

Article

Knowledge, Attitudes and Practices Related to Viral Hepatitis among Professionals in a Brazilian Health Foundation

Cristiane Faria Oliveira Scarponi ¹, Gabriel Souza-Silva ², Marcos Paulo Gomes Mol ³

¹ Doutora em Análises Clínicas e Toxicológicas. Pesquisadora da Fundação Ezequiel Dias (FUNED). ORCID: 0000-0002-5542-3137. E-mail: cristiane.scarponi@funed.mg.gov.br

² Doutorando Universidade Federal de Minas Gerais (UFMG). ORCID: 0000-0002-3740-4346. E-mail: silva_gs@yahoo.com

³ Doutor em Saúde e Meio Ambiente. Pesquisador da Fundação Ezequiel Dias (FUNED). ORCID: 0000-0002-2568-3579. E-mail: marcos_mol@yahoo.com.br

ABSTRACT

Awareness of viral hepatitis is a key factor for infection prevention and disease control, particularly among healthcare professionals. This study aimed to evaluate the level of knowledge, attitudes, and practices related to viral hepatitis in a Brazilian public health foundation. A self-administered questionnaire, addressing was electronically available to all professionals in December 2020. Descriptive and inferential analyses were performed using OpenEpi software. The response rate of the viral hepatitis questionnaire was 99.2%. The accuracy index for knowledge was less than 70%, encompassing basic concepts, modes of transmission, and vaccination. Most professionals reported accurate preventive attitudes, except for the decontamination of work surfaces, hygiene, and cooking of food. A high rate of unsafe actions was identified, such as unprotected sex, sharing personal objects when caring for nails, incomplete use of personal protective equipment, and incomplete vaccination. There is a general lack of awareness regarding viral hepatitis, especially among healthcare professionals. The poor understanding of risks and prevention methods has led many professionals to act imprudently or negligently. These findings provide concrete subsidies for the formulation of more effective educational actions and institutional training, given that the mere provision of information does not produce effective changes in professional behavior.

Keywords: viral hepatitis; knowledge; attitudes; practice; health education.

RESUMO

A conscientização sobre a hepatite viral é um fator chave na prevenção de novas infecções e controle desse agravo, principalmente entre os profissionais de saúde. Este estudo teve como objetivo avaliar o nível de conhecimento, atitudes e práticas relacionadas às hepatites virais em uma fundação brasileira de saúde pública. Um questionário autoaplicável foi disponibilizado eletronicamente a todos os profissionais em dezembro de 2020. As análises descritivas e inferenciais foram realizadas por meio do software OpenEpi. A taxa de resposta do questionário sobre hepatites virais foi de 99,2%. O índice de acurácia do conhecimento foi inferior a 70%, abrangendo conceitos básicos, modos de transmissão e vacinação. A maioria dos profissionais relatou atitudes preventivas corretas, exceto quando discutidos os temas descontaminação de superfícies de trabalho, higiene e cozimento de alimentos. Foi identificado alto índice de ações inseguras, como prática de sexo desprotegido, compartilhamento de objetos pessoais no cuidado das unhas, uso incompleto de equipamentos de proteção individual e vacinação incompleta. Existe uma ausência geral de sensibilização relativa às hepatites virais, observada também entre os profissionais de saúde. A má compreensão dos riscos e dos métodos de prevenção tem levado muitos profissionais a agirem de forma imprudente ou negligente. Esses achados fornecem subsídios concretos para a formulação de ações educativas e de formação institucional mais eficazes, tendo em vista que a mera prestação de informações não produz mudanças efetivas no comportamento profissional.

Palavras-chave: hepatite viral; conhecimento; atitudes; prática; educação em saúde.



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Introduction

Viral hepatitis (A, B and C) remains a persistent threat to global public health. Different virus cause these diseases, but all primarily target liver tissue. The main transmission route for hepatitis A virus (HAV) is fecal-oral. In contrast, sexual and/or parenteral exposure are the most common for hepatitis B (HBV) and C (HCV) viruses. Although less frequent, vertical transmission of HBV can still occur (Alotaibi et al. 2021; Organization. 2017). Over time, the number of cases has been increasing, with 1.34 million deaths recorded in 2015, according to the World Health Organization (Organization. 2017).

Developing effective disease control strategies is crucial to overcoming significant obstacles by 2030. One of the proposed strategies is to carry out educational interventions that cover basic concepts, viral transmission modes, and preventive actions. A good example is implementing an appropriate and up-to-date training program for health professionals, as developed by the PRAKASH Project. These measures will allow people to have greater awareness of their exposure and risk of infection, directing them towards safer conduct (Ayalew et al. 2016; Organization. 2017; Rastogi et al. 2021).

