

Gaps in Knowledge and Immunization Against Hepatitis B Among First-Year Medical Students

Lacunas no Conhecimento e Imunização Contra Hepatite B Entre Estudantes do Primeiro Ano de Medicina
Brechas en el Conocimiento e Inmunización Contra la Hepatitis B Entre Estudiantes de Primer Año de Medicina

RESUMO

Objetivo: Analisar o conhecimento sobre hepatite B e a cobertura vacinal entre estudantes do primeiro ano de Medicina. **Métodos:** Estudo transversal, descritivo e quantitativo, realizado com 162 estudantes de uma universidade privada de Fortaleza, Ceará. A amostra foi obtida por conveniência. Os dados foram coletados por meio de questionário estruturado, elaborado pelos autores, contendo questões sobre conhecimento e situação vacinal. A análise foi realizada por estatística descritiva. O estudo foi aprovado pelo Comitê de Ética em Pesquisa (parecer nº 6.689.258). **Resultados:** Observou-se bom conhecimento sobre aspectos básicos da doença, porém com lacunas importantes em relação às formas de transmissão e medidas preventivas. A vacinação foi amplamente reconhecida, mas menos da metade dos estudantes apresentou esquema vacinal completo. Verificou-se baixa realização de sorologia anti-HBs e discrepância entre percepção de proteção e condição imunológica. **Conclusão:** Os estudantes apresentam lacunas relevantes no conhecimento aplicado e na imunização contra hepatite B, evidenciando a necessidade de estratégias educativas precoces e contínuas na formação médica.

DESCRIPTORIOS: Hepatite B; Estudantes de Medicina; Educação Médica; Vacinação.

ABSTRACT

Objective: To analyze the level of knowledge about hepatitis B and vaccination coverage among first-year medical students. **Methods:** This is a cross-sectional, descriptive, and quantitative study conducted with 162 students from a private university in Fortaleza, Ceará, Brazil. The sample was obtained by convenience. Data were collected through a structured questionnaire developed by the authors, including questions on knowledge and vaccination status. Data was analyzed using descriptive statistics. The study was approved by the Research Ethics Committee (approval number 6,689,258). **Results:** Students demonstrated adequate knowledge of basic aspects of the disease; however, important gaps were identified regarding transmission routes and preventive measures. Vaccination was widely recognized, but fewer than half of the students had completed the full vaccination schedule. There was low adherence to anti-HBs serological testing and a discrepancy between perceived protection and actual immunological status. **Conclusion:** Students present significant gaps in applied knowledge and immunization against hepatitis B, highlighting the need for early and continuous educational strategies in medical training.

DESCRIPTORS: Hepatitis B; Medical Students; Medical Education; Vaccination.

RESUMEN

Objetivo: Analizar el conocimiento sobre la hepatitis B y la cobertura vacinal entre estudiantes de primer año de Medicina. **Métodos:** Estudio transversal, descriptivo y cuantitativo, realizado con 162 estudiantes de una universidad privada de Fortaleza, Ceará. La muestra fue obtenida por conveniencia. Los datos fueron recolectados mediante un cuestionario estructurado, elaborado por los autores, que contenía preguntas sobre el conocimiento y el estado vacinal. El análisis se realizó mediante estadística descriptiva. El estudio fue aprobado por el Comité de Ética en Investigación (dictamen nº 6.689.258). **Resultados:** Se observó un buen conocimiento sobre los aspectos básicos de la enfermedad, aunque con lagunas importantes en relación con las formas de transmisión y las medidas preventivas. La vacunación fue ampliamente reconocida, pero menos de la mitad de los estudiantes presentó un esquema vacinal completo. Se verificó una baja realiza-

ción de serología anti-HBs y una discrepancia entre la percepción de protección y la condición inmunológica. **Conclusión:** Los estudiantes presentan lagunas relevantes en el conocimiento aplicado y en la inmunización contra la hepatitis B, lo que evidencia la necesidad de estrategias educativas tempranas y continuas en la formación médica.

DESCRIPTORES: Hepatitis B; Estudiantes de Medicina; Educación Médica; Vacunación.

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INTRODUCTION

Hepatitis B is a viral infection of great relevance to global public health and is considered one of the leading causes of morbidity and mortality associated with liver diseases, such as cirrhosis and hepatocellular carcinoma. It is estimated that millions of people are infected worldwide, with universal distribution and regional variations in endemicity, reinforcing the need for effective prevention and control strategies⁽¹⁾.

The hepatitis B virus is highly transmissible, found primarily in blood and other bodily fluids, and can be transmitted through sexual contact, contact with contaminated materials, blood transfusion, and vertical transmission. Due to its high infectivity and environmental resistance, it poses a significant risk, especially in settings of occupational exposure⁽²⁾.

Among the most vulnerable groups are health care students, who, even in

the early stages of their training, may be exposed to biological materials and procedures with a risk of contamination. Practical inexperience, combined with gaps in knowledge regarding biosafety, contributes to an increased risk⁽³⁾. Studies show that, although most students report having knowledge about the disease, this knowledge is often incomplete, especially regarding modes of transmission and immunization⁽⁴⁾.

