

Professional paper

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## KNOWLEDGE OF HCV INFECTION AMONG NURSING STUDENTS OF THE MEDICAL COLLEGE OF BITOLA

Viktorija PRODANOVSKA-STOJČEVSKA<sup>1</sup>, Rozalinda ISJANOVSKA<sup>2</sup>, and  
Elizabeta POPOVA-RAMOVA<sup>1</sup>

*Medical College, University St. Kliment Ohridski, Bitola<sup>1</sup>, Faculty of Medicine, Sts. Cyril and Methodius University,  
Skopje<sup>2</sup>, Macedonia*

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Healthcare workers are at risk of occupationally-acquired viral infections such as human immunodeficiency virus (HIV), hepatitis B (HBV), and hepatitis C (HCV). HCV is parenterally transmitted and has been found in every part of the world. This cross-sectional study was conducted to establish the awareness and attitude about HCV infections among 210 full-time and part-time nursing students of the Medical College in Bitola, Macedonia from May to June 2009. For this purpose we used a self-administered questionnaire which consisted of three parts. The first included demographic data, the second included questions about causes of infection, mode of transmission, symptoms, acute and chronic hepatitis, and prevention, and the third questions about students' attitude toward patients with suspect or confirmed HCV infection. Full-time students showed higher HCV awareness (84 %) than part-time students (69 %). 58 % of the full-time and 79 % of the part-time students said they would not avoid professional contact with suspect or HCV infected patients. Our study has shown that even though both groups of students have a sufficient knowledge about HCV to face future challenges, they need further education on the subject. Practical recommendations would help to reduce stigmatising behaviour still further.

**KEY WORDS:** *bloodborne pathogens, healthcare workers, occupational risk*

Since the discovery of the hepatitis C virus (HCV) in 1989 and its identification as one of the leading causes of chronic liver disease with life-threatening sequelae such as end-stage cirrhosis and liver cancer (1), questions have been raised about the burden of disease caused by the virus (2). Data on the burden of hepatitis C in Europe are scarce, outdated or inconclusive, and our study indicates that hepatitis C is still a neglected disease in many countries (2). HCV is parenterally transmitted and has been found in every part of the world (3, 4).

Healthcare workers run the occupational risk of infection with human immunodeficiency virus (HIV), hepatitis B (HBV), and hepatitis C (HCV) (5). Infection is most often bloodborne through broken

skin or mucous membrane (6). The risk of infection after an injury is about 33 % for HBV, 3.3 % for HCV, and 0.33 % for HIV (7).

The prevalence of anti-HCV in healthcare workers is 1 % to 5 % (8). The occupational risk of HCV transmission is real and is best controlled by rigorous universal infection precautions against nosocomial HCV infection (9, 10).

In Birmingham teaching hospitals, respondents to a questionnaire exhibited substantial lack of knowledge about HBV, HCV, and HIV transmission risks (11). A study by Janjua et al. (12) with healthcare workers in Pakistan has shown that education about infections leads to improved use of universal precautions against bloodborne pathogens. As students of medicine or

nursing as also exposed to the risk of contracting bloodborne infections, education on infection control should also include them (13).

According to several studies of clinical practice, patients infected with HBV and HCV suffer from some level of stigmatisation and avoidance of care (14, 15).

The aims of this study were to establish students' knowledge about HCV infections, risk behaviour, modes of transmission and prevention and to evaluate their attitude toward patients with suspect or confirmed HCV infection.

## SUBJECTS AND METHODS

Our cross-sectional study included 210 senior nursing students - prospective health-care workers - of the Medical College in Bitola and took place from May to June 2009. Additionally, we wanted to compare 110 full-time students, who attended all classes for six semesters, and 100 part-time students, who already worked as nurses (with secondary schools diplomas) and who decided to continue education and obtain a bachelor's degree. Both groups of students had the identical programme, but the part-time students were relieved of some of the classroom obligations. All participating students were about to complete their studies (few exams away) and to receive a bachelor's degree in nursing.

