



EXPOSURE TO RISK FACTORS AND HEPATITIS B VACCINE AMONG STUDENTS ATTENDING PUBLIC HIGH SCHOOLS

Exposição aos fatores de risco e vacinação contra hepatite b em estudantes do ensino médio da rede pública

Exposición a los factores de riesgo y vacunación contra la hepatitis B en estudiantes de secundaria de la red pública

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ABSTRACT

Objective: To determine the frequency of high school students exposed to this viral infection and their hepatitis B immunization status. **Methods:** This is an observational and descriptive cross-sectional conducted between 2014 and 2015. A total of 1,506 questionnaires addressing sociodemographic characteristics and the main risk factors for exposure to the virus were administered. In addition, 240 vaccination records were analyzed in seven state-run schools of three municipalities in the state of Sergipe. **Results:** Participants were predominantly girls (987; 66%) and the majority was aged ≤ 16 years (773; 51%). Primary education predominated among the participants' parents (649; 43% of fathers; 758; 50% of mothers). The main risk factors to which the students were exposed included the sharing of manicure materials (656; 44%) and toothbrushes (372; 24%) and sex without a condom (281; 19%). Only 513 students (34%) did not present any risk factors. Most of the students reported having a vaccination record (1,054; 77%), but some were unaware of their own immunization status (430; 29%). Regarding the records analyzed (240), 212 students presented a full immunization status (88%). **Conclusion:** The students of public high schools of the municipalities analyzed are vulnerable to hepatitis B given the high exposure to risk factors and the hepatitis B immunization rate below the recommended by the Ministry of Health.

Descriptors: Hepatitis B; Students; Risk Factors; Vaccination.

RESUMO

Objetivo: Determinar a frequência de estudantes do ensino médio expostos à infecção viral e a situação vacinal contra hepatite B. **Métodos:** Estudo observacional descritivo transversal realizado entre os anos de 2014 e 2015. Para isso, foram aplicados 1.506 questionários, que continham questões referentes às características sociodemográficas e aos principais fatores de risco de exposição ao vírus, e analisados 240 cartões de vacina em sete colégios da rede estadual de três municípios do estado de Sergipe. **Resultados:** A maioria dos participantes era do sexo feminino (987; 66%), com idade menor ou igual a 16 anos (773; 51%) e ensino fundamental como o principal nível de escolaridade dos pais (649; 43% pai; 758; 50% mãe). Os principais fatores de risco aos quais os estudantes estão expostos compreenderam o compartilhamento de materiais de manicure (656; 44%) e de escova dental (372; 24%), bem como relação sexual sem preservativo (281; 19%). Apenas 513 alunos (34%) não apresentaram nenhum fator de risco associado. Grande parte relatou possuir o cartão de vacina (1.054; 77%), mas alguns desconhecem a própria situação vacinal (430; 29%). Ao se considerar somente os cartões analisados (240), 212 registravam o esquema vacinal completo (88%). **Conclusão:** Os estudantes do ensino médio regular da rede pública dos municípios avaliados configuram-se como vulneráveis à hepatite B, pois foi observada elevada exposição aos fatores de risco e uma taxa de imunização abaixo da preconizada pelo Ministério da Saúde.

Descritores: Hepatite B; Estudantes; Fatores de risco; Vacinação.



RESUMEN

Objetivo: Determinar la frecuencia de estudiantes de educación secundaria expuestos a infección viral y a la situación referente a la vacuna contra hepatitis B. **Métodos:** Se realizó un estudio observacional, descriptivo y transversal entre los años 2014 y 2015. Para eso fueron aplicados 1.506 cuestionarios con preguntas sobre las características socio demográficas y los principales factores de riesgo para la exposición al virus y analizados 240 tarjetas de vacuna de siete colegios de la red estadual de tres municipios del estado de Sergipe. **Resultados:** La mayoría de los participantes era del sexo femenino (n=987; 66%) con edad igual o menos de 16 años (n=773; 51%) y educación básica como el principal nivel de escolaridad de los padres (n=649; 43% padre; n=758; 50% madre). Los principales factores de riesgo para los cuales los estudiantes están expuestos fueron la acción de compartir los materiales de manicura (n=656; 44%) y de cepillo de dientes (n=372; 24%) así como tener relación sexual sin condón (n=281; 19%). Solamente 513 alumnos (34%) no presentaron factor de riesgo asociado. Gran parte relató que tenía la tarjeta de vacuna (n=1.054; 77%) pero algunos desconocen su propia situación referente a las vacunas (n=430; 29%). Considerando solamente las tarjetas analizadas (240), 212 registraban el esquema de vacuna completo (88%). **Conclusión:** Los estudiantes de la educación secundaria regular de la red pública de los municipios evaluados se caracterizan como vulnerables a la hepatitis B pues ha sido observada elevada exposición para los factores de riesgo y una tasa de inmunización por debajo de la establecida por el Ministerio de la Salud.