Up-to-date information on the level of knowledge, Attitudes and Practices related to viral hepatitis is desirable before starting any educational intervention (Karimi-Sari et al. 2017). Although this type of viral infection can occur in any individual, some groups are particularly vulnerable due to risk behaviors and/or exposure factors. Health professionals often are exposed to biological material while performing their occupational activities (Ayalew et al. 2016; Barbosa and Silva 2017; Roien et al. 2021). Consequently, they are more exposed to the risk of contamination by numerous infectious agents, including hepatitis virus.

Scientific evidence demonstrates that a single initial training session to transfer information about the existence of biological risks inherent to occupational activities, does not produce a sudden change in individual behavior (Ferreira et al. 2018). Health professionals need repeated educational actions owing to the high and constant occupational risk, encouraging the institutional application of biosecurity measures, including immunization strategies (Ayalew et al. 2016; Freitas et al. 2014; Rastogi et al. 2021; Roien et al. 2021). Regular training reinforces understanding of the subject, allowing conscious decision-making in both personal life and work. Thus, they will be able to perform self-care and become capable of eliminating or at least minimizing the risks to which they are routinely subjected.

The relevance of epidemiological surveys lies in identifying gaps in understanding infectious diseases in order to reduce the frequency of risk behaviors in the most vulnerable populations, mainly through health education (Ribas et al. 2018). Surveys of information on viral hepatitis and the behavioral conduct of different health professionals in everyday life are not well documented. Thus, the present study aimed to evaluate the knowledge, attitude and practices related to viral hepatitis among professionals who work in a Brazilian public health foundation.

Methods

Study design

A descriptive cross-sectional survey was conducted among professionals from a Brazilian health institution, using a questionnaire addressing topics related to viral hepatitis. The online questionnaire was built on Google Forms[®] and it was available via institutional email in December 2020. Ethical approval for this research was obtained from the Research Ethics Committee of Fundação Ezequiel Dias (CAAE: 39887420.0.0000.9507, Approval nr. 4.433.190).



Study population

The Brazilian health institution (Fundação Ezequiel Dias) that has been a reference the Minas Gerais for over 100 years, have been working in the areas of scientific research and development and production of medicines. In addition to housing the Central Laboratory of the state, it is responsible for analyses related to sanitary, epidemiological, environmental, and worker health surveillance. The sample number for this study was calculated using OpenEPI, which indicated the minimum of 116 participants for a population of 680 professionals, with an expected frequency of 10% and an acceptable margin of error of 5% for simple random sampling.

All professionals allocated to the institution regardless of academic training, area of expertise or employment relationship was established as an inclusion criterion. Express agreement with the Informed Consent Form (described in the introductory part of the electronic questionnaire) was the prerogative for study participation. Those who refused to sign the term and failed to respond to the questionnaire during the month of December 2020 were automatically excluded from the study.

Data source and analysis

A self-completed and pretested questionnaire included questions about knowledge, attitudes, and practices related to viral hepatitis. It comprises 33 multiple-choice questions divided into five sections: (I) participant profile, (II) basic knowledge, (III) forms of transmission, (IV) prevention methods, and (V) biosecurity measures in health services.

Each question had three answer options: “Yes”, “No”, and “I do not know”. A scoring system was developed based on the responses provided. Each correct answer to a question received one point. Incorrect answers or “I don't know” received no points. A sum greater than or equal to 70% of correct answers was considered satisfactory for the evaluated topic, as defined in previous studies (Soto-Salgado 2010; Islam et al 2014). Sociodemographic questions (age group, gender, education level, professional class, and work unit) were not scored.

Definitions applied to topics: Knowledge is the act of understanding, learning something through experience or reasoning; attitude is the intention to act or react motivated by an internal disposition or by a determined circumstance; practice is the realization of the act itself; carry out, execute, do from what was understood; everyday action of something. KAP concepts adapted from Machado *et al.* (2012).

Statistical analysis

The collected data were tabulated in electronic sheet and the online software OpenEpi, version 3.01 was used for statistical analysis (Sullivan, Dean, and Soe 2009). Results were presented as tables of the frequencies and distributions of the variables. The index of correct answers (sum of frequencies) was calculated by the topic. The chi-square test was used to test for significant differences between proportions. A p value < 0.05 and a 95% confidence interval were established to determine the statistical significance of the reported results.

Results

The total study population consisted of 680 professionals allocated to health institution, of whom 119 (17.2%) accessed the link to the survey, exceeding the minimum sample size. Of these, 118 agreed with the terms of participation (99.2% response rate). Among the 118 professionals, the majority of individuals 97 (82.2%) worked directly in a laboratory environment (Industrial Board; Central Laboratory; Research and Development Board).