We used a non-standardised, anonymous, self-administering questionnaire that consisted of three parts: 1) socio-demographic data; 2) knowledge about HCV infections; and 3) students' attitude toward HCV-positive patients.

The first part included data about the age, sex, years of study, type of study, secondary education, and employment.

To make processing easier, the second part included a set of YES/NO questions about viral pathogenesis, modes of transmission, risk factors (blood transfusion before 1995, surgical or gynaecology intervention, dental intervention, tattoos, piercing, intravenous drug users, haemodialysis, and occupational exposure), symptoms, diagnosis, and infection prevention.

The third part included questions about attitudes toward persons who might or are infected with HCV.

The collected data are shown in tables and figures. Statistical significance was tested using the chi-square test and the *t*-test.

## RESULTS

Table 1 shows the socio-demographic data for full-time and part-time students. The groups significantly differed in age [full-time=(21.9±2.1) years; part-time=(33.8±7.8) years,  $P<0.001$ , Table 1].

**Table 1** Student demographic data

Student data	Full-time	Part-time
Male	23	11
Female	87	89
Employed		90
Unemployed	110	
Average age ± SD / years (range)	21.9±7.82 (21 to 40)	33.8±2.07* (19 to 48)
Secondary school with nursing programme	73	89
Secondary school with other programmes	25	7
Other	12	4

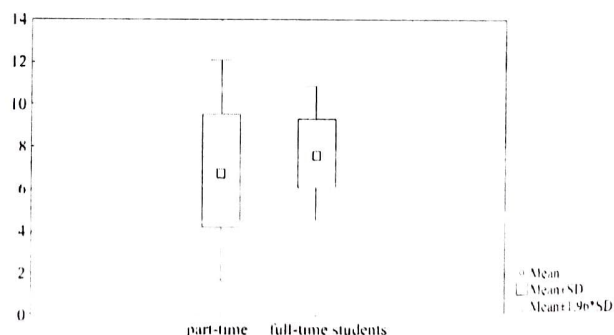
\*difference statistically significant at  $P<0.001$

### Knowledge about HCV infection

Full-time students had a greater score of true answers about general knowledge of HCV infection (viral pathogenesis, symptoms, diagnosis and infection prevention) than part-time students (84 %, vs. 69 %;  $P<0.01$ ). Pearson's chi-square test confirmed the dependence between the full-time/part-time status and true score ( $\chi^2=59.84$ ,  $P<0.001$ ,  $Df=1$ ).

Figure 1 shows that full-time students scored significantly higher than part-time students in the questionnaire section on infection risk factors [means: (7.7±1.6) vs. (6.9±2.7), respectively;  $P=0.0089$ ].

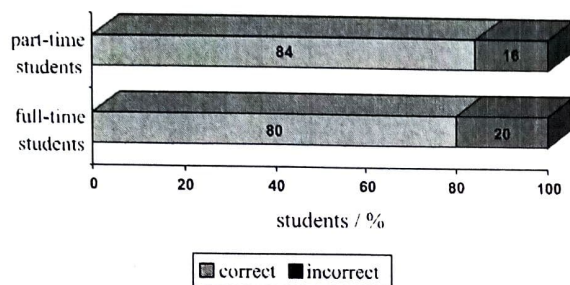
As for the questions about HCV transmission modes, 84 % of the full-time students and 80 % of



**Figure 1** Students' score of correct answers about HCV infection risk factors by group



the part-time students answered correctly, and the difference was not significant (Figure 2).



**Figure 2** Percent of students with correct and incorrect answers on modes of HCV transmission by groups

### Students' attitude toward suspect or infected HCV patients

Our results show that 58 % full-time and 79 % part-time students do not avoid professional contact with suspect infected HCV patients, while 65 % full-time and 80 % part-time students do not avoid any kind of contact with them ( $P < 0.001$ ). Pearson's chi-square test confirmed the dependence between the full-time/part-time status and willingness to contact HCV patients (Pearson's  $\chi^2 = 16.409$ ,  $P < 0.001$ ,  $Df = 1$ ).