Descriptor: Hepatitis B; Estudiantes; Factores de Riesgo; Vacunación.

INTRODUCTION

Hepatitis caused by the B virus (HBV) is a major cause of liver disease, especially in developing countries. It is estimated that about 350 million people worldwide are chronic carriers of the virus⁽¹⁾. In Brazil, between 1999 and 2011, there were 120,343 confirmed cases of hepatitis B in the Notifiable Diseases Information System (*Sistema de Informação de Agravos de Notificação – SINAN*) – 54.2% of the cases were men⁽²⁾.

The most common form of HBV transmission is through unprotected sex, which accounts for 50% of cases, followed by the use of non-sterile and/or reused piercing instruments (injectable drugs, tattoos, manicure, outpatient, surgical and dental procedures, ear piercing and piercing) and by perinatal and intra-household contamination (sharing of toothbrush and razor blades)⁽³⁾.

Considering the forms of transmission, HBV infection can affect anyone. However, some population groups are particularly exposed to the virus because of risky behavioral habits – multiple sexual partners, unsafe sexual practices, use of injectable drugs⁽⁴⁾, piercing and tattoos⁽⁵⁾ – and occupational exposures, as in the case of health professionals and police officers⁽⁶⁾. In addition, the risk for infection seems to be more evident in less favored social contexts⁽⁷⁾ and in the age group between 15 and 39 years, with about 75% of new cases⁽⁸⁾.

In Brazil, immunization against Hepatitis B virus (HBV) began in 1989 in the municipalities of Purus, Boca do Abre and Lábrea, in the Amazon Region, in children up to ten years of age and in health professionals⁽⁶⁾. In 1998/1999, the hepatitis B vaccine was implemented for children under one year of age throughout the country. Over the years, there has been a gradual increase in the supply of the vaccine to the majority of the population, and at the beginning of 2016 it has expanded for all ages, regardless of the social and behavioral vulnerability conditions⁽⁹⁾.

Considering the analysis of the context of hepatitis B, health promotion processes should include education activities by increasing knowledge about the way the disease is transmitted, focusing on the care of potentially contaminated materials and the use of condoms in sexual relations. In addition, they should be complemented with disease prevention strategies that involve the early identification and immunization of susceptible persons.

Therefore, the present study aimed to determine the frequency of high school students exposed to this viral infection and their hepatitis B immunization status.

METHODS

This observational and descriptive cross-sectional study was carried out from September 2014 to June 2015. The target population consisted of students enrolled in regular high schools of the Regional Education Directorate (*Diretoria Regional de Educação – DRE-02*) of the municipalities of Lagarto, Riachão do Dantas, Simão Dias and Tobias Barreto, located in Sergipe, Brazil. According to information from the Sergipe State Department of Education, there were respectively 3,048, 514, 1,374 and 1,552 students enrolled in the schools of the municipalities mentioned above.

To assess the frequency of exposure to risk factors for HBV infection, 1,506 students enrolled in regular high school were selected using convenience sampling (sampling error of 5%, confidence level of 95%, estimation of 55% of students exposed to an infection risk factor, at least). Subsequently, the vaccination status was analyzed by means of the visualization

of 240 immunization records of the individuals drawn from the 1,506 participants of the previous stage (sampling error of 5%, confidence level of 95%, estimation of 80% of students with complete vaccination schedule, at least).

The methodological approach involved a data collection instrument composed of two parts: a questionnaire composed of close-ended questions related to sociodemographic characteristics (age, gender, housing and education of parents) and the main risk factors for HBV exposure described in the literature (sexual intercourse, percutaneous exposures, needle and syringe sharing, transfusion and/or transplantation) and a data extraction form for data related to the vaccination record (immunization record and number of doses of hepatitis B vaccine).

IBM SPSS Statistics 20® software was used to create the database and code the study variables. Descriptive statistics was used to obtain absolute and relative frequencies, mean, standard deviation, and minimum and maximum frequencies.

The research was carried out in accordance with the guidelines and regulatory norms recommended in Resolution 446/12 of the National Health Council and was approved by the Research Ethics Committee of the Federal University of Sergipe (*Universidade Federal de Sergipe*) under Approval No. 798.187).

RESULTS

The sample of 1,506 students enrolled in regular high schools of the public education system was composed of 66% of women (n=987), and the majority of the participants were aged ≤16 years (n=773), with a mean age of 16.1 (± 0.3 years; minimum=12 and maximum=27). Regarding housing, there was a similar distribution, with 50% being located in the rural area (n=760) and 47% in the urban area (n=701). In all, 43% of the fathers (n=649) and 50% of the mothers (n=758) had only primary education (Table I).

Table I - Sociodemographic variables of students enrolled in regular public state-run high schools (n=1,506) of Lagarto, Riachão do Dantas, Simão Dias and Tobias Barreto - Sergipe, Brazil, 2014-2015.

