

Descriptive Study of Hepatitis B, C and HIV Infections and Associated Factors among Adult Population in Kabul City, 2015

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ABSTRACT: -Background: Viral infections are global public health problem. Shortage of information about Hepatitis B Virus (HBV), Hepatitis C Virus (HCV) and HIV/AIDS prevalence in Afghanistan is very clear. This study aimed to describe the prevalence and risk factors associated with HBV, HCV and HIV infection among adult population of Kabul city.

Methods and Materials: A province based cross-sectional survey among adult population (25-70 years) of Kabul city was conducted in November, 2015 using a WHO STEP wise tool. A total of 1174 adult citizens in Kabul city were included in the study. Demographic, socioeconomic and lifestyle factors were collected by face to face questionnaire. Blood samples were collected and rapid tests were used to find the prevalence of HBV, HCV, and HIV infections. Data management was done using Epi info v.7 and SPSS v.20.

Results: The overall prevalence of HBV using HBsAg and Anti-HCV rapid tests were 3 % (35/1174) and 1.1% (13/1374) respectively. Only two individuals were positive for HIV infection out 100 samples under confirmatory test. Of total 1174 records females constituted almost half 599 (51%) with overall mean age of 38.6±12.2 years. Females were slightly more in all age groups. Approximately half of the respondents (49.6%) were illiterates while the proportion of illiteracy was more in all age groups. Two third of the study subjects were married (77.5%) and 60% of women were housewives. Risky behaviors such as tattooing, hospitalizations, history of jaundice, living with hepatitis patients and undergoing dental procedures were common among positive subjects.

Conclusion: A prevalence rate of 3%, 1.1% for HBsAg and anti-HCV and two cases of HIV infection apparently represents a trigger point for action in Kabul city. Public awareness and health education regarding risk factors for viral hepatitis and encouragement for vaccination is recommended. National program for blood borne viral diseases are an axis for focus of government and donors.

Keywords: HBV, HCV, HIV infection, Hepatitis, risk factors, Kabul, Afghanistan

I. INTRODUCTION

Hepatitis B and C viral infections are recognized as global health problems that are transmitted through contact with the blood or other body fluids. They attack the liver causing both acute and chronic disease. Viral hepatitis affects 400 million people globally and 6–10 million people are newly infected each year. Globally, about 1.4 million people die each year from hepatitis. An estimated 240 million people are chronically infected with hepatitis B while more than 650,000 people die annually due to its complications including cirrhosis and liver cancer. Besides Hepatitis B is an important occupational hazard for health workers. However, it can be prevented by currently available safe and effective vaccine [1]. The WHO strategy on viral hepatitis addresses the axes such as awareness-raising, partnerships and resource mobilization; evidence-based policy and data for action; prevention of transmission and screening, care and treatment [2].

The hepatitis C virus is a blood borne virus transmitted through unsafe injection practices, inadequate sterilization of medical equipment, and the transfusion of unscreened blood and blood products. Globally, around 150 million people have chronic hepatitis C infection and a significant number of those who are chronically infected will develop liver cirrhosis or liver cancer. Approximately 700 000 people die each year from hepatitis C-related liver diseases. Antiviral medicines can cure approximately 90% of persons with hepatitis C infection, thereby reducing the risk of death from liver cancer and cirrhosis, but access to diagnosis and treatment is low [3]. Most of the patients with HCV are asymptomatic till the disease is at its terminal stage posing a great danger to spread this infection silently [4]. There is currently no vaccine available for HCV infection prevention due to the high degree of strain variation but the struggles are ongoing [5].

Human Immunodeficiency Virus (HIV) continues to be a major global public health issue. In 2015 around one million people died from HIV-related causes globally. There were approximately 36.7 million people living with HIV at the end of 2015 with 2.1 million people becoming newly infected globally. Sub-Saharan Africa is the most affected region, with 25.6 million people living with HIV in 2015. HIV infection is often diagnosed through rapid diagnostic tests (RDTs), which detect the presence or absence of HIV antibodies

and provide same-day test results. There is no cure for HIV infection. However, effective antiretroviral (ARV) drugs can control the virus and help prevent transmission so that people with HIV, and those at substantial risk, can enjoy healthy, long and productive lives. Between 2000 and 2015, new HIV infections fell by 35%, AIDS-related deaths fell by 28% with some 8 million lives saved. This achievement was the result of great efforts by national HIV programs supported by civil society and a range of development partners. Expanding ART to all people living with HIV and expanding prevention choices can help avert 21 million AIDS-related deaths and 28 million new infections by 2030 [6].

