ISSN: 1981-8963 DOI: 10.5205/reuol.2226-17588-1-LE.0604201218

Journal of Nursing
Revista de Enfermagem
UFPE On Line
ISSN: 1981-8963

ORIGINAL ARTICLE

EVALUATION OF THE KNOWLEDGE OF NURSING STUDENTS ABOUT VIRAL HEPATITIS

AVALIAÇÃO DO CONHECIMENTO DOS ESTUDANTES DE ENFERMAGEM SOBRE AS HEPATITES VIRAIS

EVALUACIÓN DEL CONOCIMIENTO DOS ESTUDANTES DE ENFERMERÍA SOBRE LAS HEPATITIS VIRALES

Viviane Câmara Maniero[1], Tania Goldbach[2], Ana Paula Costa Marques[3], Larissa dos Santos Pereira Cavaretto[4], Andreza Moreira Oliveira dos Santos[5], Livia Melo Villar[6]

ABSTRACT

Objective: to describe the knowledge of viral hepatitis among nursing students in two institutions located in two different geographical areas of Brazil. ***Method***: a descriptive, exploratory and quantitative study where 180 students were selected from two nursing higher education institutions (102 in Rio de Janeiro, Southeast and 78 of Mato Grosso do Sul, Midwest), who answered a questionnaire composed of 37 questions about socio-demographic factors and level of knowledge about viral hepatitis after signing a consent form. For data evaluation, a score of knowledge about hepatitis was created based on participants' responses, where "low" (0-21 correct answers), "good" (22-28 correct answers) and "excellent" (29 - 37 correct answers). The variables: age, sex and place of residence were used to assess knowledge of hepatitis and sociodemographic characteristics. This study was approved by the Ethics Committee of the University of Rio Grande (RJ) (protocol number CAAE 0006.0.317.000-08). ***Results***: the mean knowledge about viral hepatitis was 25.95 ± 4.79 showing a good knowledge about viral hepatitis in this population. However, some gaps were analyzed for transmission of viral hepatitis, etiology, and symptoms as well as significant differences in knowledge scores between students from different geographical areas. ***Conclusions***: despite the good general knowledge on the subject, it is necessary to enhance awareness and training strategies on viral hepatitis among nursing students to increase knowledge on this topic. ***Descriptors***: knowledge; hepatitis, viral, human; education; health personnel.

RESUMO

Objetivo: descrever o conhecimento sobre a hepatite viral entre estudantes de enfermagem de duas instituições localizadas em duas diferentes áreas geográficas do Brasil. ***Método***: estudo descritivo, exploratório de abordagem quantitativa onde foram selecionados 180 alunos de enfermagem de duas instituições de ensino superior (102 do Rio de Janeiro, região Sudeste e 78 do Mato Grosso do Sul, região Centro-Oeste), os quais responderam um questionário composto de 37 questões sobre fatores sócio-demográficos e nível de conhecimento sobre a hepatite viral após assinatura de termo de consentimento. Para avaliação dos dados, um escore de conhecimento sobre hepatites foi criado com base nas respostas dos participantes, onde: "baixo" (0-21 respostas corretas), "bom" (22-28 respostas corretas) e "excelente" (29-37 respostas corretas). As variáveis: idade, sexo e local de residência foram utilizadas para avaliar o conhecimento entre hepatites virais e características sócio demográficas. Este estudo foi aprovado pelo Comite de ética da Universidade do Grande Rio (RJ) (Número de protocolo CAAE 0006.0.317.000-08). ***Resultados***: a média de conhecimento sobre hepatites virais foi de 25,95 ± 4,79 mostrando um bom conhecimento sobre a hepatite viral nessa população. Entretanto algumas lacunas foram observadas quanto à transmissão da hepatite viral, etiologia e sintomas, assim como diferenças significativas nos escores de conhecimento entre estudantes de diferentes áreas geográficas. ***Conclusão***: apesar do bom conhecimento geral sobre o assunto, é necessário intensificar a conscientização e as estratégias de formação sobre a hepatite viral entre estudantes de enfermagem para melhorar o conhecimento sobre este tópico. ***Descritores***: conhecimento; hepatite viral humana; educação; pessoal de saúde.