## DISCUSSION AND CONCLUSION

Students in this cross-sectional study were mostly young women, which is usual for a nursing school. As expected, most of the students had completed a secondary school with a medical programme.

As we said earlier, there full-time students were significantly older than part-time students as they immediately move on to college from the secondary school and the latter study with work. A research conducted in Israel showed a high level of knowledge among 180 nurses about blood-borne infections and better knowledge of HBV than HCV infection (15).

While both our groups have generally shown a high level of knowledge about HCV infection, full-time students scored significantly higher (89 % and 64 % correct answers, respectively). We believe that this is the result of regular attendance to theoretical and practical classes.

Both of our groups showed sufficient knowledge about the risk factors (85 % and 76 %). These results are similar to the findings for the University of Karachi students (95 % and 67 %) (16).

Both our groups of students also showed a high level of knowledge about HCV transmission. This is because the full-time students have sufficient knowledge about HCV infection and the part-time students pay more attention to the mode of transmission to protect themselves. Again, these results are similar to the Karachi University findings (98 %) (16).

One of the aims of this study was to see students' attitude toward patients with suspect or confirmed HCV infection; 38.6 % full-time and 20.5 % part-time said they avoided contact with these patients. This is most probably because the full-time students are more aware of HCV infection risks than the part-time students. In Israel, the percentage of nurses who shun contact (77.3 %) with HIV, HBV, and HCV infected patients is much higher (15), but this may mostly be related to the fear of HIV/AIDS (17). These results however confirm that HCV patients are stigmatised (18-21) and that this kind of intolerance leads adversely affects the quality of patient care (22).

Our study has shown that even though both groups of students have a sufficient knowledge about HCV, they need further education on the subject. This is particularly true for the part-time students, who need more hours in the classroom.

Stigmatising attitude towards infected HCV patients should be addressed by focusing on practical recommendations for infection prevention.

All things considered, however, our nursing students are prepared for the challenges that come with profession.

### Acknowledgement

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## REFERENCES

1. Lauer GM, Walker BD. Hepatitis C virus infection. *N Engl J Med* 2001;345:41-52.
2. Mühlberger N, Schwarzer R, Lettmeier B, Sroczynski G, Zeuzem S, Siebert U. HCV-related burden of disease in Europe: a systematic assessment of incidence, prevalence, morbidity, and mortality. *BMC Public Health* 2009;9:34.
3. Purcell RH. Hepatitis C virus. In: Webster RG, Granoff A, editors. *Encyclopedia of Virology*. London: Academic Press Ltd; 1994. p. 569-74.

