. Association of Human Immunodeficiency Virus (HIV) preventive information, motivation, self-efficacy and depression with sexual risk behaviors among male freelance laborers. *J AIDS and HIV Research*. 2011;3:20-9.
18. Saggurti N, Mahapatra B, Swain SN, Battala M, Chawla U, Narang A. Migration and HIV in India: study of select districts. UNDP, NACO, and Population Council. New Delhi; 2011.
19. Ijsselmuiden CB, Padayachee GN, Mashaba W, Martiny O, van Staden HP. Knowledge, beliefs and practices among black goldminers relating to the transmission of human immunodeficiency virus and other sexually transmitted diseases. *S Afr Med J*. 1990;78:520-3.
20. Saggurti N, Verma RK, Jain A, RamaRao S, Kumar KA, Subbiah A, et al. HIV risk behaviours among contracted and non-contracted male migrant workers in India: potential role of labour contractors and contractual systems in HIV prevention. *AIDS*. 2008;22:S127-136.
21. Rizwan SA, Goswami K, Rai SK, Misra P, Kant S. HIV-Risk Behavior Among the Male Migrant Factory Workers in a North Indian City. *Indian J Community Med*. 2015;40(2):108-15.
22. Rizwan SA, Kant S, Rai SK, Goswami K, Misra P. Prevalence and determinants of sexually transmitted infections (STIs) among male migrant factory workers in Haryana, North India. *Indian J Public Health*. 2015;59(1):30-6.
23. Rizwan SA, Kant S, Goswami K, Rai SK, Misra P. Influence of alcohol on condom use pattern during non-spousal sexual encounter in male migrant workers in north India. *J Postgrad Med*. 2014;60(3):276-81.
24. Rizwan SA, Kant S, Goswami K, Rai SK, Misra P. Correlates of Intention to Use Condom among Male Migrant Factory Workers in Northern India. *J Clin Diagn Res*. 2014;8(8):JC05-8.

Box 1. Variables included for the calculation of knowledge score

1. Heard of HIV/AIDS
 - Knowledge about routes of transmission**
 2. Mosquito bite
 3. Having sex without condom
 4. Kissing on cheeks
 5. By hugging a person
 6. Mother to her child
 7. Through breast feeding
 8. Using public toilet
 9. Through infected blood
 10. Sharing used needles
 - Knowledge about modes of prevention**
 11. Regular condom use
 12. Using mosquito nets
 13. Not sharing utensils
 14. Having sex with one uninfected faithful partner
 15. Not having sex with commercial sex worker
 16. Not sharing needles
 17. Avoiding blood contact
 - Knowledge about Care, Support and Treatment**
 18. Any test to detect HIV/AIDS
 19. Any place where free testing for HIV/AIDS is provided
 20. Drugs available for treatment of HIV/AIDS
 21. Any place where free treatment for HIV/AIDS is provided
 22. Cure for HIV/AIDS
-