RESUMEN

Objetivo: describir el conocimiento sobre hepatitis virales entre los estudiantes de enfermería en dos instituciones ubicadas en dos áreas geográficas diferentes de Brasil. ***Método***: un enfoque descriptivo, exploratorio cuantitativo donde 180 estudiantes fueron seleccionados a partir de dos instituciones de educación superior de enfermería (102 en Río de Janeiro, sudeste y 78 de Mato Grosso do Sul, Centro-Oeste), respondieron a un cuestionario compuesto de 37 preguntas sobre los factores sociodemográficos y nivel de conocimiento sobre hepatitis virales después de firmar un formulario de consentimiento. Para la evaluación de datos, una veintena de conocimiento sobre hepatitis fue creado en base a respuestas de los participantes, donde "bajo" (0-21 respuestas correctas), "bueno" (22-28 respuestas correctas) y "excelente" (29 - 37 respuestas correctas). Las variables: edad, sexo y lugar de residencia se utilizaron para evaluar el conocimiento de hepatitis y características sociodemográficas. Este estudio fue aprobado por el Comité de Ética de la Universidad de Río Grande (RJ) (número de protocolo CAAE 0006.0.317.000-08). ***Resultados***: el conocimiento medio sobre hepatitis virales fue 25,95 ± 4,79 mostrando un buen conocimiento sobre hepatitis virales en esta población. Sin embargo, algunas diferencias fueron observadas acerca de la transmisión, la etiología y síntomas de las hepatitis virales, así como diferencias significativas en las puntuaciones de conocimientos entre estudiantes de diferentes áreas geográficas. ***Conclusiones***: a pesar de los conocimientos generales sobre el tema, es necesario mejorar el conocimiento y las estrategias de capacitación sobre las hepatitis virales entre los estudiantes de enfermería para aumentar el conocimiento sobre este tema. ***Descriptores***: conocimiento; hepatitis viral humana; educación; personal de salud.

[1]Biologist. Specialist in Science Education. Biologist at the National School of Public Health/FIOCRUZ. Rio de Janeiro (RJ), Brazil. E-mail: vivianemaniero@yahoo.com.br; [2]Biologist. Ph.D. Professor from the Federal Institute of Rio de Janeiro (IFRJ). Rio de Janeiro (RJ), Brazil. E-mail: tania.gold@gmail.com; [3]Biologist. M.A. Ph.D student at the Central-West Region Health and Development Program. Professor from the Pathology Department of the Federal University of Mato Grosso do Sul. Campo Grande (MS), Brazil. E-mail: apcmarques@hotmail.com; [4]Nurse. M.D. Health fiscal agent from the Municipal Public Health Council - Campo Grande (MS), Brazil. E-mail: larissacavaretto@hotmail.com; [5]Technician. Biology undergraduate student at Grande Rio University. Technician from the National School of Public Health/FIOCRUZ. Rio de Janeiro (RJ), Brazil. E-mail: andrezasantosferreira@gmail.com; [6]Biomedical professional. Ph.D. Technologist from the Viral Hepatitis Laboratory of the Oswaldo Cruz Institute/FIOCRUZ. Rio de Janeiro (RJ), Brazil. E-mail: lvillar@ioc.fiocruz.br.

Paper developed from the monograph << ***Perception of viral hepatitis among undergraduate nursing students*** >>, submitted to the Graduate Program in Science Education of the Federal Institute of Rio de Janeiro. Rio de Janeiro-RJ, Brazil. 2009.

Study carried out with financial support from the Rio de Janeiro Research Funding Agency (FAPERJ).