	City/Municipality									
	Lagarto		Riachão do Dantas		Simão Dias		Tobias Barreto		Total	
	N	%	n	%	n	%	n	%	n	%
Age										
≤ 16 years	468	52	85	46	82	69	138	45	773	51
≥ 17 years	422	47	96	52	35	30	163	54	716	48
DNR	12	1	2	2	1	1	2	1	17	1
Gender										
Women	571	63	128	70	81	69	207	68	987	66
Men	311	35	50	27	35	30	91	30	487	32
DNR.	20	2	5	3	2	1	5	2	29	2
Housing										
Urban	326	61	60	33	52	44	263	87	701	47
Rural	554	36	111	61	64	54	31	10	760	50
DNR	22	3	12	6	2	2	9	3	45	3
Father's education										
Illiterate	167	18	29	16	31	26	43	14	270	18
Primary	380	42	71	39	56	48	142	47	649	43
Secondary	192	22	32	18	12	10	61	20	297	20
Higher	48	5	19	10	2	2	26	9	95	6
DNK	107	12	26	14	17	14	29	9	179	12
DNR	8	1	6	3	0	0	2	1	16	1
Mother's education										
Illiterate	141	16	22	12	14	12	37	12	214	14
Primary	450	50	83	45	74	63	151	50	758	50
Secondary	167	19	25	13	16	13	64	21	272	18
Higher	46	5	28	15	5	4	24	8	103	7
DNK	85	9	19	10	9	8	25	8	138	9
DNR	13	1	6	3	0	0	2	1	21	2

Note: DNK (Did not know the response); DNR (Did not respond).

Source: Research data (questionnaires).

Risk factors related to HBV transmission have been well described in the literature and they include tattoos/piercing, sharing of manicure and toothbrush material, sexual intercourse without a condom, use of injectable drugs, and contact with other people's blood on a daily basis and/or by transfusion or transplantation. Table II shows that the main possible forms of students' exposure to HBV are particularly related to the sharing of manicure materials (n=656; 44%) and toothbrushes (n=372; 24%), as well as contact with blood of others in cases of wounds (n=368; 24%). In addition, a considerable proportion (n=281; 19%) of students has already been exposed to HBV and other sexually transmitted diseases (STDs), since they reported sexual intercourse without the use of a condom. On the other hand, exposure related to tattoos, piercing, blood transfusion/transplantation and use of injectable drugs was significantly reduced ($\leq 3\%$).

Table II - Risk factors for exposure to hepatitis B virus in students enrolled in regular public state-run high schools (n=1,506) of Lagarto, Riachão do Dantas, Simão Dias and Tobias Barreto - Sergipe, Brazil, 2014-2015.

	City/Municipality									
	Lagarto		Riachão do Dantas		Simão Dias		Tobias Barreto		Total	
	n	%	n	%	n	%	n	%	n	%
Tattoo										
No	863	96	176	96	116	98	291	96	1446	96
Yes	29	3	4	2	2	2	11	3	46	3
DNR	10	1	3	2	-	-	1	1	14	1
DNK	-	-	-	-	-	-	-	-	-	-
Piercing										
No	848	94	178	97	114	97	286	95	1426	95
Yes	36	4	2	1	3	2	10	3	51	3
DNR	18	2	3	2	1	1	7	2	29	2
DNK	-	-	-	-	-	-	-	-	-	-
Transfusion/Transplantation										
No	782	87	163	89	109	92	262	87	1316	87
Yes	3	1	2	1	1	1	4	1	10	1
DNR	59	6	4	3	3	4	16	5	81	5
DNK	58	6	14	7	5	3	21	7	99	7
Manicure										
Manicure service material	371	41	76	42	41	35	168	55	656	44
Own material / Does not use	491	55	99	54	77	65	118	39	785	52
DNR	20	2	4	1	-	-	12	4	35	2
DNK	20	2	4	2	-	-	5	2	30	2
Toothbrush sharing										
No	644	71	127	69	91	77	222	73	1084	72
Yes	228	25	50	27	24	20	70	23	372	24
DNR	5	1	2	2	1	1	1	1	9	1
DNK	25	2	4	3	2	2	10	3	41	3
Sexual intercourse without a condom										
No	688	76	148	81	97	82	239	79	1172	78
Yes	182	20	29	16	16	14	55	18	281	19
DNR	25	3	2	1	2	2	4	1	33	2
DNK	7	1	4	2	3	2	5	2	20	1
Use of injectable drugs										
No	880	97	180	98	115	97	290	96	1465	97
Yes	4	1	2	1	1	1	4	1	11	1
DNR	9	1	-	-	-	-	3	1	12	1
DNK	9	1	1	1	2	2	6	2	18	1
Contact with other people's blood										
No	587	65	110	60	81	69	166	55	944	63
Yes	209	23	47	26	25	21	87	29	368	24
DNR	8	1	-	-	1	1	1	1	10	1
DNK	98	11	26	14	11	9	49	15	184	12

Note: DNK (Did not know the response); DNR (Did not respond). Source: Research data (questionnaires).

