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Research Article

**ASSESSMENT OF KNOWLEDGE OF STUDENTS AT PUNJAB  
UNIVERSITY CAMPUS GUJRANWALA REGARDING  
FACTORS CONTRIBUTING FOR HEPATITIS C****Dr. Muhammad Shahid Hussain, Dr. Usman Hussain, Dr. Sameer Ahmed**  
DHQ Teaching Hospital Gujranwala**Abstract:**

Hepatitis C Virus (HCV) is affecting 170 million people annually (WHO, 2012) and Pakistan ranks high in chronic hepatitis. HCV is a leading cause of chronic liver disease and hepatocellular carcinoma rapidly transmitting as silent killer. Our objectives were to assess the knowledge of students of Punjab University (Gujranwala Campus) about contributing risk factors for HCV infection. And to impart knowledge to students regarding preventive measures in relation to associated risk factors for HCV transmission. Subjects were 100 students our study was Descriptive / cross sectional study. The following data collection tools were developed and used. A consent form was used to get the consent of the respondents wherever possible. A semi structured Questionnaire was used to get information from study population. The tools were pretested and modified according to requirements. In our study the overall questionnaire response was 100 %.

**Objectives:** To assess the knowledge of students of Punjab University (Gujranwala Campus) about contributing risk factors for HCV infection. To impart knowledge to students regarding preventive measures in relation to associated risk factors for HCV transmission.

**Result and Conclusion:** 35% responded that sexual contact was possible mode of transmission of HCV infection followed by 20% and 19% who believed that organ transplant and blood transfusion were the main modes of transmission of virus. 13 % answered that sharing of tooth brushes and razors were main causes of its transmission. Another 13% responded that use of injections was the source of transmission of HCV. 80% believed that infection was transmittable from mother to child. 47% think recipient of blood and blood products are at the risk of developing HCV infection. 23 % thought that people with multiple sex partners were at the risk of developing HCV infection. 70% were of opinion that Vaccination was available against HCV infection and only 28% knew that it was not available. 77% believed that spread of HCV infection could be prevented by avoiding blood contacts. 10% said that prevention was possible by avoiding eating together, 5% said by avoiding hand shake and 8% said that it prevention is not possible.

92 % believed that the treatment of HCV infection was available. 8% said there is no treatment of this infection. 77 % said that recurrence of HCV infection was possible and 7 % responded with no. 17 % said that they did not know about this. Summarizing the results of this study, these findings indicate an ambivalent knowledge about HCV infection amongst Punjab University Gujranwala students, many gaps were observed, suggesting the importance of continuous education about HCV in this population to prevent HCV infection as well as discrimination and prejudice towards patients with hepatitis C.

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**INTRODUCTION:**

The term 'Hepatitis' refers to inflammation of the liver. Inflammation is the local reaction of the body, in this case the liver, in response to a damaging agent. It leads to accumulation of inflammatory cells, swelling of tissue and cells and eventually the death of cells. In case of chronic hepatitis, a compensatory response of the body may include the formation of scar tissue (fibrosis) and remodeling of the liver into nodules. The latter condition is called cirrhosis. A number of different agents can cause hepatitis, including infective agents (virus, bacteria, other organisms), chemical poisons, drugs and alcohol or an immune response towards the organ itself (autoimmune hepatitis). Viral hepatitis refers to a set of at least 5 viruses that are known to cause hepatitis: hepatitis A (HAV), hepatitis B (HBV), hepatitis C (HCV), hepatitis D (HDV), and hepatitis E (HEV). It is widely assumed that there are other, as yet unidentified, hepatitis viruses. The most common types of viral hepatitis are hepatitis A, B, and hepatitis C and in some parts of the world hepatitis E. Both hepatitis B and C can lead to serious, permanent liver damage, and sometimes acute liver failure and death. Chronic persistence of the virus is a major cause of cirrhosis and death, as well as liver failure or liver cell cancer [1].