INTRODUCTION

Viral hepatitis infection remains as a major public health issues worldwide with 1.4 million new cases of Hepatitis A virus infection are notified per year worldwide[1], 350 million people infected with Hepatitis B virus (HBV)[2] and 130 to 170 million people infected with Hepatitis C virus (HCV).[3] In Brazil, rates of viral hepatitis infection may vary according geographical area or professional occupation.[4-8]

HBV, HCV and Hepatitis D virus (HDV) are transmitted by parenteral and sexual routes due to unsafe use of therapeutic injections, blood transfusions, mother to child transmission, unsafe sexual practices.[2-3] On the other hand, HAV and HEV are transmitted by oral fecal route and most infections resulted from close contact with an infected person or in settings with poor hygienic conditions.[1]

Health professionals represent a high risk group for acquisition of viral hepatitis, and nursing staff is one of the principal job categories exposed to biological accidents in Brazil.[9] This high number of exposures is due to greater representation of this group in the health services and direct contact in assisting users of the health system, as well as the type and frequency of procedures performed.[9] Moreover the coverage of hepatitis B vaccination among health professionals is unsatisfactory in Brazil, with high percentages of incomplete outline of up to 64.6%.[10]

To define the level of knowledge about viral hepatitis amongst health professionals is important in helping to reduce the burden of disease. Nurses are the largest group of healthcare professionals and may be the first professional to assess people with viral hepatitis. These professionals have to be able to recognize the aspects related to pathogenesis and viral hepatitis transmission and the care of patients of such infections is essential, since they routinely seek hospital care. Despite the importance of nursing staff in viral hepatitis management, there is little research that sheds light on the knowledge and awareness of viral hepatitis infection among nursing staff in Brazil.[11-13]

In this light, it was proposed in this study, a survey of knowledge about the etiology, diagnosis, signs and symptoms, treatment and prevention of viral hepatitis among Brazilian nursery students regarding to viral hepatitis in order to identify the gaps that can be present in this group.

METHOD

● Study design

During March to July 2008, a cross-sectional survey was carried out among a non randomized sample of Brazilian nursing students from the Southeast and Mid-West regions of Brazil regarding viral hepatitis knowledge. The sample included all nursing students who agreed to participate in this study from two universities, one located at Rio de Janeiro (RJ), Southeast region of Brazil and other at Mato Grosso do Sul (MS), Mid West region of Brazil. These universities were chosen due to the convenience.

● Study population

A sample size of 100 individuals was targeted, and assuming a response rate of 75-80%, 75 completed questionnaires would yield a power of 80% with a 5% type 1 error rate to detect a 16% difference when comparing dichotomous variables between two groups of equal size. During the period of the study, 300 students were registered in two nursing courses from two private universities, one located at Duque de Caxias County (RJ) and the other at Campo Grande City (MS). A sample of 180 students [102 were from Rio de Janeiro (group 1) and 78 were from Mato Grosso do Sul (group 2)] agreed to participate in this study after signing the consent form and answered the questionnaire. The questionnaire was anonymous, and was applied in the structured interview format by the authors of this study. The form contained only a separate order number for each participant.

One of the authors made contact with professors from both universities and all of the nursing students aged 18 and above were considered theoretically eligible for this study. These nursing students were previously informed 15 days before the beginning of sample collection in which they were asked whether they would be willing to respond to a brief questionnaire regarding viral hepatitis knowledge. The same methodology was administered at two centers. Inclusion criteria were adopted as follows: being nursing students, of both sex, of any ethnicity and aged between 18 and 70 years. The exclusion criteria: no agreement to participate.

● Questionnaire

The questionnaire was divided into two topics: 1) demographic characteristics, 2) knowledge of viral hepatitis transmission, diagnosis, epidemiology and risk factors, prevention and general information. The questionnaire consisted of 37 items in two

formats: 34 true/false/don't know questions; three (3) multiple choice questions requiring one or more answers. The questionnaire was applied as an interview by one of the authors in a confidential setting. The questionnaire was developed by the authors following a review of the literature on viral hepatitis aspects and it was pre-standardized on a convenience sample of health professionals that presented similar characteristics of the population studied (data not shown). At the end of the interview, the correct answers were shown to each volunteer.