Given the high rate of responses related to the risk of exposure to HBV, a cumulative analysis was carried out, that is, the frequency of one or more risk factors for HBV was verified for each participant (Table III). Only 513 students (34%) had no associated risk factors, 469 presented only one factor (31%) and 524 presented two or more factors (43%). Thus, it corroborates the analysis of risk behaviors taken by the majority of adolescents.

Table III - Cumulative risk factors for exposure to hepatitis B virus in students enrolled in regular public state-run high schools (n=1,506) of Lagarto, Riachão do Dantas, Simão Dias and Tobias Barreto - Sergipe, Brazil, 2014-2015.

Quantity of risk factors to which the individual is exposed	City/Municipality									
	Lagarto		Riachão do Dantas		Simão Dias		Tobias Barreto		Total	
	n	%	n	%	n	%	n	%	n	%
0	316	35	67	37	58	49	72	24	513	34
1	275	30	55	30	29	25	110	36	469	31
2	191	21	33	18	17	14	79	26	320	21
3	85	9	23	12	8	7	32	10	148	10
4	29	3	5	3	5	4	7	2	46	3
5	5	1	-	-	1	1	2	1	8	1
6	1	1	-	-	-	-	-	-	1	-
7	-	-	-	-	-	-	1	1	1	-
8	-	-	-	-	-	-	-	-	-	-

Source: Research data (questionnaires).

Regarding the investigation of the vaccination status (Table IV), the majority of the participants reported that they had the immunization record (n=1054; 77%) and only 873 students (58%) stated that they had been vaccinated against hepatitis B. However, when taking into consideration only the immunization records analyzed in the research (n=240), 212 presented a complete vaccination schedule (88%).

Table IV - Status of vaccination record and vaccination against hepatitis B virus reported (n=1,506) and/or visualized (n=240) among students enrolled in regular public state-run high schools (n=1,506) of Lagarto, Riachão do Dantas, Simão Dias and Tobias Barreto - Sergipe, Brazil, 2014-2015.

	City/Municipality									
	Lagarto		Riachão do Dantas		Simão Dias		Tobias Barreto		Total	
	n	%	n	%	n	%	n	%	n	%
Vaccination record (reported)										
Yes	584	64	133	73	96	81	243	81	1054	77
No	100	12	28	15	5	5	32	10	165	12
DNK	218	24	22	12	17	14	28	9	285	11
Vaccination against HBV (reported)										
Yes	633	43	94	51	55	46	91	30	873	58
No	108	12	20	11	11	9	64	21	203	13
DNK	161	45	69	38	52	44	148	49	430	29
Vaccination record (visualized)										
Yes	152	17	26	14	4	4	58	19	240	16
No	750	83	157	86	114	96	245	81	1266	84
Vaccination against HBV (visualized)										
3	147	97	25	96	3	75	37	64	212	88
2	2	1	-	-	-	-	4	7	6	2
1	-	-	1	4	-	-	7	12	8	3
-	3	2	-	-	1	25	10	17	14	7

Note: DNK. (Did not know the response). Source: Research data (questionnaires).

DISCUSSION

Most of the students in the present study were in the period of life defined by the World Health Organization as adolescence⁽¹⁰⁾. This period is characterized by rapid and diverse transformations that increase the degree of intensity of emotions and experiences. It is a period in which identity, behavior patterns and lifestyles are more definitively established. The rebelliousness and indiscipline present in adolescents (10 to 19 years old) are explained by changes that occur in neural networks in the brain during this period, i.e., neural connections are restructured in order to prepare for adult life definitively. Changes associated with the development of subcortical brain structures, immature self-regulation and hypothalamic-pituitary-adrenal axis-mediated neuroendocrine alterations are associated with increased risk behaviors⁽¹¹⁾. However, looking beyond biological alterations through a deeper analysis of the relationship of the adolescent with the health-disease process and its social determinants is of the utmost importance.

In the present study, the identification of risk behaviors in the majority of the students (66%) related to exposure to HBV and a frequency of immunization against the virus below the recommended by the Ministry of Health (88%) lead to a reflection on the social representations theory, which analyzes the processes through which individuals, in social interaction, construct explanations about social objects such as health. It is, therefore, the scientific study of common sense, which contributes to the characterization of a group identity and decision making related to risk behaviors and self-care⁽¹²⁾. Given that, research has shown that, for most adolescents, health does not mean “not getting sick”, but rather how much can be done “living good things in life” (13,14).

The scenario of risk factors for exposure to HBV among regular high school students is analyzed using the social layers model⁽¹⁵⁾. It is important to emphasize that, at the individual level, vulnerability is related to behaviors that promote risk exposure. However, such attitudes should not be understood only as voluntary actions carried out by people; they are permeated by objective conditions of the environment and cultural and social aspects⁽¹⁶⁾.