There are variations in prevalence of HBV around the globe. In a study which was conducted in Iran the overall prevalence of HBV was 3% and its distribution varied in different provinces from 0.87% to 8.86% [7]. In Brazil the prevalence of HBV in elderly was 0.6% with positive HBsAg and 15.1% with anti-HBc reactive. Variables remained independently associated with HBV infection were male gender, marital status, ≤ 4 years of schooling and acupuncture [8]. A cross sectional study in Nigeria among university students reported that the seroprevalence of HBsAg was 8.3% out of which 26.7% were positive for HBeAg, 53.3% had HBeAb, 20% had neither HBeAg nor HBeAb, 100% had total HBcAb and 86.7% had HBV DNA in their serum [9]. A nationwide survey in Romania showed that the overall prevalence rate of HBV chronic infection was 4.4%. The personal history of blood or blood product transfusion, surgical interventions, tattooing, and alcohol consumption greater than 60 g/day were risk factors associated with HBV [10].

Furthermore there are similar variations on facts and rates of Hepatitis C virus. For instance the highest chronic infection rate of Hepatitis C was reported in Egypt (22%), Pakistan (4.8%) and China (3.2%) [1]. Risk factors for HCV is not properly known by community in Pakistan. For example in a study conducted in Pakistan majority of HCV positive respondents had misperceptions of water, food, heat, and mosquitoes as the major factors of HCV transmission. While history of therapeutic injections/year, surgery, shaving at barber's shop, sharing tooth brush, razor and *maswak*, was more in HCV positive respondents [11]. In a study in Morocco the HCV and HBV-seropositivity was documented in 1.58% and 1.81% of participants respectively from the general population. Two patients were found to be co-infected. Gender was not associated with HCV but risk factors for acquiring HCV infection were identified; age, dental treatment, use of glass syringes and surgical history. In addition to these factors, gender and sexual risk behaviors were found to be associated with higher prevalence of hepatitis B [12].

Very few studies conducted on blood born viral diseases including HBV, HCV and HIV infection due to other competing priorities. A review study reported that the prevalence was 1.9% for HBV and 1.1% for HCV in all Afghanistan population. Most at risk population to hepatitis include injecting drug users and female sex workers, while truck drivers, prisoners and homosexual men needs attention. This review was based on analysis of the limited available data in Afghanistan [13]. According to a meta-analysis prevalence of HCV in Afghanistan estimated at 0.7% among the general population and 31.8% among people who inject drugs (PWID) and 2.5% among populations at intermediate risk. The prevalence of HCV among PWID appeared to decline over few years from 36.0% to 27.6% in Kabul, from 12.5% to 9.5% in Jalalabad, and from 24.1% to 18.8% in Mazar-e-Sharif, it increased from 49.1% to 70% in Herat. Among prisoners, HCV prevalence appeared to increase from 1.7% to 4.6% in Kabul and declined from 4.1% to 1.4% in Herat. Risk factors among PWID included a range of injecting behaviors and socio-demographic characteristics. It means that HCV prevalence among the general population in Afghanistan is comparable to developing and developed countries globally [14]. Higher prevalence of hepatitis viruses has been reported among Afghan refugee populations outside of Afghanistan may raise the concern of elevated prevalence of hepatitis within the country [15]. In a study a total of 2166 Afghan national were included in the study who underwent surgery in a hospital in Peshawar Pakistan, 104 patients (4.8%) were found to be positive for HBV. Re-use of unsterilized syringes and history of previous surgery were the most common risk [16]. In a real-time PCR assay with a set of primers and probe amplified core protein region of HBV genome the HBV DNA was detected in 79.7 % of serum samples. The comparison of viral loads between the age groups and sex indicated no significant correlation, however, the serum HBV DNA level significantly decreased in the treated patient group [17]. In another study of female sex workers the prevalence of HIV was 0.19%, HCV was 1.92%, and HBV was 6.54. HBV was associated age, ever using alcohol, anal sex and having children [18]. In a cross-sectional sample of adult injection drug users (IDUs) in Kabul, Afghanistan it was reported that the overall prevalence of HIV, HCV, and HBsAg were 3.0%, 36.6% and 6.5% respectively. Among male IDUs risky behavior, including sharing syringes, paying women for sex and having sex with men or boys were common [19]. Viral hepatitis has been a significant health risk for outsiders including US coalition, peacekeepers, and humanitarian workers deployed to Afghanistan. Viral hepatitis was a serious problem for Russian troops during the Soviet Union's incursion into Afghanistan in the 1980s [20]. A cross-sectional survey of hepatitis B surface antigen (HBsAg) was conducted during October 2003 reported that blood specimens of 8.3% were positive for HBsAg. Out of 301 children, 17 (5.6%) were positive for HBsAg [12]. In a cross sectional study of adult participants undergoing treatment for tuberculosis 0.2% were HIV-infected [21]. A study on children in which a total of 330 children from outpatients clinics were included