● Data collection and analysis

Data was entered into an Excel file. Two members of the team entered the same data twice and the data files were compared to rule out errors in entering the data.

The viral hepatitis knowledge score was created based on the participants responses that were scored as follows: "low" (0–21 correct answers), "good" (22–28 correct answers) and "excellent" (29–37 correct answers). The following variables were used to examine associations between knowledge of viral hepatitis and socio- demographic characteristics: age, sex, and place of residence.

Descriptive statistics were generated for the responses, and the chi-squared for independence or for trend and the Kruskal-Wallis test was used to compare categorical and continuous variables among the knowledge score groups. The two tailed test *p*-values < 0.05 were considered significant. All of the analyses were made using GraphPad Instat version 3.0 for Windows.

● Ethical consideration

Ethical approval was given by Ethic Committee of the Universidade do Grande Rio, Rio de Janeiro, Brazil (Protocol number CNS 0006.0.317.000-08). Respondents were ensured about confidentiality, they were briefed that their participation was voluntary and that they had full right to withdraw from the study at any point. Informed consent was obtained from all the participants before joining the survey.

RESULTS

● Sample population

Study population comprised 146 women and 34 men, 102 individuals were from Rio de Janeiro and 78 were located at Mato Grosso do Sul. Participants' ages ranged from 18 to 59, the mean was 23.6 years old (SD 5.9 years). Individuals from Rio de Janeiro present higher mean age (26 years ± 6.4 *vs.* 20.8 years ± 3.4) and higher female participation (84.3% vs. 76.9%). when compared to Mato Grosso do Sul.

♦ General knowledge about viral hepatitis

In terms of aetiology, 51.7% recognized that virus, alcohol, bacteria and drugs can cause hepatitis and 62.7% reported that five viruses can cause hepatitis. In terms of diagnosis, most of students answered that viral hepatitis can be diagnosed by blood analysis (97.7%) or hepatic biopsy (71.6%) (Table 1). Concerning Viral Hepatitis symptoms, most of the students answered correctly and recognized that the person with viral hepatitis can feel nothing (68.8%), can present fever, nausea, malaise, weakness and loss of appetite (88.3%), can present yellow skin, pale faeces and dark urine (81.6%). Most of the students recognized that one possible consequence of viral hepatitis is cirrhosis (80%) or hepatocarcinoma (68.3%). It is important to note that few students thought that viral hepatitis do not lead loss of movements (48.3%), bleeding of the mouth (21.1%) or blood in the stools (16.1%) (Table 1).

Table 1. Knowledge about viral hepatitis (etiology, diagnosis and symptoms) among brazilian nursing students from two universities, one located at Rio de Janeiro (n=102) and the other located at Mato Grosso do Sul (*n*=78)

Correct Statement	Total n =180	%	Rio de Janeiro Total = 102 n (%)		Mato Grosso do Sul Total = 78 n	%
Etiology						
Hepatitis can be caused due alcohol, virus, bacteria and drugs.	93	(51.7)	65	(63.7)	28	(35.9)
There are five viruses that can cause hepatitis.	113	(62.7)	78	(76.5)	35	(44.9)
Diagnosis						
Viral Hepatitis can be detected by blood analysis	176	(97.7)	98	(96.1)	78	(100)
Viral Hepatitis can not be diagnosed by hepatic biopsy.	129	(71.6)	75	(73.5)	54	(69.2)
Signals and Symptoms						
The person with viral hepatitis can feel nothing	124	(68.8)	71	(69.6)	53	(67.9)
The person with hepatitis can present fever, nausea, malaise, weakness and loss of appetite	159	(88.3)	99	(97.0)	60	(76.9)
The person with hepatitis can present yellow skin, pale stools and dark urine.	147	(81.6)	93	(63.2)	54	(69.2)
One possible consequence of viral hepatitis is cirrhosis	144	(80)	95	(93.1)	49	(62.8)
One possible consequence of viral hepatitis is hepatocarcinoma	123	(68.3)	73	(71.6)	50	(64.1)
Viral Hepatitis do not lead loss of movements	87	(48.3)	59	(57.8)	28	(35.9)
Viral Hepatitis do not cause bleeding of the mouth	38	(21.1)	30	(29.4)	8	(10.2)
Viral Hepatitis do not lead to blood in the stools.	29	(16.1)	26	(25.5)	3	(3.8)