There are two primary modes of transmission of viral hepatitis: Water-food-borne and Blood-born. In the former case hepatitis A or E are implied which are spread through contaminated food and water. By contrast, blood born viral hepatitis, cause by the hepatitis B, C or D virus and may lead to long-term, persistent infections and chronic liver disease with potentially lethal consequences. Hepatitis C is an infectious disease caused by the hepatitis C virus (HCV) that primarily affects the liver. The virus persists in the liver in about 75% to 85% of those initially infected. Early on chronic infection typically has no symptoms. Over many years however, it often leads to liver disease and occasionally cirrhosis. [2] In some cases, those with cirrhosis will develop complications such as liver failure, liver cancer, or esophageal and gastric varices. HCV is spread primarily by blood-to-blood contact associated with intravenous drug use, poorly sterilized medical equipment, needle stick injuries in healthcare, and transfusions. [2] [3] With blood screening the risk from a transfusion is less than one per two million. It may also be spread from an infected mother to her baby during birth. About 200 million people are infected with HCV worldwide, which covers about 3.3% of the world's population [1,2]. HCV infection leads to chronic hepatitis in 50% to 80% of individuals [3]. It was estimated by the WHO in 2004

that the annual deaths due to liver cancer caused by HCV and cirrhosis were 308 000 and 785 000 respectively [4]. In developing countries, due to non-implementation of international standards regarding blood transfusion, reuse of needles for ear and nose piercing, reuse of syringes, injecting drug users, tattooing, shaving from barbers, unsterilized dental and surgical instruments are the main source of transmission of HCV. In Pakistan 10 million people are presumed to be infected with HCV [5]. Public health authorities are creating awareness about hepatitis through print and electronic media, but still tremendous efforts are required to increase the awareness regarding various risk factors involved in HCV transmission. Pakistan ranks high in chronic hepatitis mortality and according to Pakistan Medical Research Council (PMRC) hepatitis survey report (2009) the prevalence of HCV in general population is 5%. [6].

A study conducted in Pakistan's Sindh province reported that people's lack of awareness of risks associated with injections and their strong belief in the quick action of injection for disease treatment was the cause of injections overuse. These factors are supplemented by general practitioners and unqualified providers inclinations to prescribe more injections. [7]

**LITERATURE REVIEW**

Hepatitis C virus (HCV) was discovered in 1989 as the major causative agent of non-A, non-B hepatitis. It belongs to the Flaviviridae family (Genus Flavivirus) and is a plus-stranded RNA virus [8]. About 200 million people are infected with HCV worldwide, which covers about 3.3% of the world's population [6]. HCV infection leads to chronic hepatitis in 50% to 80% of individuals. It was estimated by the WHO in 2004 that the annual deaths due to liver cancer caused by HCV and cirrhosis were 308 000 and 785 000 respectively [9]. HCV occurs among persons of all ages, races, and genders. The highest incidence of acute infection is among those aged 20 –39, with males predominating. African Americans and whites have similar rates, and the rate for Hispanics is slightly higher. The highest prevalence rates are found in males aged 30 – 49, with African Americans having a higher prevalence than whites. Hepatitis C virus (HCV) is a globally prevalent pathogen and a leading cause of death and morbidity [13]. The most recent estimates of disease burden show an increase in seroprevalence over the last 15 years to 2.8%, equating to >185 million infections worldwide [14]. Persistent HCV infection is associated with the development of liver cirrhosis, hepatocellular cancer, liver failure, and death

[15], and HCV is now the most common cause of death in HIV-positive patients on highly active antiretroviral therapy [16], While the incidence rate of HCV infection is apparently decreasing in the developed world, deaths from liver disease secondary to HCV infection will continue to increase over the next 20 years. [17]

#### **Situation in World:**

Hepatitis C Virus (HCV) infection is now being recognized as a global health problem. Around 170 million people are chronically infected and 3 – 4 million are newly affected every year. [18] Most of the patients are asymptomatic till the disease is at its terminal stage posing a great danger to spread this infection silently. [19] There is currently no vaccine available for HCV infection prevention due to the high degree of strain variation. [20] The highest chronic infection rate of Hepatitis C in Egypt (22%), Pakistan (4.8%) and China (3.2%). Pakistan ranks high in chronic hepatitis mortality and according to Pakistan Medical Research Council (PMRC) hepatitis survey report (2009) the prevalence of HCV in general population is 5%. [ 11,12].