Sociodemographic analyses of professionals showed a predominance of women (78.0%) within the age group between 31 and 40 years (44.0%), with academic training in the health area (87.8%), with a higher education level (87.8%), belonging to the pharmaceutical professional class (27.2%), and with particular allocation in the Central Laboratory (48.3%). Among these professionals, the reports cases of viral hepatitis among family members was 11.0% and of occupational accidents, involving biological material was 9.7%. Detailed sociodemographic characteristics of the respondents who participated in the study are described in Table 1.

Table 1. Sociodemographic characterization of participants (n = 118) in the survey on knowledge, attitudes and practices related to viral hepatitis, in December 2020.

Characterization of health professionals	Health professional		Non-health professional		Professionals total		χ^2
	n	%	n	%	n	%	p-value
Sex							0,17
Female	80	86.9	12	13.1	92	78.0	
Male	23	88.5	3	11.5	26	22.0	
Age group (years)							0,28
Up to 20	0	0.0	0	0.0	0	0.0	
From 21 to 30	16	100	0	0.0	16	13.6	
From 31 to 40	45	86.5	7	13.5	52	44.0	
From 41 to 50	28	87.5	4	12.5	32	27.1	
From 51 to 60	10	71.4	4	28.6	14	11.9	
Over to 60	4	100	0	0.0	4	3.4	
Scholarity							0,40
Basic education	1	100	0	0.0	1	0.8	
High school	13	92.8	1	7.2	14	11.9	
University education	89	86.4	14	13.6	103	87.3	
Professional qualification							<0,01*
Biologist	25	100	0	0.0	25	21.3	
Biomedic	9	100	0	0.0	9	7.6	
Nurse	1	100	0	0.0	1	0.8	
Pharmaceutical	32	100	0	0.0	32	27.2	
Phvsiotherapist	1	100	0	0.0	1	0.8	
Nutritionist	1	100	0	0.0	1	0.8	
Sanitarian	1	100	0	0.0	1	0.8	
Health technician	30	100	0	0.0	30	25.5	
Veterinarian	3	100	0	0.0	3	2.7	
Administrator	2	0.0	2	100	2	1.8	
Social worker	1	0.0	1	100	1	0.8	
Engineer	1	0.0	1	100	1	0.8	



Food engineer	1	0.0	1	100	1	0.8	
Psychologist	1	0.0	1	100	1	0.8	
Chemical	1	0.0	1	100	1	0.8	
Secretary	1	0.0	1	100	1	0.8	
Unprofessional	7	0.0	7	100	7	5.9	
Service location (Board)							0,45
Industrial	21	95.5	1	4.5	22	18.6	
Central Laboratory	53	92.9	4	7.1	57	48.3	
Research and Development	18	100	0	0.0	18	15.3	
Management and Finance	9	50	9	50	18	15.3	
Presidency	2	66.7	1	33.3	3	2.5	

Source: Research data

The number of correct answers related to knowledge of viral hepatitis is summarized in Table 2. The general understanding of professionals was below the ideal level of expected assertiveness (63.1%). The mean percentage scores for the domains basics, modes of transmission and vaccination were 66.0%, 73.4%, and 49.85, respectively. Questions related to vaccination had the highest percentage of mistakes and doubts (37.4%) regardless of the area of academic training.

Most professionals (83.8%) showed favorable attitudes towards protection against hepatitis B and C viruses. No significant differences were observed between the area of training and willingness to adopt preventive measures or use the necessary EPI for handling biological materials (Table 3). Among professionals with training in health, only 66.1% claimed to use all EPI in the work environment. The most common erroneous behaviors indicated by the questionnaire were not decontaminating work surfaces before and after working hours and cleaning or cooking food as a precaution against viral infections.

Table 4 presents a summary of the practices carried out by these professionals in their personal and work spheres. It was found that 78% of the professionals claimed to have had unprotected sex at some point in their lives and 45% of the women did not take their own objects (cuticle nippers, scissors, nail clippers, sandpaper, spatula, and/or orange sticks). When evaluating vaccination, good vaccination coverage for HBV (77.1%) was observed among the professionals, indicating a complete dose schedule.

Table 2. Survey of assertive responses about general knowledge related to viral hepatitis among Brazilian professionals, in December 2020.