Regarding viral hepatitis transmission, most of the students reported that hepatitis B and C can be transmitted by blood (99.4%) or sexual intercourse (95%). Most of them also recognized that hepatitis A and E can be transmitted by ingestion of water without treatment (89.4%), but minority of them reported that these viruses can be transmitted by ingestion of sea food (31.1%). Most of the students also recognized laboratory workers (85.5%), health workers (95.5%), drug users (97.2%) and people with tattoo and piercing (92.7%) have a higher risk of becoming contaminated with hepatitis viruses (Table 2).

Concerning Viral hepatitis prevention, most of the students reported the existence of vaccines for hepatitis A and B (87.7%), but only 51.1% of them reported that hepatitis A can be prevented by vaccine. Most of them also recognized that hepatitis A and E can be prevented by the construction of drains and sewerage system effective (86.6%) or by water treatment (86.1%). It is important to note that majority of the students reported that hepatitis B and C can be prevented by blood donors screening (91.1%) or condom usage for sexual intercourse (93.3%) (Table 2).

Table 2. Knowledge about viral hepatitis (transmission, prevention) among Brazilian nursing students from two universities, one located at Rio de Janeiro (n=102) and the other located at Mato Grosso do Sul (*n*=78)

Correct Statement	Total n=180 %	Rio de Janeiro Total = 102 n %	Mato Grosso do Sul Total = 78 n %
Transmission			
Hepatitis A and E can be transmitted by ingestion of sea food.	56 (31.1)	36 (35.3)	20 (25.6)
Hepatitis B and C can be transmitted by blood.	179 (99.4)	101 (99.0)	78 (100)
Hepatitis B and C can be transmitted by sexual intercourse	171 (95)	99 (97.0)	72 (92.3)
Hepatitis A and E can be transmitted by ingestion of water without treatment.	161 (89.4)	98 (96.1)	63 (80.7)
Laboratory workers have a higher risk of becoming contaminated with hepatitis viruses.	154 (85.5)	87 (85.3)	67 (85.9)
Health workers as doctors and nurses have a higher risk of becoming contaminated with hepatitis viruses.	172 (95.5)	95 (93.1)	77 (98.7)
Drug Users have a higher risk of becoming contaminated with hepatitis viruses.	175 (97.2)	98 (96.0)	77 (98.7)
Persons with tattoo and piercing have a higher risk of becoming contaminated with hepatitis viruses.	167 (92.7)	95 (93.1)	72 (92.3)
Prevention			
There available vaccines for hepatitis A and B.	158 (87.7)	88 (86.3)	70 (89.7)
Hepatitis A and E can be prevented by the construction of drains and sewerage system effective.	156 (86.6)	92 (90.2)	64 (82.0)
The hepatitis A and E can be prevented by water treatment.	155 (86.1)	92 (90.2)	63 (80.7)
Hepatitis A can be prevented by administration of vaccine.	92 (51.1)	38 (37.2)	54 (69.2)
Hepatitis B and C can be prevented by blood donors screening.	164 (91.1)	95 (93.1)	69 (88.5)
Hepatitis B and C can be prevented by using condoms for sexual intercourse.	168 (93.3)	98 (96.1)	70 (89.7)

♦ Knowledge about viral hepatitis according to the main characteristics.