#### **Situation in Pakistan:**

Pakistan is a developing country of 170 million people with low health and educational standards. According to the human development index of the United Nations, it was ranked 134th out 174 countries. In Pakistan 10 million people are presumed to be infected with HCV [21]. Public health authorities are creating awareness about hepatitis through print and electronic media [22], but still tremendous efforts are required to increase the awareness regarding various risk factors involved in HCV transmission. In developing countries, due to non-implementation of international standards regarding blood transfusion, reuse of needles for ear and nose piercing, reuse of syringes, injecting drug users, tattooing, shaving from barbers, unsterilized dental and surgical instruments are the main source of transmission of HCV. This article briefly presents the prevalence, genotypes and risk factors associated with HCV transmission in the Pakistani population.

#### **Possible risk factors & roots of transmission:**

The reuse of syringes and needles was a major factor contributing towards increased HCV prevalence [18,19]. It was reported that there are several small groups involved in recycling and repacking of used unsterilized syringes, which were available in various drug stores. It was difficult for the public to differentiate between new sterilized syringes and recycled unsterilized syringes [23]. Janjua et al [24] reported that 68% of individuals received injections

during the previous three months in Digri and Mirpur khas, two districts of Pakistan, out of which only 54% were from freshly opened syringes. The incidence of sharing of injection equipment for the last injection was 8.5% in Hyderabad and 33.6% in Sukkur [24]. In Pakistan, the number of estimated injections per person per year ranged from 8.2 to 13.6, which was the highest among developing countries, out of which 94.2% were unnecessary [25].

Household members who received four injections per year were 11.4% more prone to HCV infection than who did not receive injection [26]. Khan et al [18] reported that if both oral and injectable medicine were equally effective, 44% of the Pakistani population preferred injectable medicine. In 2000, the WHO recommended that countries should implement strategies to change the behavior of health care workers and patients in order to decrease the over-use of injections, to ensure the practice of sterile syringes and needles, and to properly destroy sharp waste after use [27]. It was reported that 59% of syringes were dumped into the general waste and not properly disposed of in the healthcare waste. Scavengers seeking valuable things from the waste are at high risk of receiving needle stick injuries from contaminated needles [20]. People in developing countries are mostly anemic, and are more prone to traumatic injuries and obstetric complications. Blood transfusion in these situations is life-saving. If blood is not properly stored or is carrying blood-borne pathogens, then the situation becomes more complicated. According to the WHO office in Pakistan about 1.2 to 1.5 million transfusions are carried out annually in Pakistan [28]. In 2000, Luby et al [27] reported that 50% of blood banks in Karachi recruited paid donors, 25% of donations were from volunteer donors and only 23% of the blood banks screened for HCV while 29% of them were storing blood outside the WHO recommended temperature.

In third world countries like Pakistan, most of the barbers are illiterate and unaware of transmission of infectious agents through the repeated use of razors and scissors for different customers without sterilizing them first [29]. Janjua and Nizamy reported that only 13% of the barber community knew that hepatitis is a liver disease and that it could be transmitted by contaminated razors; 11.4% of them were cleaning razors with antiseptic solution while 46% of them were re-using razors [30]. Recent reports suggested that only 42% knew about hepatitis, 90% did not wash hands, 80% were not changing aprons and 66% were not changing towels after each customer. Circumcision is a very important