General knowledge about viral hepatitis by topics	Correct Answers						
	Health professional		Non-health professional		Professionals total		χ^2
	n = 103	%	n = 15	%	n = 118	%	p-value
Basic notions							
Which human organ is preferentially affected by hepatitis viruses?	101	98.1	14	93.3	115	97.5	0.41
What types of viruses cause hepatitis?	49	47.6	6	40.0	55	46.6	0.39
Does a person infected with the hepatitis virus always show the symptoms of the disease?	74	71.8	7	46.7	81	68.6	0.02*
If you have already been infected with the hepatitis A virus or some other type of hepatitis, will you not be infected with	81	78,6	11	73,3	92	78,0	0,32
Is there a vaccine for which types of hepatitis viruses?	53	51.5	6	40.0	59	50.0	0.29
Is viral hepatitis a treatable disease?	88	85.4	13	86.7	101	85.6	0.06
Which of these viruses is more infectious. HBV. HCV. HIV?	52	50.5	3	20.0	55	46.6	0.03*
Is it possible to become infected with hepatitis viruses when handling blood samples?	59	57.3	3	20.0	62	52.5	0.08
What prophylaxis for post-exposure hepatitis B within the first 24 to 48 hours of the accident?	43	41.7	2	13.3	45	38.1	0.03*
Is viral hepatitis an occupational risk?	86	83.5	12	80.0	98	83.1	<0.01*0
Do you know how to proceed in case of an accident at work involving biological material?	63	61.2	6	40.0	69	58.5	0.10
Is it important to perform testing for viral hepatitis in periodic exams?	90	87.4	13	86.7	103	87.3	0.11
Mean of correct answers	69.9	67.9	8.0	53.3	77.9	66.0	0.13



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General knowledge about viral hepatitis by topics	Correct Answers						
	Health professional		Non-health professional		Professionals total		χ^2
	n = 103	%	n = 15	%	n = 118	%	p-value
Transmission modes							
Blood transfusion before the year 1993	79	76.7	11	73.3	90	0.97	0.48
Tattoos and piercings	72	69.9	12	80.0	84	0.62	0.31
Unprotected sex	95	92.2	14	93.3	109	0.71	0.35
Handshake. hug	102	99.0	15	100.	117	0.63	0.13
Shared razor/shaver	82	79.6	11	73.3	93	0.83	0.41
Breast milk/breastfeeding	42	40.8	3	20.0	45	0.21	0.10
Gnat bite	103	100.	13	86.7	116	0.02*	<0.01*
Cups. shared cutlery	94	91.3	11	73.3	105	0.10	<0.02*
Hemodialysis	49	47.6	8	53.3	57	0.68	0.44
Shared barber razor/blade	70	68.0	11	73.3	81	0.90	0.45
Shared towels. soap	103	100.	13	86.7	116	0.02*	<0.01*
Kiss/spittle	92	89.3	9	60.0	101	<0.01	<0.01*
Acupuncture. circumcision	69	67.0	8	53.3	77	0.30	0.22
toilet seats	98	95.1	15	100.	113	0.71	0.42
Organ and tissue transplantation	75	72.8	10	66.7	85	0.85	0.42
Pliers. files. spatulas. shared nail clippers	97	94.2	15	100.	112	0.86	0.37
Splash in eye. nose. mouth	72	69.9	10	66.7	82	0.96	0.48
Pipe/items for inhaling shared drugs	13	12.6	1	6.7	14	0.81	0.40
Surgical. dental procedures	88	85.4	12	80.0	100	0.87	0.43
Occupational/work accident	64	62.1	6	40.0	70	0.10	0.09
Sneezing or coughing from a sick person	95	92.2	11	73.3	106	0.07	0.03
Contaminated water/food	83	80.6	12	80.0	95	0.76	0.38



General knowledge about viral hepatitis by topics	Correct Answers						
	Health professional		Non-health professional		Professionals total		χ^2
	n = 103	%	n = 15	%	n = 118	%	p-value
Manipulate biological samples	63	61.2	10	66.7	73	0.68	0.45
Shared toothbrush	22	21.4	3	20.0	25	0.90	0.41
Syringes, shared needles	97	94.2	13	86.7	110	0.59	0.29
From mother to child during pregnancy/birth	67	65.0	9	60.0	76	0.70	0.46
Mean of correct answers	76.4	74.2	10.2	68.2	86.6	0.96	0.28
Vaccination							
Are the hepatitis vaccines given free of charge at health centers?	94	91.3	14	93.3	108	91.5	0.82
Is the vaccine the best way to prevent hepatitis C?	36	30.5	4	26.7	40	33.9	0.53
How many doses of the vaccine do you need to be immunized against hepatitis B?	58	49.2	8	53.3	66	55.9	0.83
What is the interval between doses of hepatitis B vaccine?	25	21.2	3	20.0	28	23.7	0.72
When to get a booster dose of hepatitis B vaccine?	43	36.4	9	60.0	52	44.1	0.18
Mean of correct answers	51.2	45.7	7.6	50.7	58.8	49.8	0.78
General mean of correct answers	65,8	62,6	8,6	57,4	74,4	63,1	0,78

Source: Research data


Table 3. Positive attitudes to control viral transmission reported by Brazilian professionals in December 2020.