Viral hepatitis knowledge scores on a scale of 0-37 were moderately adequate (mean ± SD = 25.95 ± 4.79; range 12–33), showing gaps in some aspects of viral hepatitis symptoms and etiology. None of the students responded correctly or incorrectly to all questions. Thirty five individuals were classified as low knowledge (0-21 correct answers), 84 individuals had good knowledge (22-28 correct answers) and 61 of them had excellent knowledge (29-36 correct answers) (Table 3). General knowledge level was only associated with place of residence. Most of the students from Mato Grosso do Sul presented lower knowledge compared to the students from Rio de Janeiro ($p < 0.0001$).

Table 3. Knowledge scores about viral hepatitis among Brazilian nursing students.

Characteristic	Knowledge Score *n* (%)			*p*
	Low (*n*=35)	Good (*n*=84)	Excellent (*n*=61)	
1.Sex				**0.36**
Male	6 (17.1)	13 (15.5)	15 (24.6)	
Female	29 (82.9)	71 (84.5)	46 (75.4)	
2.Age (Years)				**0.06**
≤ 23	28 (80)	45 (53.6)	30 (49.2)	
> 23	7 (20)	39 (46.4)	31 (50.8)	
3. Place of Residence				**<0.0001**
Rio de Janeiro	6 (17.1)	51 (60.7)	45 (73.8)	
Mato Grosso do Sul	29 (82.8)	33 (39.3)	16 (26.2)	

DISCUSSION

This study was an interview survey exploring the knowledge in regard to viral hepatitis among nursing students from Brazil and found good knowledge regarding viral hepatitis among nursing students. Most of individuals were aware about some aspects regarding to viral hepatitis diagnosis, transmission, symptoms and prevention what was not observed among nurses from Ireland[14] and Brazil.[12] On the other hand, less than 70% of nursing students recognized the existence

of 5 hepatotropic viruses what was lesse than reported among pediatricians attending a course in Brasilia (Mid West region of Brazil)[15], showing that some knowledge gaps are still present.

In the present study, majority of nursing students recognized that viral hepatitis diagnosis is made by blood analysis, but almost 30% of nursing students did not know the role of hepatic biopsy for viral hepatitis diagnosis showing the importance of some elucidation about this topic. Regarding to viral hepatitis symptoms, most of them recognized that fever; yellow skin and pale faeces can be observed, but almost 70% of nursing students people with viral hepatitis can feel nothing, and this disease can not lead to loss of movements, blood in mouth and blood in stools. These gaps were also identified among dentist students from Pernambuco (Northeast region of Brazil)[16] and the rate was higher than reported by health professionals in China regarding to chronic hepatitis B infection (34%).[17] Nurses should recognize the symptoms of viral hepatitis to management and to give correct information to the general population. Therefore higher number of Rio de Janeiro students recognized signals and symptoms of viral hepatitis more frequently compared to Mato Grosso do Sul students confirming some gaps of knowledge according geographical area in Brazil. Cirrhosis and Hepatocarcinoma are possible complication of viral hepatitis B and C[18] and this complication were not recognized from 36 (20%) and 57 (31.7%). This rate was much higher than reported among university students from health area in Ribeirão Preto (São Paulo, Brazil)[13] and similar to that reported by public health professionals from China (29%).[17]

Most of nursing students believe that the contamination for HBV and HCV occurs by the contact with blood or secretions from an infected person such as showed among adolescents from Santa Catarina (South Region from Brazil)[19] and nursing students from Southeast, Mid West and Northeast regions from Brazil[10]. Majority of nursing students from the present study reported HAV and HEV can be transmitted by water, but few of them recognized that their transmission can be due seafood ingestion.