religious procedure performed during early infancy both in rural and urban areas, and the barber community performing this procedure are mostly unaware of transmission of hepatitis by contaminated instruments [31]. Bari et al [31] identified the risk factors involved in transmission of HCV and reported that 70% and 48% of HCV patients had histories of facial and armpit shaving from barbers respectively. It has been reported from the US that up to 20% of new HCV infections are due to sexual activity [32]. Two different reports from the USA and Congo indicate low HCV prevalence among commercial sex workers [33,34]. The main problems in Pakistan are illiteracy, lack of awareness about sexually transmitted diseases and low use of condoms among the sex workers. Saleem et al [35] reported in 2005 that 17% of female sex workers, 3% of male sex workers and 4% of hijras (transgender men) consistently used condoms during the previous month; 67% of female sex workers were illiterate, 34% of female sex workers were suffering from sexually transmitted infections. Homosexual activities were very high among street children who are sexually victimized or indulge in such activities; later on they adopt commercial sex in order to raise their income. Condom usage among the male homosexual population was very low. Four different studies showed an interspousal percent prevalence of  $17.24\% \pm 7.98\%$  [36-39].

#### **Awareness:**

In the Pakistani population there was moderate knowledge about HCV infection whereas awareness about various HCV risk factors was very low [37,33,34]. In a survey conducted at a family medicine clinic in Karachi, most of the participants had some educational background and were living in Karachi city. It was reported that 61% of participants believed that HCV was a viral disease, 49% believed that it could be transferred by needles and injections, 5.3% believed that it could be transmitted by ear and nose piercing, and 20.6% knew that it can cause cancer [32]. Kuo et al [38] reported in 2006 that HCV awareness was only 19% in the IDU population of Lahore and Quetta. Zuberi et al [35] reported that knowledge about HCV infection was related to the educational background of the participants. Public awareness programs are required to decrease the future burden of HCV infection in the Pakistani population.

#### **Justification of study:**

Since Hepatitis C is now endemic in Pakistan & currently has high prevalence rate, it was assumed that there would already be a good level of knowledge about Hepatitis C & factors contributing

for development of disease in general and specially among the students of PU Campus at Gujranwala. The aim of our study was to assess the level of knowledge & we were also keen to know about the depth of concepts and awareness regarding factors contributing for development of Hepatitis C, its spread, symptoms and prevention among the students studying in different classes at Punjab University (PU) Campus Gujranwala.

#### **MATERIAL AND METHODS:**

- **Type of study:**

It is a Descriptive / cross sectional study in nature regarding assessment of knowledge of students studying at Punjab University (PU) Gujranwala campus, Gujranwala relating to factors contributing for developing Hepatitis C

- **Site of study:**

The study was conducted at PU Campus Gujranwala.

- **Study Population:**

Participants in the study were students from different Departments studying at Punjab University (PU) campus Gujranwala.

- **Sampling unit was:**

Students studying at Punjab University (PU) campus Gujranwala

- **Sampling frame:**

Consisted of Students from different Departments studying at Punjab University (PU) campus Gujranwala.

- **Sample size:**

Was consisted of at least 100 respondents

- **Sampling technique:**

Out of students from different Departments studying at Punjab University (PU) campus Gujranwala, at least 100 or plus students were selected by random sampling.

- **Data collection methodology:**

Data was collected from students studying of Punjab University (PU) campus Gujranwala. Data was collected by using semi structured questionnaire which was pretested.

- **Data compilation:**

The data was cleaned & entered into computer by using SPSS software (Statistical Package for data analysts). The same Package was used for data analysis. Data is being presented using tables, graphs.

- **Data collection tools used:**

The following data collection tools were developed and used.

1. A consent form was used to get the consent of the respondents wherever possible.
2. A semi structured Questionnaire was used to get information from study population.
3. The tools were pretested and modified according to requirements.

**Ethical consideration:**

It was important that the data collection process be conducted in a manner that is comfortable for each person, and in which the respondents and participants are often asked to give open, honest personal responses about Hepatitis C.

Every individual has the right to refuse or participate in study and not to respond to any specific question. The interviewers should respect this right. Fully informed, understood and voluntary Consent was obtained from the respondents either in writing or verbally wherever possible before collecting the data.

**Informed Consent:****RESULTS:**

In our study the overall questionnaire response was 100 %.