Positive attitudes to reduce the risk of transmission of topical hepatitis viruses	Correct Answers						χ^2 p-value
	Health professional		Non-health professional		Professionals total		
	n = 103	%	n = 15	%	n = 118	%	
Adoption of preventive measures							
Avoid direct contact with bodily secretions of infected persons.	79	76.7	11	73.3	90	76.3	0.96
Use of condom or condom during sexual intercourse.	102	99.0	15	100.0	117	99.2	0.63
Use of PPE in the workplace.	80	77.7	15	100.0	95	80.5	0.16
Do not share personal objects.	77	74.8	12	80.0	89	75.4	0.90
Take care when handling sharp and/or sharp materials.	98	95.1	15	100.0	113	95.8	0.71
Decontaminate work surfaces before and after hours.	64	62.1	8	53.3	72	61.0	0.51
Have vaccinations up to date.	97	94.2	15	100.0	112	94.9	0.85
Always demand sterilized or disposable material.	93	90.3	15	100.0	108	91.5	0.72
Sanitize/cook food well.	41	39.8	8	53.3	49	41.5	0.85
Mean of correct answers	81.2	78.9	12.7	84.4	93.9	79.6	0.47
Personal safety equipment necessary for handling biological material							
Surgical mask	89	75.4	11	73.3	100	84.7	0.35
Procedure gloves	102	86.4	15	100.0	117	99.2	0.63
Apron/coat	89	75.4	13	86.7	102	86.4	0.71
Footwear	91	77.1	13	86.7	104	88.1	0.81
Goggles/face shield	99	83.9	14	93.3	113	95.8	0.85
Cap	86	72.9	11	73.3	87	73.7	0.54
Mean of correct answers	68.1	66.1	8.7	85.6	77.8	88.0	0.64
General mean of correct answers	74,7	72,5	10,7	85,0	85,8	83,8	0,79

Source: Research data


Table 4. Data on practices carried out daily by Brazilian professionals related to viral hepatitis, in December 2020.

Practices related to viral hepatitis carried out daily by topic	Correct Answers						χ^2
	Health		Non-health		Professionals		
	n = 103	%	n = 15	%	n = 118	%	p-value
Preventive measures adopted							
Do you take your own objects to the manicure?	58	56.3	6	40.0	64	54.2	0.24
Have you ever had sex without a condom?	22	21.4	4	26.7	26	22.0	0.90
Have you ever vaccinated against hepatitis A?	37	35.9	5	33.3	42	35.6	0.84
Have you ever vaccinated against hepatitis B?	89	86.4	10	66.7	103	87.3	0.05
Have you taken all the doses for hepatitis B?	81	78.6	10	66.7	91	77.1	0.30
Have you ever had a laboratory test to check your vaccine response to viral hepatitis?	65	63.1	10	66.7	75	63.6	0.79
General mean of correct answers	58.7	57.0	7.5	50.0	66.8	56.6	0.77

Source: Research data.

Discussion

One tactic to minimize viral spread is to ensure that individuals are aware of both the risks of exposure and adequate measures for infection control. This is the first survey addressing viral hepatitis in a wide range of professionals who work in the Brazilian public health foundation. The general levels of knowledge, attitudes, and practices of the health professionals were 63.1%, 83.8% and 56.6%, respectively. The results of this study indicate that the knowledge and practices reported by them are insufficient to prevent viral infections. It was even observed the report of professionals who worked in a laboratory environment already had accidents with biological materials. Additionally, 13 family members of professionals have reported cases of viral hepatitis.

These levels are similar studies conducted in Saudi Arabia, Iran and Sudan (Alotaibi et al. 2021; Mursy and Mohamed 2019; Rostamzadeh et al. 2018) Population surveys serve as indicators of retained information, as well as internal predisposition for the conscientious exercise of their work activities. Conducting research on viruses that cause hepatitis is justified since health professionals are often exposed to biological materials and sharp devices (Mustafa et al. 2019; Mursy and Mohamed 2019). The frequency of occupational accidents at studied health institution was relatively low compared with that reported with Afghanistan healthcare workers (80.1%) (Roien et al. 2021). However, this rate may be underestimated, because many professionals do not routinely report small occurrences (Konlan et al. 2017; Mursy and Mohamed 2019). Warning that confirms the need for constant updating in relation to educational actions, as knowledge about needs to be improved among professionals.