showed that the frequency of positive results for HBsAg, anti-HBs and anti-HCV in all age groups were 12 (3.6%), 47 (14.2%) and 2 (0.6%), respectively. Anti-HIV was not detected in any of the children's serum [22]. A study in Jalalabad city among adult citizens reported that only 45 participants out of 1200 (3.8%) were seropositive for HBsAg on rapid test and 41 (3.4%) were confirmed positive after ELIZA test. Totally 11 subjects (0.9%) were seropositive for anti-HCV on rapid tests. Both infections coexisted in none of participants and no one was positive for HIV infection. By multivariate logistic regression analysis, independent predictors for HBsAg infection were being male, traditional practice of tattooing and history of jaundice [23]. Another study in Mazar-e-Sharif reported that the prevalence of HBV was 5.6% (69 out of 1231) for HBsAg on rapid test and 67 (5.4%) were confirmed positive after ELIZA test. Totally 3 subject (0.2%) were seropositive for anti-HCV on rapid tests. By multivariate logistic regression analysis, independent predictors for HBsAg infection were sex, history of jaundice, blood transfusion and living with hepatitis patients [24]. Due to years of war and conflict in Afghanistan few studies conducted on infectious as well as noncommunicable diseases. The main objective of this article is to describe the prevalence of HBV, HCV and HIV infections and risky behaviors among adult citizens in Kabul city.

I. METHODS AND MATERIALS

Using WHO STEP wise tool a cross-sectional study was conducted in November to identify the main risk factors for noncommunicable disease among Kabul citizens. The tool consists of three steps such as measuring socioeconomic and behavioral risk factors, physical measurements, and measuring biological risk factors [25]. Taking this opportunity the questionnaire were revised the variables commonly associated with blood borne diseases such as HBV, HCV and HIV infection were included in the questionnaire and blood samples collected and tested both for biochemical factors and mentioned viral infections by using rapid tests. For this study a general approval was given by the institutional review board (IRB) of the Ministry of Public Health and informed consent was taken from each individual before the interview. The results of physical and biochemical measurements communicated to required participants and the confidentiality of the information gathered was maintained.

Adult individuals of 25-70 years were included in the study. Assuming the highest prevalence (50%), 95% confidence interval (CI) and margin of error of 5%, a sample size of 385 subjects was calculated to include in the study. However, considering the proportion of other risk factors and design effect of 2 the final sample size was 1200. The 2015 Expanded Programme for Immunization (EPI) list of clusters was used as the sampling technique. We used multistage cluster sampling; in the first stage, from the list we conventionally selected five districts using random number in excel sheet. In the second stage from each selected district we randomly selected the 2 cluster; later the overall sample of 1200 household distributed among these selected area according to the proportion to the size of household number in each districts/ areas. Finally, the number of households in each area divided by the sample size assigned for each areas, it was enable us to select household systematically. The adapted questionnaire used by interviewers which covered information on demographic, behavioral and physical measurements. A household was defined as a group of people who share the same food pot (not the same roof). Blood samples were collected after filling the questionnaire by another experienced health worker the next morning and were transported in cold boxes (2-8°C) from field to Central Public Health Laboratory (CPHL) in Kabul. On arrival in CPHL all serum samples were stored at -80°C and later on were tested biochemical markers and tested for HBV, HCV, HIV infection using rapid tests. Data management and analysis was done using Epi-info, version 7 and SPSS, version 20.

II. RESULTS

This study describes the prevalence of blood borne infections such HBV, HCV and HIV infections in Kabul urban adults' population. It also describes and factors involved in transmission of such infections. Of total 1174 records females constituted almost half 599 (51%) with overall mean age of 38.6±12.2 years. Females were slightly more in all age groups. Three-fourth (75%) of the study participants were aged less than 45 years. Approximately half of the respondents (49.6%) were illiterates while the proportion of illiteracy was more in all age groups. Two third of the study subjects were married (77.5%) and 60% of women were housewives (Table 1).