Risk groups for viral hepatitis transmission, as health workers, drug users, tattoo and piercing, were also reported by both groups. Rossi et al.[13] also showed that university students from health area in Ribeirão Preto (São Paulo, Brazil) recognized health workers as risk group for viral hepatitis transmission. A good knowledge was observed among students from both geographical areas regarding viral hepatitis prevention. Most of them recognized the existence of vaccines against hepatitis A and B as reported by adolescents from Santa Catarina (south region of Brazil) (83.2%).[19] This situation was not observed among pediatricians attending a course in Brasilia (Mid West Region of Brazil), since none of them recommended immunization against hepatitis A and only 50% of pediatricians were vaccinated against hepatitis B.[15]

In the present study, nursing students reported that water treatment and proper sewage are important preventive measures against Hepatitis A and E while blood donors screening and condom usage were helpful for HBV and HCV prevention. An interesting finding was that less than 80% of students recognized the usage of hepatitis A vaccine for prevention, showing that most of the students only recognize the existence of hepatitis B vaccine. This situation can be explained by the inexistence of awareness campaign against these diseases, since most of the campaigns are designed for HBV or HCV. The level of viral hepatitis knowledge was higher among Rio de Janeiro students than Mato Grosso do Sul students. Possible explanations were: (i) the lowest mean age of Mato Grosso do Sul students compared to Rio de Janeiro students, (ii) the result of awareness campaigns for viral hepatitis prevention among nursing students from these regions, (iii) the presence of some disciplines in the curriculum of both institutions that can lead to a lower rate of correct answers among such nursing students.

CONCLUSION

It was concluded that all students present general good knowledge about viral hepatitis, but some gaps were observed regarding to HAV and HEV transmission by sea food ingestion, existence of HAV vaccine and 5 different hepatitis viruses, the possibility of drugs, alcohol and bacteria cause hepatitis and that people with viral hepatitis can feel nothing, and this disease can not lead to loss of movements, blood in mouth and blood in stools.

Moreover, differences regarding viral hepatitis knowledge between nursing students from Rio de Janeiro and Mato Grosso do Sul were observed, probably due to: (i) the lowest mean age of Mato Grosso do Sul students compared to Rio de Janeiro students, (ii) the result of awareness campaigns for viral hepatitis prevention among nursing students from these regions and (iii) the presence of

some disciplines in the curriculum of both institutions that can lead to a lower rate of correct answers among such nursing students.

It is necessary to intensify awareness and training strategies regarding viral hepatitis among nursing students to improve the knowledge about this topic. These strategies can be based on continuing educational intervention using internet tools, like viral hepatitis intervention programs.

ACKNOWLEDGMENTS

Authors acknowledge both institutions and volunteers to participate in this study.

REFERENCES

1. Dentinger CM. Emerging infections: hepatitis A. Am J Nurs. 2009 Aug; 109(8): 29-33.

2. Liaw YF, Brunetto MR, Hadziyannis S. The natural history of chronic HBV infection and geographical differences. Antivir Ther. 2010; 15 Suppl 3:25-33.

3. Lavanchy D. Evolving epidemiology of hepatitis C virus. Clin Microbiol Infect. 2011 Feb; 17(2): 107–15.

4. El Khouri M, Cordeiro Q, Luz DABP, Duarte LS, Gama MEA, Corbett CEP. Endemic hepatitis B and C virus infection in a brazilian eastern amazon region. Arq Gastroenterol. 2010 Jan-Mar; 47(1): 35-41.

5. Ministério da Saúde, Departamento de DST, AIDS e HEPATITES VIRAIS [Internet]. Boletim Epidemiológico de Hepatites Virais. DF: 2010 [updated 2011 Sep 1; cited 2012 Feb 12]. Available from: http://www.aids.gov.br/sites/default/files/boletim_hepatites_final.pdf.

6. Silveira L, Schiavon LL, Silva KP, Lopes TB, Zaccaron MR, Narciso-Schiavon JL. Clinical and epidemiological profile of blood donors with positive serology for viral hepatitis in southern Brazil. Rev Soc Bras Med Trop. 2011 May-June; 44 (3): 269-73.