In this study, a considerable deficit of knowledge was found in relation to essential points such as basic notions, modes of viral transmission, and vaccination. The low percentage of assertiveness in understanding the viruses that cause hepatitis indicates a worrying condition, especially for professionals with training and experience in the health area. Almost half of the health professionals had doubts or reported incorrect answers about of the viruses that cause hepatitis, vaccination schemes, the risks of infection when handling biological samples, and conduct after accidental contact.

Little assimilation of concepts related to viruses that cause hepatitis was also observed in studies conducted with professionals in Saudi Arabia, India, Iran, and Vietnam (Al-Hazmi 2015; Hang Pham et al. 2019; Rastogi et al. 2021). Studies have postulated that the level of knowledge regarding viral hepatitis varies significantly among different population groups, including health professionals (Ayalew et al. 2016). Low incorporation of basic information about viral hepatitis can hinder the adoption of healthy habits and make individuals more vulnerable to infection. Similar to another study, a significant proportion of healthcare professionals were unfamiliar with accidental post-exposure procedures (Mursy and Mohamed 2019). This finding confirms the need to motivate educational actions for both health professionals and the general population (Barbosa, Salotti, and Silva 2017; Rastogi et al. 2021).

Other findings of the present study show that most professionals, regardless of their training area, are likely to have attitudes favorable to minimizing the risks of viral infection. Among the most reported incorrect thoughts were the lack of concern for decontaminating work surfaces or sanitizing or cooking food. Surprisingly, 20% of the professionals still resisted accepting institutional biosafety standards. Perception failures regarding



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the importance of completely protective clothing in a laboratory environment lead to omission in the commitment to one's own health.

The attitudes of most professionals were considered adequate to prevent viral infections, differing from a recent study conducted in Afghanistan (Roien et al. 2021). However, findings in others studied conducted in Saudi Arabia and Sudan, showed similar positive attitudes towards preventive measures for viral hepatitis (Alotaibi et al. 2021; Mursy and Mohamed 2019).

A high rate of unsafe actions (43.4%) such as unprotected sex, sharing personal objects and incomplete vaccination were identified in the present study. Considering cultural habits, it has been noticed that at great part of the Brazilian population prefers not to use condoms during sexual acts. Furthermore, many individuals inadvertently expose themselves to risk by sharing instruments for aesthetic treatment of nails in beauty salons. In contrast, more than 86.0% of professionals with training in the health area were happy to have been immunized against HBV, with a high rate of verification of the vaccine response. However, vaccination for hepatitis A has been reported by approximately one-third of all professionals.

The percentage of immunization against HBV among studied professionals was higher than that reported by institutional-based studies conducted in Kabul (56.4%) and Bauru (84.3%) (Barbosa, Salotti, and Silva 2017; Roien et al. 2021). The explanation for the high coverage obtained is that this institution made the vaccine available free of charge and required proof of immunization records from professionals working directly in the laboratory environment.

The sociodemographic characteristics of the participants in this survey are consistent with others studies in which there was a predominance of females (73.4% and 100%) and most of them had a college degree (80.9% and 72.7%) (Alotaibi et al. 2021; Mursy and Mohamed 2019). Professionals with university education demonstrated a significant association with better immunization coverage ($p < 0.01$). One of the possible explanations results from the greater number of women working in this area and take care of your own health. Additionally, the age range was similar to Saudis citizens (mean age 30.2 ± 12.1 years) and Sudan nurses and midwives (32.9 ± 11.8 years) (Alotaibi et al. 2021; Mursy and Mohamed 2019). Lack of understanding of viral transmission modes and the incorrect use of safety equipment were directly relationship ($p < 0.01$) with age group (< 40 years) in this study (Ayalew et al. 2016).

This study had some limitations. First, the answers were self-declared and therefore could not be validated. In addition, the fact that the study was based on a single Brazilian public health institution, even if it was a regional reference, does not allow it extending the findings to other institutions in the country. On the other hand, one of the strong points includes the classification of health professionals by category of academic training, seeking to cover the diversity of areas of activity within the studied foundation. The robustness of the findings of this study comes from the completeness of the answers to all questions listed. It is hoped that these findings will guide future educational actions, focusing on gaps in understanding and encouraging self-care.

In this research, focused on analyzing health professionals, it was showed that there was a lack of basic knowledge about viral hepatitis, including transmission routes and prevention measures. The high rate of mistakes and uncertainties, in some points related to vaccination and modes of transmission are relevant points to indicate the need for future institutional training. An individual's understanding of viral hepatitis is determined by retained knowledge, which often reflect on attitudes and drastically affecting the actions taken by health professionals.

The study should focus in analyze only health professionals' knowledge, attitudes and practice. Non-health professionals correspond only to 12,7% of the sample impairing the analysis, once this category does not need to exhibit the same level as required for health professionals. This data of non-health professionals is irrelevant considering the sampling.