The prevalence of HBV was 3% (35 out of 1174) for HBsAg on rapid test. Totally 13 subject (1.1%) were seropositive for anti-HCV on rapid tests. All samples were tested for HIV infection using rapid tests and none were positive. Furthermore 100 serums including all HBV and HCV positives (rest of them negatives) were sent for further testing to Ankara, Turkey. As a result of serological testing for HIV Ag/Ab two individuals were positive for HIV infection. So we can claim that the prevalence of HIV infection is 2% (2/100) among adult population in Kabul city. In addition there was only one person with co-infection of HBV and HCV. Use of tobacco was measured asking cigarette smoking and mouth snuff using. Eight percent of the study participants were current smokers and about half of them had smoking duration of 10 years. However smoking

proportions differed from 5 to 9% among age groups highest in younger ones. Similarly, the general prevalence of snuff use was (9.8%) predominantly among males while it was diluted due to low prevalence of snuff use in females (2%). Sixty-six percent knew hepatitis. Table 2 reflects information on risk factors contributing in transmission of blood borne viral infections. In last six month ahead of field data collection 4.5% had blood transfusion; 2.3% had undergone surgery procedures and 18.1% undergone dental procedures. History of having jaundice was prevalent in 2.6% while one third (34%) of them taken injection in last six months. Some behaviors such as piercing and traditional tattooing was reported in 31.7% mostly in females and 1.9% of study subjects respectively. Almost 2.4% went to hospitals in last six months and 10.7% had lived with a person who had hepatitis. Coverage of vaccination for hepatitis B was 6.2%. Almost one third of participants (30.6%) went to simple barber shops while the other two thirds were using modern barber shop or not using it being females. Proportion of blood transfusion ranged from 4% to 7% among age groups with highest among 45-55 years. Surgery procedures ranged from 1% to 6% among age groups with highest among older age groups. The rest of variables are explained with differentiation of age groups in frequency table.

Table 3 explains the prevalence of HBV and HCV by age categories among groups having various risky behaviors. Due to low number of positive cases it is difficult to identify statistical difference among groups. Prevalence of HBV was highest in young age groups (25-35) years while the prevalence of HCV was highest among highest age groups. However this difference was not statistically significant. Hepatitis B were more prevalent in males 23/35 (66%) as compare to females 12/35 (34%). Hepatitis C prevalence was high in females 9/13(69%) and low in females 4/13(31%). The prevalence of HBV was equaling in level of education while HCV was more prevalent in illiterates 8.13(62%). Almost two third of study subjects among positives and negatives in HBV and HCV had knowledge of viral hepatitis. Practice of blood transfusion was equal 5% and 6% among positive and negative cases of HBV while none of HCV positive cases had any practice of blood transfusion. Undergoing surgery procedures were similar in all groups but the practice of undergoing dental procedures were more in positive as compare to negative in both HBV (18% vs 24%) and HCV (18% vs 23%). The proportion of having history of jaundice was 18% in cases of HBV as compare to 2% in negative samples. HCV positives did not have any history of jaundice. Almost 33% of HBV negatives practiced piercing and 10% of HBV positive practice piercing. The same finding is found for HCV as well. This is a controversial findings and require more in-depth and further studies. Practice of tattooing was not different in HBV positive or negatives but it was much different among HCV positive (8%) and negatives (2%). Hospitalization was more common among HBV positives (9%) as compare to negatives (2%) but no data was available for HCV. We did not have data on having lived under one roof with HCV patients but it was in double in HBV positives (21%) as compare to negative cases of HBV (10%). Just 6% of patients said they have been vaccinated against HBV while due to poor knowledge of HCV virus few subjects reported being vaccinated against HCV as well.