The main risk factor for exposure to HBV by students in the present study corresponded to manicure/pedicure procedures performed with materials that may be contaminated with the virus. The demand for beauty and hygiene services in this period of life is related to the perception of “body beauty” as value⁽¹⁷⁾. In order not to become excluded, many people live by improving their physical appearance even though they recognize that the media constructs models of beauty that are difficult to achieve^(18,19). In the intersectoral aspect, it is important to associate issues related to the virus biology, such as high survival, resistance and infectivity^(1,20), to the low compliance with biosafety practices in establishments, particularly with regard to the sterilization of permanent materials, such as pliers and scissors, and the disposal of consumer materials, which include nail files and wood sticks^(21, 22). In this context, it is worth mentioning the existence of studies that show the association of beauty and aesthetic services with the transmission of hepatitis B⁽²³⁻²⁵⁾.

Another risk factor for exposure to HBV that presented a significant frequency in the present study was the non-use of condoms during sexual intercourse. In Brazil, the average age at initiation of sexual life has been stabilizing since 2000 and currently ranges between 14 and 16 years⁽²⁶⁾ – the age range that covers a large part of the sample. The epidemic of Acquired Immunodeficiency Syndrome and the increase in the incidence of pregnancy in adolescence led to an increase in the use of condoms among individuals aged 16-24 years with both casual and stable partners^(26,27).

The frequency of adolescents who did not use condoms regularly varied widely according to the region of the country and research method: 54.5% in Bragança/São Paulo⁽²⁸⁾, 64% in Mato Grosso⁽²⁹⁾ and 24.1% in Teresina⁽³⁰⁾. Data from the National School Health Survey showed that 75.9% of the adolescents had used condoms in their last sexual intercourse⁽³¹⁾. The factors that mostly influence inconsistent condom use include trust in the partner based on a more stable relationship and increased emotional involvement, use of other contraceptive methods by girls (which may reflect the idea of exclusive female responsibility), partner’s choice not to use (which shows the difficulty of sexual negotiation and the relationship of power between genders), and reduction of pleasure and desire at the moment of sexual intercourse^(27,32-34). It is important to emphasize that adolescents are mainly concerned with the prevention of pregnancy, and not with STIs⁽³⁵⁾.

Regarding other types of risk, which were quite reduced in the study sample, circa 3% of the participants had piercings and/or tattoos and less than 5% had received blood transfusion/transplantation or had a history of injectable drug use. Similar results were found in other studies^(36,37).

An important aspect of the social determinants of health that should be addressed and that covers all risk factors is the lack of knowledge regarding the forms of HBV transmission, especially the transmission through percutaneous or mucosal exposure involving blood by the majority of adolescents^(30,37) and by professionals who work in beauty and hygiene services^(38,39). In addition, the main level of education of parents in the present study was primary education. It should be noted that the level of education of mothers and fathers, especially in the cases of children and adolescents, can influence access to information and encouragement of care for one’s own health⁽⁴⁰⁾.

In the case of hepatitis B, which is also a sexually transmitted disease, sex education becomes an important component in the family context. A study of 383 unmarried adolescents found that both men and women sought information about sex in friends (approximately 45%), and others (about 14%) did not talk to anyone. With regard to doubts about sexually transmitted diseases, 35% of the students sought health professionals and teachers⁽⁴¹⁾.

It is believed that teenage population has been largely neglected by mass vaccination campaigns, which may contribute to low vaccination coverage and increase the incidence of viral hepatitis in this age group^(7,42). This is reinforced by the decrease in the demand for vaccines by adolescents and young adults when the routine vaccination follow-up in Primary Health Care Centers ends – usually when the child reaches the age of five⁽⁴³⁾.

The analysis of the aspects of the HBV vaccination and immunization record showed that most of the students in the present study reported having the vaccination record and 42% said they were vaccinated. The analysis of the vaccination records of a part of the research participants (240) showed that 88% had a complete vaccination schedule. Thus, it was clear that the vaccination status in the present study is still below than the 95% coverage rate recommended by the Ministry of Health⁽³⁰⁾. Studies have shown a high resistance to vaccination in adolescents susceptible to receiving the first dose of the immunogen associated with several factors. The main reasons for such non-adherence reported were lack of guidance, fear, and disregard for the importance of the vaccine. Reasons for incomplete vaccination schedule included forgetfulness, lack of guidance on the need for 3 doses, and even unawareness of the reason⁽⁴⁴⁻⁴⁶⁾.

In addition, a reduction in care and knowledge regarding immunization was also observed – 23% of the participants reported that they did not know or did not have the vaccination record and 58% reported not being aware of their vaccination status or not being vaccinated against hepatitis B. This result corroborates another study carried out in Piauí, in which only 39.8% of the adolescents had a vaccination record and the majority were unaware of the vaccination schedule for adolescents⁽⁴⁶⁾.