7. Stief ACF, Martins RMB, Andrade SMO, Pompilio MA, Fernandes SM, Murat PG et al. Seroprevalence of hepatitis B virus infection and associated factors among prison inmates in state of Mato Grosso do Sul, Brazil. Rev Soc Bras Med Trop. 2010 Sept-Oct; 43 (5): 512-15.

8. Vitral CL, Gaspar AM, Souto FJ. Epidemiological pattern and mortality rates for hepatitis A in Brazil, 1980-2002--a review. - Mem Inst Oswaldo Cruz. 2006 Mar;101 (2):119-27.

9. Silva JA, Paula VS, Almeida AJ, Villar LM. Acidentes biológicos entre profissionais de saúde. Esc Anna Nery Rev Enf. 2009 July/Sept; 13(3): 508-16.

10. Oliveira AC, Gonçalves JA. Acidentes com material biológico entre os profissionais de saúde: uma análise da cobertura vacinal para hepatite B no cenário brasileiro. Rev enferm UFPE on line [Internet]. 2007 July/Sept [cited 2012 Feb 12];1(1):82-7. Available from: http://www.ufpe.br/revistaenfermagem/index.php/revista/article/view/15-9068-1-/pdf_170 doi: 10.5205/reuol.15-9068-1-LE.0101200710

11. Gaze R, Carvalho DM, Tura LFR. Informação de profissionais de saúde sobre transmissão transfusional de hepatites virais. Rev Saúde Pública. 2006 Oct; 40 (5): 859-64.

12. Pinheiro J, Zeitoune RCG. Hepatite B: Conhecimento e Medidas de Biossegurança e a Saúde do Trabalhador de Enfermagem. Esc Anna Nery Rev Enf. 2008 June; 12 (2): 258 - 64.

13. Rossi GC, Afonso PMD, Oliveira SLG, Furlan MLS. Hepatites B e C: o conhecimento dos estudantes universitários da área da saúde. Rev Enferm UERJ. 2010 Jan-Mar;18(1): 38-41.

14. Frazer K, Glacken M, Coughlan B, Staines A, Daly L. Hepatitis C virus infection in primary care: survey of registered nurses' knowledge and access to information. J Adv Nurs. 2011 Feb; 67(2): 327-39.

15. Franca R, Silva L, Melo MC, Cavalcante S, Lima B, Rocha A, et al. Pediatric Knowledge About Acute Viral Hepatitis. Braz J Infect Dis. 2004 June; 8(3):227-35

16. Cavalcanti FM, de Melo RGSV, Patrício DPS, Zimmermann RD. Hepatite B: conhecimento e vacinação entre os acadêmicos da Faculdade de Odontologia de Caruaru – PE. Odontol Clín-Cient. 2009 jan-mar; 8(1): 59-65.

17. Chao J, Chang ET, So SK. Hepatitis B and liver cancer knowledge and practices among healthcare and public health professionals in China: a cross-sectional study. BMC Public Health. 2010 Feb; 25(10):98.

18. Conte VP. Carcinoma hepatocelular. Parte 1: considerações gerais e diagnóstico. Arq Gastroenterol. 2000 Jan-Mar; 37(1): 58-67.

19. Livramento A, de Cordova CMM, Spada C, Treitinger A. Avaliação do nível de conhecimento de adolescentes a respeito da transmissão e prevenção das hepatites B e C. Rev Patol Trop. 2009; 38: 155-63.

Sources of funding: No
Conflict of interest: No
Date of first submission: 2012/01/06
Last received: 2012/03/23
Accepted: 2012/03/24
Publishing: 2012/04/01

Corresponding Address

Livia Melo Villar
Laboratório de Hepatites Virais
Instituto Oswaldo Cruz – FIOCRUZ
Pavilhão Helio e Peggy Pereira – Térreo, Sala B09
Av. Brasil, 4365 – Manguinhos
CEP: 21045900 – Rio de Janeiro (RJ), Brazil