Conclusion

There is a lack of understanding of viral hepatitis, especially among professionals trained in the health field. Despite a good awareness of preventive measures, this study indicated that many professionals possibly act with recklessly or negligently. These findings provide concrete support for the formulation of assertive educational actions and institutional training.

References

- Al-Hazmi, A. H. 2015. "Knowledge, attitudes and practice of dentists concerning the occupational risks of hepatitis B virus in Al Jouf Province, Saudi Arabia." *Niger J Clin Pract* 18 (2): 276-81. <https://doi.org/10.4103/1119-3077.151067>.
- Alotaibi, B. S., M. A. Althobaiti, A. Y. Hazazi, S. Y. Hazazi, R. A. Nassir, M. S. Alhaddad, and S. F. Abdelwahab. 2021. "Exploration of Knowledge, Attitude, and Practice Among Residents of Saudi Arabia Toward Hepatitis Viruses." *Inquiry* 58: 469580211059965. <https://doi.org/10.1177/00469580211059965>.
- Ayalew, M. B., B. A. Horssa, N. Getachew, S. Amare, and A. Getnet. 2016. "Knowledge and attitude of health care professionals regarding hepatitis B virus infection and its vaccination, University of Gondar Hospital, Ethiopia." *Hepat Med* 8: 135-142. <https://doi.org/10.2147/hmer.s120477>.
- Barbosa, Adriana Sierra Assencio Almeida, Selma Regina Axcar Salotti, and Sônia Maria Usó Ruiz Silva. 2017. "Conocimiento sobre hepatitis B, estado de vacunación y medidas de bioseguridad entre profesionales de enfermería." *Revista de Epidemiologia e Controle de Infecção* 7 (2): 107-112. <https://doi.org/10.17058/reci.v7i2.8732>. <https://online.unisc.br/seer/index.php/epidemiologia/article/view/8732>.
- Barbosa, I. A., and M. J. P.D Silva. 2017. "Nursing care by telehealth: what is the influence of distance on communication?" *Rev Bras Enferm* 70 (5): 928-934. <https://doi.org/10.1590/0034-7167-2016-0142>. <https://www.ncbi.nlm.nih.gov/pubmed/28977217>.
- Ferreira, Larissa Queiróz, Ana Carolina Oschiro, Marlene Cabral Coimbra da Cruz, Renan Paes de Camargo and Marina Coimbra da Cruz. 2018. "Hepatite B: conhecimento e atitudes de acadêmicos de Odontologia." *ARCHIVES OF HEALTH INVESTIGATION* 7 (7). <https://doi.org/10.21270/archi.v7i7.3041>. <https://archhealthinvestigation.com.br/ArcHI/article/view/3041>
- Freitas, S. Z., C. C. Soares, T. S. Tanaka, A. S. Lindenberg, S. A. Teles, M. S. Torres, F. C. Mello, M. C. Mendes-Corrêa, F. Savassi-Ribas, and A. R. Motta-Castro. 2014. "Prevalence, risk factors and genotypes of hepatitis B infection among HIV-infected patients in the State of MS, Central Brazil." *Braz J Infect Dis* 18 (5): 473-80. <https://doi.org/10.1016/j.bjid.2014.01.005>. <https://www.ncbi.nlm.nih.gov/pubmed/24662138>.
- Hang Pham, T. T., T. X. Le, D. T. Nguyen, C. M. Luu, B. D. Truong, P. D. Tran, M. Toy, S. Bozkurt, and S. So. 2019. "Knowledge, attitudes and medical practice regarding hepatitis B prevention and management among healthcare workers in Northern Vietnam." *PLoS One* 14 (10): e0223733. <https://doi.org/10.1371/journal.pone.0223733>. <https://www.ncbi.nlm.nih.gov/pubmed/31609983>.



Islam, N., Y. N. Flores, P. Ramirez, R. Bastani, and J. Salmerón. 2014. "Hepatitis and liver disease knowledge and preventive practices among health workers in Mexico: a cross-sectional study." *Int J Public Health* 59 (2): 381-94. <https://doi.org/10.1007/s00038-013-0515-9>. <https://www.ncbi.nlm.nih.gov/pubmed/24097058>.

Karimi-Sari, H., M. E. Bayatpoor, M. Aftabi Khotbesara, M. S. Ebrahimi, Z. Sattari, P. Sattari, N. Saberi Shakib, H. Taheri, S. Abdolrahim Poor Heravi, M. Dinizadeh, P. Vahed, K. Shirsavar, H. Hosseini, S. Rashvand, D. Jalaei, M. Azarafraz, M. Naderi, M. Pourzakaria, M. Firoozbakht, M. H. Khosravi, and S. M. Alavian. 2017. "Knowledge, attitude, and practice of Iranian health sciences students regarding hepatitis B and C virus infections: A national survey." *Am J Infect Control* 45 (11): e135-e141. <https://doi.org/10.1016/j.ajic.2017.07.012>. <https://www.ncbi.nlm.nih.gov/pubmed/28893448>.