In this aspect, it is important to discuss the Missed Opportunities for Vaccination (MOV), which, according to the Pan American Health Organization, occurs when a person who is a candidate for immunization and does not present contraindications goes to a health facility and does not receive the necessary vaccines⁽⁴⁷⁾. Health professionals failure to check the patient's vaccination record, among other negative attitudes, has been one of the main causes of MOV, which is in turn reflected in the vaccination coverage⁽⁴⁰⁾.

It should be noted that one of the best times to update the hepatitis B vaccination schedule is at ages 11-12. At that age, parental control is easier and facilitates adherence to multiple dose schedules; in addition, most adolescents have not started sexual life⁽⁴⁸⁾. Research also points out the school as a place that facilitates compliance with the vaccination schedule against hepatitis B⁽⁴⁵⁾.

Given the context of immunization presented herein, it is essential to plan strategies to raise adolescents' awareness of the importance of taking care of the vaccination record at the time of transition between childhood – when the mother takes care of the vaccination record and updates it – and adulthood – when they are often requested to update their vaccination schedule for entry into the labor market and higher education institutions. By doing so, they can avoid the administration of unnecessary doses of some vaccines due to lack of the card or unawareness. In addition, awareness of the importance of immunization against hepatitis B should also be raised, especially before the onset of risk behaviors associated with that age group (unprotected sexual activity, drinking, use of injectable drugs, increased concern with self-image, and search for manicure, piercing and tattoo services).

In the context of health education, the importance of considering adolescents' positive perception of health in the planning of educational practices should be highlighted. In general, these practices are based only on notions of risk and negative concepts of health and can therefore distance themselves from the real context of adolescents and represent notions of authority and imposition. Researchers emphasize the frequency of reductionist and normative approaches that are contrary to the perspective of self-care as a process of perception of the world, of interpersonal relations, of one acting towards him/herself, of one changing and transforming him/herself^(49,50). Considering these premises, health promotion and disease prevention activities should be seen as a mechanism for exchanging scientific and popular knowledge through the establishment of horizontal dialogic interactions that encourage autonomy, critical attitudes and responsible choices in daily life.

One possible limitation of this study is the bias related to students' statements – their answers may be based on idealized situations rather than concrete ones. However, a very similar relative frequency distribution is observed between the different regions studied. It is important to develop an analytical study that should consider the sociodemographic characteristics and their possible associations with the risk behaviors for HBV exposure based on the recognition of the main risk factors and vaccination status of high school students.

In addition, the school environment should also favor the identification of students susceptible to hepatitis B, the updating of the vaccination record and the implementation of health education strategies to raise adolescents' awareness of the need for immunization, both in their current life and in adulthood. Therefore, it is essential to promote educational practices to increase the knowledge about the disease and to minimize the risks of exposure to the virus, considering the social representations of this age group and the social determinants of health.

CONCLUSION

Most of the regular high school students enrolled in the public network analyzed are adolescents with sociodemographic characteristics and risk behaviors that may make them more exposed to the hepatitis B virus. Manicure procedures that do not

comply with biosafety standards stand out in the context of the analysis since more than half of the sample was composed of women.

There was also a decreased care for the vaccination record as well as a shortage of knowledge about the hepatitis B vaccination status. The rate of immunization against the disease was below that recommended by the Ministry of Health.