4. World Health Organization (WHO). Hepatitis C 1997 [displayed 22 March 2010]. Available at: <http://www.who.int/inf-fs/en/fact164.html>.
5. Scoular A, Watt AD, Watson M, Kelly B. Knowledge and attitudes of hospital staff to occupational exposure to bloodborne viruses. *Commun Dis Public Health* 2000;3:247-9.
6. Royal College of Nurses. Universal precautions. *Nurs Stand* 1997;11:32.
7. UK Health Departments. Guidance for clinical health care workers: protection against infection with blood-borne viruses. Recommendations of the Expert Advisory Group on AIDS and the Advisory Group on Hepatitis 1998 [displayed 22 March 2010]. Available at: [http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/@dh/@en/documents/digitalasset/dh\\_4014474.pdf](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4014474.pdf).
8. World Health Organization (WHO). Hepatitis C, 2002 [displayed 22 March 2010]. Available at: <http://www.who.int/csr/disease/hepatitis/Hepc.pdf>.
9. Memon MI, Memon MA. Hepatitis C: an epidemiological review. *J Viral Hepatol* 2002;9:84-100.
10. Schvarcz R, Sönnerborg A, Johansson B, Nyström B. Nosocomial transmission of hepatitis C virus. *Infection* 1997;25:74-7.
11. Stein AD, Makarawo TP, Ahmad MF. A survey of doctors' and nurses' knowledge, attitudes and compliance with infection control guidelines in Birmingham teaching hospitals. *J Hosp Infect* 2003;54:68-73.
12. Askarian M, Honarvar B, Tabatabaee HR, Assadian O. Knowledge, practice and attitude towards standard isolation precautions in Iranian medical students. *J Hosp Infect* 2004;58:292-6.
13. Janjua NZ, Razaq M, Chandir S, Rozi S, Mahmood B. Poor knowledge-predictor of nonadherence to universal precautions for blood borne pathogens at first level care facilities in Pakistan. *BMC Infect Dis* 2007;7:81.
14. Butt G. Stigma in the context of hepatitis C: concept analysis. *J Adv Nurs* 2008;62:712-24.
15. Kagan I, Ovadia KL, Kaneti T. Perceived knowledge of blood-borne pathogens and avoidance of contact with infected patients. *J Nurs Scholarsh* 2009;41:13-9.
16. Anjum Q, Siddiqui H, Ahmed Y, Rizvi SR, Usman Y. Knowledge of students regarding hepatitis and HIV/AIDS of a private medical university in Karachi. *J Pak Med Assoc* 2005;55:285-8.
17. Rödahl G, Innala S, Carlsson M. Nursing staff and nursing students' attitudes towards HIV-infected and homosexual HIV-infected patients in Sweden and the wish to refrain from nursing. *J Adv Nurs* 2003;41:454-61.
18. Cormier M. The role of hepatitis C support groups. *Gastroenterol Nurs* 2005;28(3 Suppl):S4-9.
19. Grundy G, Beeching N. Understanding social stigma in women with hepatitis C. *Nurs Stand* 2004;19:35-9.
20. Mohamed R, Desmond P, Suh DJ, Amarapurkar D, Gane E, Guangbi Y, Hou JL, Jafri W, Lai CL, Lee CH, Lee SD, Lim SG, Guan R, Phiet PH, Piratvisuth T, Sollano J, Wu JC. Practical difficulties in the management of hepatitis B in the Asia-Pacific region. *J Gastroenterol Hepatol* 2004;19:958-69.
21. Zacks S, Beavers K, Theodore D, Dougherty K, Batey B, Shumaker J, Galanko J, Shrestha R, Fried MW. Social stigmatization and hepatitis C virus infection. *J Clin Gastroenterol* 2006;40:220-4.
22. Kyle TV. The concept of caring: a review of the literature. *J Adv Nurs* 1995;21:506-14.



### *Sažetak*

## KOLIKO SU STUDENTI VIŠE MEDICINSKE ŠKOLE U BITOLI UPOZNATI S PROBLEMOM INFEKCIJE HCV-OM

Zdravstveni su radnici izloženi profesionalnomu riziku od infekcije virusom humane imunodeficijencije (HIV-om), hepatitis B virusom (HBV-om) te hepatitis C virusom (HCV-om). HCV se prenosi parenteralno i ima ga posvuda u svijetu. Ovo smo presječno ispitivanje proveli da utvrdimo koliko su studenti za medicinske tehničare i sestre upoznati s infekcijom HCV-om i saznamo njihove stavove o tome. Ispitivanje je obuhvatilo 210 redovitih i izvanrednih studenata Visoke medicinske škole u Bitoli i trajalo je od svibnja do lipnja 2009. Za ispitivanje je rabljen opširan upitnik. Odgovori su pokazali da redoviti studenti imaju bolji uvid u predmet (s 84 % točnih odgovora) od izvanrednih studenata (69 %). U pogledu stava prema pacijentima 58 % redovitih i 79 % izvanrednih studenata ne izbjegava dodir s pacijentima koji su inficirani HCV-om. Ispitivanje je pokazalo da su studenti iz obje skupine dovoljno upoznati s infekcijom HCV-om, rizičnim čimbenicima i načinom prijenosa, ali je potrebno to znanje nadograditi.

**KLJUČNE RIJEČI:** *patogeni koji se prenose krvlju, profesionalni rizik, zdravstveni radnici*