**FREQUENCY DISTRIBUTION OF CAUSATIVE AGENT OF HEPATITIS C?****TABLE. 1**

Causative Agent	Frequency	Percent	Valid Percent	Cumulative Percent
Bacteria	9	9.0	9.0	9.0
Fungus	1	1.0	1.0	10.0
Virus	87	87.0	87.0	97.0
Other	3	3.0	3.0	100.0
Total	100	100.0	100.0	100.0

Out of 100 student 87% of students responded that Virus was the causative agent of Hepatitis C. While others 9%, 1% and 3% responded that fungus bacteria and other causative agent were responsible for causing Hepatitis C.

**FREQUENCY DISTRIBUTION OF ORGAN AFFECTED IN HEPATITIS C****TABLE. 2**

Organ	Frequency	Percent	Valid Percent	Cumulative Percent
Liver	88	88.0	88.0	88.0
Kidney	9	9.0	9.0	97.0
Brain	1	1.0	1.0	98.0
Heart	2	2.0	2.0	100.0
Total	100	100.0	100.0	100.0

Out of 100 students 88% answered that Liver was the organ affected primarily in Hepatitis C while 9%,1% and 2% answered kidney brain and Heart respectively.

**FREQUENCY DISTRIBUTION OF MODE OF TRANSMISSION OF HCV INFECTION****TABLE. 3**

Mode	Frequency	Percent	Valid Percent	Cumulative Percent
Blood transfusion	19	19.0	19.0	19.0
Injections	13	13.0	13.0	32.0
Organ Transplant	20	20.0	20.0	52.0
Sex.contacts	35	35.0	35.0	87.0
Sharing Razors, toothbrushes	13	13.0	13.0	100.0
Total	100	100.0	100.0	100.0

35% responded that sexual contact was possible mode of transmission of HCV infection followed by 20% and 19% who believed that organ transplant and blood transfusion were the main modes of transmission of virus. 13 % answered that sharing of tooth brushes and razors were main causes of its transmission. Another 13% responded that use of injections was the source of transmission of HCV.

**FREQUENCY DISTRIBUTION OF SPREAD FROM MOTHER TO CHILD****TABLE. 4**

Yes/No	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	80	80.0	80.0	80.0
No	20	20.0	20.0	100.0
Total	100	100.0	100.0	100.0

80% believed that infection was transmittable from mother to child.

**FREQUENCY DISTRIBUTION OF RISKS OF DEVELOPING HCV****TABLE. 5**

Risk	Frequency	Percent	Valid Percent	Cumulative percent
Healthcare worker exposed to needle injury	7	7.0	7.0	7.0
Infants born to HCV infected mother	12	12.0	12.0	19.0
Injection drug users	6	6.0	6.0	25.0
Multiple sex partners	22	22.0	22.0	47.0
Organ donation	5	5.0	5.0	52.0
Recipient of blood and blood products	48	48.0	48.0	100.0
total	100	100.0	100.0	100.0

47% think recipient of blood and blood products are at the risk of developing HCV infection. 23 % thought that people with multiple sex partners were at the risk of developing HCV infection.

**FREQUENCY DISTRIBUTION OF WAY OF PREVENTION OF HCV SPREAD****TABLE. 6**

way	Frequency	Percent	Valid Percent	Cumulative Percent
Avoiding blood contact	77	77.0	77.0	77.0
Avoiding eating together	10	10.0	10.0	87.0
Avoid handshake	5	5.0	5.0	92.0
Not possible	8	8.0	8.0	100.0
total	100	100.0	100.0	100.0

77% believed that spread of HCV infection could be prevented by avoiding blood contacts. 10% said that prevention was possible by avoiding eating together, 5% said by avoiding hand shake and 8% said that its prevention is not possible.

**FREQUENCY DISTRIBUTION OF VACCINATION AVAILABLE FOR HCV****TABLE. 7**

Yes/No	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	71	71.0	71.0	71.0
No	29	29.0	29.0	100.0
Total	100	100.0	100.0	100.0

71% were of opinion that Vaccination was available against HCV infection and only 29% knew that it was not available.