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REFERENCES

1. Lopes TGSL, Schinoni MI. Aspectos gerais da hepatite B. R Ci Med Biol [Internet]. 2011 [accessed on 2015 Jun 6];10(3):337-44. Available from: <http://www.portalseer.ufba.br/index.php/cmbio/article/viewFile/5899/4251>
2. Ministério da Saúde (BR). DATASUS [Internet]. Departamento de Informática do SUS [accessed on 2015 Jun 6]. Available from: <http://www2.datasus.gov.br/DATASUS/index.php?area=02>
3. Kiffer CRV, Viana GB, Cheinquer H. Hepatite B: epidemiologia. In: Focaccia R. Tratado de hepatites virais. São Paulo: Atheneu; 2002. p. 127-32.
4. Gogos CA, Fouka KP, Nikiforidis G, Avgeridis K, Sakellaropoulos G, Bassaris H, et al. Prevalence of hepatitis B and C vírus infection in the general population and selected groups in South-Western Greece. Eur J Epidemiol. 2003;18(6):51-7.
5. Hahné S, Ramsay M, Baloqun K, Edmunds WJ, Mortimer P. Incidence and routes of transmission of hepatitis B vírus in England and Wales, 1995-2000: implication for immunisation policy. J Clin Virol. 2004;29(4):211-220.
6. Amaral VC. Hepatite B: risco ocupacional. Niterói: UFF; 2005.
7. Porto SO, Cardoso DD, Queiróz DA, Rosa H, Andrade AL, Zicker F, et al. Prevalence and risk factors for HBV infection among street youth in Central Brazil. J Adolesc Health. 1994;15(7):1-5.
8. Abuassi C. Imunização em adolescentes. Rev Hosp Univers Pedro Ernesto (UERJ). 2007; 6(1):34-41.
9. Ministério da Saúde (BR), Departamento de Vigilância das Doenças Transmissíveis. Nota informativa nº 149, de 2015/ CGPNI/DEVIT/SVS/MS [Internet]. Brasília; 2015 [accessed on 2015 Jun 6]. Available from: http://www.cvpvacinas.com.br/pdf/nota_informativa_149.pdf
10. World Health Organization. Problemas de la salud de la adolescência. Informe de un comité de expertos de la OMS [Internet]. Geneva: WHO; 1965 [accessed on 2015 Jun 6]. Available from: http://apps.who.int/iris/bitstream/10665/38485/1/WHO_TRS_308_spa.pdf.
11. Santos FH, Andrade VM, Bueno OFA. Neuropsicologia hoje. 2ª ed. Porto Alegre: Artmed; 2015.
12. Jodelet D. As representações sociais. Rio de Janeiro: UERJ; 2001.
13. Cromack LMF, Bursztyn I, Tura LFR. O olhar do adolescente sobre saúde: um estudo de representações sociais. Ciênc Saúde Coletiva. 2009;14(2):627-34.
14. Ferreira MA, Alvim NAT, Teixeira MLO, Veloso RC. Saberes de adolescentes: estilo de vida e cuidado à saúde. Texto & Contexto Enferm. 2007; 16(2):217-24.
15. Dahlgren G, Whitehead M. Policies and strategies to promote social equity in health. Background document to WHO – Strategy paper for Europe. Institute for Future Studies; 1991.
16. Meyer DEE, Mello DF, Valadão MM, Ayres JCRM. “Você aprende. A gente ensina?” Interrogando relações entre educação e saúde desde a perspectiva de vulnerabilidade. Cad Saúde Pública. 2006;22(6):1335-42.
17. Assis SG, Avanci JQ, Silva CMFP, Malaquias JV, Santos NC, Oliveira RVC. A representação social do ser adolescente: um passo decisivo na promoção da saúde. Ciênc Saúde Coletiva. 2003;8(3):669-80.
18. Silva MLA, Taquette SR, Coutinho ESF. Sentidos da imagem corporal de adolescentes no ensino fundamental. Rev Saúde Pública. 2014;48(3):438-44.
19. Pavan C, Simonato P, Marini M, Mazzoleni F, Pavan L, Vindigni V. Psychopathologic aspects of body dysmorphic disorder: a literature review. Aesthetic Plast Surg. 2008;32(3):473-84.