Konlan, K. D., M. Aarah-Bapuah, J. M. Kombat, and G. M. Wuffele. 2017. "TOPIC: "The level of nurses' knowledge on occupational post exposure to hepatitis B infection in the Tamale metropolis, Ghana"." *BMC Health Serv Res* 17 (1): 254. <https://doi.org/10.1186/s12913-017-2182-7>.

Machado, S. P. C., Samico, I. C. and Braga, T. C. A. 2012. Knowledge, attitude and practice about phototherapy among nursing professionals of teaching hospitals. *Rev BRas Enferm*, jan-fev; 65(1): 34-41. <https://doi.org/10.1590/s0034-71672012000100005>

Mursy, S. M. M., and S. O. O. Mohamed. 2019. "Knowledge, attitude, and practice towards Hepatitis B infection among nurses and midwives in two maternity hospitals in Khartoum, Sudan." *BMC Public Health* 19 (1): 1597. <https://doi.org/10.1186/s12889-019-7982-8>.

Mustafa, R. E., S. Mushtaq, N. Akhtar, and M. A. Yameen. 2019. "Assessment of knowledge, attitude and practice towards hepatitis among patients visiting the hepatitis clinic in tertiary care hospital, Rawalpindi, Pakistan." *J Pak Med Assoc* 69 (8): 1136-1141. <https://www.ncbi.nlm.nih.gov/pubmed/31431767>.

Organization., World Health. 2017. "Global hepatitis report 2017." *WHO*: 83p. <https://doi.org/10.1186/s12889-019-7982-8>. [https://www.who.int/hepatitis/publications/global-hepatitis-report2017/en/](https://www.who.int/hepatitis/publications/global-hepatitis-report2017/en/index.html).

Rastogi, A., S. Chauhan, A. Ramalingam, M. Verma, S. Babu, S. Ahwal, and A. Bansal. 2021. "Capacity building of healthcare workers: Key step towards elimination of viral hepatitis in developing countries." *PLoS One* 16 (6): e0253539. <https://doi.org/10.1371/journal.pone.0253539>. <https://www.ncbi.nlm.nih.gov/pubmed/34166449>.

Ribas, João Luiz Coelho, Ivana Maria Saes Busato, Vera Lucia Pereira dos Santos, Ivana D. E. FranÇA Garcia, Izabelle Cristina Garcia Rodrigues, and Ana Paula Weinfurter Lima Coimbra Oliveira. 2018. "Hepatite c: uma abordagem educacional na promoção de saúde." *Revista Saúde e Desenvolvimento* 12 (10): 6 - 17. <https://www.revistasuninter.com/revistasauade/index.php/saudeDesenvolvimento/article/view/865>.

Roien, R., S. H. Mousavi, A. Ozaki, S. A. Baqeri, S. M. R. Hosseini, S. Ahmad, and S. Shrestha. 2021. "Assessment of Knowledge, Attitude, and Practice of Health-Care Workers Towards Hepatitis B Virus Prevention in Kabul, Afghanistan." *J Multidiscip Healthc* 14: 3177-3186. <https://doi.org/10.2147/jmdh.s334438>.



Rostamzadeh, M., A. Afkhamzadeh, S. Afrooz, K. Mohamadi, and M. A. Rasouli. 2018. "Dentists' knowledge, attitudes and practices regarding Hepatitis B and C and HIV/AIDS in Sanandaj, Iran." *BMC Oral Health* 18 (1): 220. <https://doi.org/10.1186/s12903-018-0685-1>. <https://www.ncbi.nlm.nih.gov/pubmed/30563497>.

Soto-Salgado, M., E. Suárez, A. P. Ortiz, S. Adrovet, E. Marrero, M. Meléndez, H. M. Colón, C. Albizu, M. Del C Santos, E. Torres, and C. M. Pérez. 2011. "Knowledge of viral hepatitis among Puerto Rican adults: implications for prevention." *J Community Health* 36 (4): 565-73. <https://doi.org/10.1007/s10900-010-9342-6>. <https://www.ncbi.nlm.nih.gov/pubmed/21125319>.

Sullivan, K. M., A. Dean, and M. M. Soe. 2009. "OpenEpi: a web-based epidemiologic and statistical calculator for public health." *Public Health Rep* 124 (3): 471-4. <https://doi.org/10.1177/003335490912400320>. <https://www.ncbi.nlm.nih.gov/pubmed/19445426>.