III. DISCUSSION

There is very few information available in Afghanistan on both communicable and noncommunicable diseases. The prevalence of and HBsAgseropositivityHBc antibody in the current study was 3% and1.1%, respectively. These values are similar to those reported in other provincial research papers reported from Jalalabad and Mazar-e-Sharif [13, 23-24]. The prevalence of the HCV antibody was high in men, older subjects, and illiterates. Furthermore two case of HIV infection tested positive in Ankara Turkey is main concern. The overall prevalence of HIV/AIDS infection in general population is reported to be <0.5%. Therefore, finding of this study although few cases could trigger the point that it is four-fold of general population and more focus should be given for further advanced studies in this regards. Such findings were zero in Jalalabad as well as Mazar studies apparently[23-24]. Probably that would be due to validity of rapid test which will require more confirmatory tests. Identification of such prevalence in adult population is first of its kind in this city but still due to lack of data from large parts of county efforts are required to strengthen national surveillance supported by lab components to assess the exact situation of viral hepatitis. The level of prevalence of all HBV, HCV and HIV infection seems low but having more proportion of high risk groups it could be projected to increase due to poor health education, low literacy level and weak health system. There is just national control program of tuberculosis, HIV/AIDS and malaria. There is a need to have a national control program for all kinds of hepatitis supported by government and donors. Findings reflected young generation were more positive for HBV and that could be due to involvement of this group in using of injections drugs which is a key driver of blood born viral transmission and probably owing to sharing the needles [26]. Undergoing dental procedures, tattooing and hospitalization were more common among HBV positives. These are known risk factors for such blood borne viral diseases and have been reported elsewhere as well [27]. Past history of jaundice was also prevalent in positive cases versus negative cases. Probably it could be a reason for their early exposure for virus which is not diagnosed timely. These findings are reported in literature by other studies as well [28].Despite of having shown the first time prevalence of blood born infection including HBV, HCV and HIV infection among general adult population in Kabul city, there were some limitations as well. The study was not designed initially for purpose

of this study and confirmatory tests were not available in the country to approve the rapid tests. Although the burden seems low but due to low public awareness, risky behaviors, weak health system with tens other priorities more attention is needed to be given to this problem. A combine national program for prevention and control of viral blood born infections are recommended and widespread and national vaccination against HBV is encouraged particularly health workers should be prioritized. The national policy for health [29] and national health strategy [30] are developed recently in Ministry of Public Health in which attention is given to communicable disease including HBV, HCV and HIV/AIDS infection, however, the departments, programs, planners and donors should design some informed and practical strategies regarding these critical viral diseases to be tailored with local problems.

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Table 1: Demographic characteristics and behaviors of the study participants, Kabul city

Variables	Categories	25-34 years		35-44 years		45-54 years		55+ years	
		N	%	N	%	N	%	N	%
Sex									
	Female	301	51%	158	55%	89	54%	51	51%
	Male	291	49%	131	45%	76	46%	75	49%
	Total	592	100%	289	100%	165	100%	126	100%
Level of Education									
	Illiterate	257	45%	154	57%	82	52%	82	68%
	Primary and unofficial	96	17%	55	20%	34	22%	17	14%
	Secondary school	139	24%	43	16%	31	20%	13	11%
	High school and over	78	14%	20	7%	11	7%	9	7%
	Total	570	100%	272	100%	158	100%	121	100%
Job Categories									
	Official Employees	98	17%	43	15%	22	13%	173	8%
	Students	17	3%	0	0%	0	0%	17	0%
	Private Business	25	4%	12	4%	10	6%	55	6%
	Worker/Farmer	35	6%	25	9%	8	5%	77	7%
	Jobless	28	5%	17	6%	7	4%	61	7%
	Housework	187	32%	108	38%	51	31%	368	18%
	Unable to work/no response	200	34%	82	29%	66	40%	415	54%
	Total	590	100%	287	100%	164	100%	1166	100%

Cigarette Smoking									
	No	538	91%	263	91%	154	93%	120	95%
	Yes	52	9%	26	9%	11	7%	6	5%
	Total	590	100%	289	100%	165	100%	126	100%
Marital Status									
	Single	127	22%	8	3%	0	0%	1	1%
	Married	415	71%	247	87%	140	86%	95	75%
	Widow/Widower	2	0%	10	4%	19	12%	23	18%
	Divorced	0	0%	1	0%	2	1%	3	2%
	Refused	43	7%	17	6%	1	1%	4	3%
	Total	587	100%	283	100%	162	100%	126	100%
Mouth Snuff Users									
	No	555	95%	256	89%	145	88%	96	76%
	Yes	32	6%	32	11%	20	12%	30	24%
	Total	587	100%	288	100%	165	100%	126	100%
Knowledge of Hepatitis									
	No	172	29%	98	34%	67	41%	52	41%
	Yes	418	71%	190	66%	98	59%	74	59%
	Total	590	100%	288	100%	165	100%	126	100%

Table 2: Frequency distribution of behavioral characteristics of study participants in Kabul city by age groups