**FREQUENCY DISTRIBUTION OF TREATMENT AVAILABLE FOR HEPATITIS C****TABLE. 8**

Yes/No	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	92	92.0	92.0	92.0
No	8	8.0	8.0	100.0
Total	100	100.0	100.0	100.0

92 % believed that the treatment of HCV infection was available. 8% said there is no treatment of this infection.

**FREQUENCY DISTRIBUTION OF RECURRENCE OF HEPATITIS C****TABLE. 9**

Yes/No	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	77	77.0	77.0	77.0
No	7	7.0	7.0	84.0
Not known	16	16.0	16.0	100.0
Total	100	100.0	100.0	100.0

77 % said that recurrence of HCV infection was possible and 7% responded with no. 16% said that they did not know about this.

**DISCUSSION:**

The current study sought to evaluate the knowledge regarding the risk factors of HCV infection among the students of Punjab University Gujranwala campus.

Response of survey was 100%. 56% participants were females and 44% were male. The age group was 18-26. The results of our study based in comparison with some previous studies and facts, showed that the students of Punjab University Gujranwala Campus had little knowledge about HCV, especially about the ways of transmission and prevention. The results revealed more misperceptions and poor knowledge about hepatitis C transmission as majority of student (35%) believed that sexual contact was common way of transmission of HCV. Less than 15 % were of opinion that transmission was through injections. Only 20 % thought that it was through the blood contacts. Majority of students correctly answered that virus could be spread from mother to child. The cross tabulation analysis suggested that blood transfusions surgical instruments reused needles/injections patient's history of practicing needles/injections , blood contacts were all significantly associated with status of HCV. Similarly sharing of toothbrush, razor and miswak were all significantly associated with status of HCV9. Majority of study respondents showed a lack of knowledge regarding mode of transmission of disease comparable to the studies conducted by Crutzen *et. al.* in Germany and Netherland. The studies done in China, Korea, Turkey, Spain and USA also showed poor knowledge in the community regarding HCV transmission. Although there have been multiple studies conducted on HCV prevalence and knowledge regarding risk factors in Pakistan but the present study results show

that HCV related awareness among population is still inadequate.

Cross sectional study of prevalence and risk factors of hepatitis b and hepatitis c infection in a rural village of India by **Department of Gastroenterology, Lokmanya Tilak Municipal Medical College, Sion Mumbai, India. Siddhakala Arurved Mahavidyalay Sangamner, Maharashtra, India** showed the following results.

Out of 2400 subjects, rate for participation was 76.38%. None of the subjects was positive for anti hepatitis C virus antibody. Point prevalence for HBsAg positivity was 0.92. Being healthcare worker and having tattoo were significantly associated with HBsAg positive results. Nose and ear piercing was reported by almost. History of blood or blood product transfusion, I/V drug abuse, multiple sexual partners, unsafe Injections, hemodialysis and any h/o surgery was not associated with HBsAg positivity. [40]

In our study the options to avoid HCV risk factors and transmission suggested by the respondents were to avoid blood transfusions and avoid drinking and eating with HCV patients. More than 90% participants knew that treatment was available for Hepatitis C. 70 % believed that vaccination for HCV was available and only 28% knew that it was not available.

**CONCLUSION:**

Summarizing the results of this study, these findings indicate an ambivalent knowledge about HCV infection amongst Punjab University Gujranwala students, many gaps were observed, suggesting the importance of continuous education about HCV in

this population to prevent HCV infection as well as discrimination and prejudice towards patients with hepatitis C.

### RECOMMENDATIONS

As hepatitis is a very important health problem affecting almost 10% of the population, we strongly recommend:

- Educational sessions and health awareness programs to raise awareness in the community through seminars, electronic and print media.
- Encourage doctors to do health education sessions during their consultation.

### LIMITATIONS

- Short duration of study.
- Small sample size so care must be taken while projecting these results to whole population.
- Study conducted only in Punjab University Gujranwala Campus so variation from these results can occur while considering other areas

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