20. Williams IT, Perz JF, Bell BP. Viral hepatitis transmission in ambulatory health care settings. *Clin Infectious Dis.* 2004; 38(11):1592-1598.
21. Melo FCA, Isolani AP. Hepatite B e C: do risco de contaminação por materiais de manicure/pedicure à prevenção. *SaBios.* 2011;6(2):72-8.
22. Oliveira FM, Alves AS, Santos LA, Santana TLS, Silva GM, Kameo SY. Adesão às medidas de biossegurança relacionada à hepatite B por manicures. *Ensaio Ciências.* 2014;18(2):83-90.
23. Johnson IL, Dwyer JJ, Rusen ID, Shanin R, Yaffe B. Survey of infection control: procedures at manicure and pedicure establishments in North York. *Can J Public Health.* 2001;92(2):134-7.
24. Hepworth J, Murtagh M. Correct procedures and cutting corners: a qualitative study of women's occupational health and safety in a beauty therapy industry. *Aust New Zealand J Public Health.* 2005;29(6):555-7.
25. Mariano A, Mele A, Tosti ME, Parlato A, Gallo G, Ragni P, et al. Role of beauty treatment in the spread of parenterally transmitted hepatitis viruses in Italy. *J Med Virol.* 2004;74(2):216-20.
26. Paiva V, Calazans G, Venturi G, Dias R. Idade e uso de preservativos na iniciação sexual de adolescentes brasileiros. *Rev Saúde Pública.* 2008;42(Supl 1):45-53.
27. Almeida MC, Aquino EM, Gaffikin L, Magnani RJ. Contraceptive use among adolescents at public schools in Brazil. *Rev Saúde Pública.* 2003;37(5):566-75.
28. Cruzeiro ALS, Souza LDM, Silva RA, Pinheiro RT, Rocha CLA, Horta BL. Comportamento sexual de risco: fatores associados ao número de parceiros sexuais e ao uso de preservativo em adolescentes. *Ciênc Saúde Coletiva.* 2010;15(Supl 1):1149-58.
29. Duarte SJH, Urel DR, Zorman IBS, Alexandre MG, Ravagnani CFC. A prática de autocuidado à saúde na perspectiva dos adolescentes. *Rev Enferm UFPE.* 2014;8(5):1290-9.
30. Araújo TME, Carvalho AMC, Monteiro RM. Análise da vulnerabilidade dos adolescentes à hepatite B em Teresina/PI. *Rev Eletrônica Enferm.* 2012;14(4):873-82.
31. Malta DC, Silva MAI, Mello FCM, Monteiro RA, Porto DL, Sardinha LMV, et al. Saúde sexual dos adolescentes segundo a Pesquisa Nacional de Saúde dos Escolares. *Rev Bras Epidemiol.* 2011;14(1):147-56.
32. Alves AS, Lopes MHB. Conhecimento, atitude e prática do uso de pílula e preservativo entre adolescentes universitários. *Rev Bras Enferm.* 2008;61(1):11-7.
33. Visser R, Smith A. Relationship between sexual partners influences rates and correlates of condom use. *AIDS Educ.* 2001;13(5):413-27.
34. Vieira MAS, Guimarães BEM, Barbosa MA, Turchi MD, Alves MFC, Seixas MSC, et al. Fatores associados ao uso do preservativo em adolescentes do Gênero feminino no município de Goiânia. *J Bras Doenças Sex Transm.* 2004;16(3):77-83.
35. Borges ALV, Schor N. Início da vida sexual na adolescência e relações de gênero: um estudo transversal em São Paulo, Brasil, 2002. *Cad Saúde Pública.* 2005;21(2):499-507.
36. Schmidt M, Middleman AB. The importance of hepatitis B vaccination among adolescents. *J Adolesc Health.* 2001;29(3):217-22.
37. Livramento A, Cordova CMM, Spada C, Treitinger A. Avaliação do nível de conhecimento de adolescentes a respeito da transmissão e prevenção das hepatites C. *Rev Patol Trop.* 2009;38(3): 155-63.
38. Oliveira ACDS, Focaccia R. Survey of hepatitis B and C infection control: procedures at manicure and pedicure facilities in São Paulo, Brazil. *Braz J Infect Dis.* 2010;14(5):502-7.
39. Hellard M, Aitken C, Mackintosh A, Ridge, Bowden S. Investigation of infection control practices and knowledge of hepatitis C among body-piercing practitioners. *Am J Infection Control.* 2003;31(4):215-20.
40. Araújo TME, Sá LC, Silva AAS, Costa JP. Cobertura vacinal e fatores relacionados à vacinação dos adolescentes residentes na área norte de Teresina/PI. *Rev Eletrônica Enferm [Internet].* 2010;12(3):502-10.
41. Borges ALV, Nichiata LYI, Schor N. Conversando sobre sexo: a rede sociofamiliar como base de promoção da saúde sexual e reprodutiva de adolescentes. *Rev Latinoam Enferm.* 2006;14(3):422-7.

42. Melo MCP, Santos MM, Mendes RNC, Sales JRP, Silva RM. Percepção de adolescentes sobre imunização em uma escola pública de Petrolina – PE. *REME Rev Min Enferm.* 2013;17(2):374-80.
43. Rodrigues IC, Fioravante IO, Kubota RMM, Furtil AP, Justino STS, Santos MR. Vacinação de escolares: estimulando o autocuidado e a responsabilização. *Arq Ciênc Saúde.* 2011;18(4):170-5.
44. Francisco PMSB, Donalisio MR, Gabriel FJO, Barros MBA. Vacinação contra hepatite B em adolescentes residentes em Campinas, São Paulo, Brasil. *Rev Bras Epidemiol.* 2015;18(3):552-67.
45. Oliveira MDS, Paggoto V, Matos MAM, Kozlowski AG, Silva NR, Junqueira ALN, et al. Análise de fatores associados à não aceitação da vacina contra hepatite B em adolescentes escolares de baixa renda. *Ciênc Saúde Coletiva.* 2007;12(5):1247-52.
46. Carvalho AMC, Araújo TME. Fatores associados à cobertura vacinal em adolescentes. *Acta Paul Enferm.* 2010 23(6):796-802.
47. Organizaci3n Panamericana de la Salud. Oportunidades perdidas de vacunaci3n em las Am3ricas: diagn3stico y intervenciones, 1988-1990 [Boletim informativo]. *PAI.* 1991;13(3).
48. Coutinho MFG. Adolesc3ncia: vacina contra hepatite B. *Adolec Sa3de.* 2010;7(1):23-30.
49. Gomes CM, Horta NC. Promoç3o da sa3de do adolescente em 3mbito escolar. *Rev APS.* 2010;13(4):486-99.
50. Bub MBC, Medrano C, Silva CD, Wink S, Per-Erik L, Santos EKA. A noç3o de cuidado de si mesmo e o conceito de autocuidado na enfermagem. *Texto & Contexto Enferm.* 2006;15(Esp):152-7.

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