Variables	Categories	25-34 years		35-44 years		45-54 years		55+ years	
		N	%	N	%	N	%	N	%
Blood Transfusion									
	No	568	96%	270	95%	154	93%	121	96%
	Yes	22	4%	15	5%	11	7%	5	4%
	Total	590	100%	285	100%	165	100%	126	100%
Surgery Procedure									
	No	584	99%	279	97%	160	97%	119	94%
	Yes	6	1%	9	3%	5	3%	7	6%
	Total	590	100%	288	100%	165	100%	126	100%
Dental Procedure									
	No	488	83%	221	77%	139	84%	109	87%
	Yes	102	17%	67	23%	26	16%	17	14%
	Total	590	100%	288	100%	165	100%	126	100%
History of Jaundice									
	No	575	98%	280	97%	160	97%	122	97%
	Yes	13	2%	8	3%	5	3%	4	3%
	Total	588	100%	288	100%	165	100%	126	100%
Needle Injection									
	No	412	70%	183	64%	102	62%	73	58%
	Yes	178	30%	105	37%	63	38%	53	42%
	Total	590	100%	288	100%	165	100%	126	100%
Piercing									
	No	400	68%	188	66%	110	67%	94	75%
	Yes	189	32%	98	34%	54	33%	31	25%
	Total	589	100%	286	100%	164	100%	125	100%
Tattooing									
	No	574	98%	282	98%	163	99%	125	100%
	Yes	14	2%	6	2%	2	1%	0	0%

	Total	588	100%	288	100%	165	100%	125	100%
Hospital visit									
	No	582	99%	283	98%	158	96%	118	94%
	Yes	9	2%	5	2%	7	4%	7	6%
	Total	591	100%	288	100%	165	100%	125	100%
Living with Hepatitis Patients									
	No	515	88%	257	90%	150	91%	117	94%
	Yes	73	12%	28	10%	15	9%	8	6%
	Total	588	100%	285	100%	165	100%	125	100%
Vaccination Status									
	No	551	94%	267	94%	151	94%	115	92%
	Yes	35	6%	18	6%	10	6%	10	8%
	Total	586	100%	285	100%	161	100%	125	100%

Table 3: Hepatitis B virus infection status by socio-demographic factors in study participants in Kabul city

Variables	Groups	HBV Negative		HBV Positive		HCV Negative		HCV positive	
		N	%	N	%	N	%	N	%
Age in years									
	25 - 34	578	51%	15	43%	590	51%	3	23%
	35 - 44	280	25%	9	26%	285	25%	4	31%
	45 - 54	159	14%	6	17%	163	14%	2	15%
	54 and over	122	11%	5	14%	123	11%	4	31%
Sex									
	Female	587	52%	12	34%	595	51%	4	31%
	Male	552	49%	23	66%	566	49%	9	69%
Level of education									
	Illiterate	558	51%	17	53%	567	51%	8	62%
	Literate	531	49%	15	47%	541	49%	5	39%
Knowledge of Hepatitis									
	No	377	33%	12	36%	384	33%	5	39%
	Yes	759	67%	21	64%	772	67%	8	62%
Blood Transfusion									
	No	1082	96%	31	94%	1100	95%	13	100%
	Yes	51	5%	2	6%	53	5%	0	0%
Surgery Procedure									
	No	1110	98%	32	97%	1129	98%	13	100%
	Yes	26	2%	1	3%	27	2%	0	0%
Dental Procedure									
	No	932	82%	25	76%	947	82%	10	77%
	Yes	204	18%	8	24%	209	18%	3	23%
History of Jaundice									
	No	1110	98%	27	82%	1124	97%	13	100%
	Yes	24	2%	6	18%	30	3%	0	0%
Needle Injection									
	No	745	66%	25	76%	759	66%	11	85%
	Yes	391	34%	8	24%	397	34%	2	15%
Piercing									
	No	764	67%	28	90%	780	68%	12	92%
	Yes	369	33%	3	10%	371	32%	1	8%
Tattooing									
	No	1112	98%	32	97%	1132	98%	12	92%

	Yes	21	2%	1	3%	21	2%	1	8%
Hospitalization									
	No	1111	98%	30	91%	1128	98%	13	100%
	Yes	25	2%	3	9%	28	2%	0	0%
Living with Hepatitis Patients									
	No	1013	90%	26	79%	1026	89%	13	100%
	Yes	117	10%	7	21%	124	11%	0	0%