Hepatitis B vaccination is the primary preventive measure, with high efficacy in inducing immunity. However, evidence shows that adherence to the full vaccination schedule and verification of immunity through anti-HBs testing remain insufficient among students and healthcare professionals⁽⁵⁾. Furthermore, a discrepancy is observed between self-reported vaccination coverage and knowledge regarding effective protection⁽⁶⁾.

Furthermore, evidence shows that, although many students have basic

knowledge about hepatitis B, there are significant gaps in specific areas, such as modes of transmission, preventive measures, and immunization-related practices, which can negatively impact healthcare practices⁽⁷⁾.

Given this context, it is essential to assess the level of knowledge and vaccination status of medical students from the early years of their undergraduate studies in order to identify gaps in their education and inform educational strategies. Thus, the present study aims to analyze the level of knowledge about hepatitis B and vaccination coverage among first-year medical students at a private university in Fortaleza.

METHOD

This is a cross-sectional, descriptive, quantitative study conducted with first-year medical students at a private university located in Fortaleza, Ceará, Brazil.

The sample was selected by convenience, including students regularly enrolled in the first year of the program. Data collection was performed using a structured questionnaire, developed by the authors specifically for this study and administered online.

The instrument consisted of objective questions divided into two sections: (1) sociodemographic data, including gender and age; and (2) questions related to knowledge about hepatitis B, addressing aspects such as the causative agent, affected organ, modes of transmission, preventive measures, and vaccination schedule, as well as information on vaccination status and serological testing (anti-HBs).

The questionnaire was made available via the Google Forms® platform, with the invitation to participate shared among students regularly enrolled in the first year of the program. Participation was voluntary and contingent upon agreement to the Informed Consent Form (ICF).

The collected data were organized in a spreadsheet and analyzed using descriptive statistics, expressed as absolute and relative frequencies, as well as measures of central tendency when applicable.

The study was approved by the Research Ethics Committee of the University of Fortaleza (UNIFOR), under opinion no. 6,689,258, in accordance with Resolution no. 466/2012 of the National Health Council.

RESULTS

A total of 162 first-year medical students participated in the study. Female students predominated (68.5%). The participants' ages ranged from 16 to 45 years, with a mean of 20.1 years and a median of 19 years.

Knowledge of general aspects of hepatitis B: Most students demonstrated adequate knowledge of the basic aspects of the disease. Regarding

the etiological agent, 75.3% correctly identified the virus as the cause of hepatitis B, while 7.4% associated the virus with incorrect alternatives, 16.7% answered the question incorrectly, and 0.6% did not respond. Regarding the affected organ, 87.7% correctly identified the liver. Other responses included the spleen (8.0%), stomach (1.9%), pancreas (1.2%), and heart (0.6%).

Knowledge of transmission routes: Knowledge was found to be heterogeneous and incomplete. Only 29.0% of students correctly identified all the main transmission routes (sexual, blood-borne, and vertical). A significant portion of the participants demonstrated partial knowledge (42.6%); they identified only one or two correct routes without including incorrect alternatives, with 15.4% identifying only one correct route and 27.2% identifying two correct routes. In addition, 17.3% combined correct and incorrect answers, while 4.3% selected only incorrect alternatives and 1.2% did not answer.

Knowledge of prevention measures: Vaccination was widely recognized (93.2%), while condom use was mentioned by 42.6%, and 1.9% reported measures related to preventing exposure to blood or contaminated materials. Misconceptions were also observed, such as the recommendation to wear a mask (3.7%).

Knowledge about vaccination: Only 45.7% correctly answered that immunization can be administered at any age. However, 42.6% restricted vaccination to childhood, while small proportions indicated adolescence (7.4%), adulthood (1.9%), or after age 60 (1.2%).

Regarding the number of doses required for the complete vaccination schedule, only 47.5% answered correctly (three doses). A total of 34.0% stated they did not know, while 14.2%

indicated two doses, 1.9% one dose, and 1.2% four doses.

Perception of risk after vaccination: When asked about the possibility of contracting hepatitis B even after a complete vaccination schedule, 65.4% answered affirmatively, 25.9% stated they did not know, and 5.6% answered negatively.

Vaccination status and confirmation of immunity: Most students reported having received the hepatitis B vaccine (91.4%), while 8.6% stated they had not been vaccinated. Among those vaccinated, only 39.9% reported having completed the three-dose series, while 36.5% received two doses, 19.6% received one dose, and 2.0% received four or more doses. Regarding the perception of protection, 59.3% considered themselves protected against the disease, 16.7% did not know how to answer, and 6.8% did not consider themselves protected. The rate of serological testing to verify immunity (anti-HBs) was low, reported by only 11.1% of participants. The majority (69.8%) had never undergone the test, while 19.1% did not know.

DISCUSSION

The present study showed that, despite adequate knowledge of basic aspects of hepatitis B, structural gaps persist in applied knowledge and immunization among first-year medical students.

The students demonstrated good performance on conceptual content, such as the etiological agent and affected organ, which is consistent with the literature⁽⁸⁾. However, it was observed that this knowledge does not translate into adequate understanding of practical aspects, such as modes of transmission and preventive measures, indicating weaknesses in the consolidation of learning⁽⁷⁾. Similar results have been described in studies high-

lighting limitations in applied knowledge and immunization⁽⁴⁾.

Knowledge regarding transmission proved to be fragmented, with a low proportion of students able to correctly identify all routes of transmission. This finding is consistent with studies demonstrating gaps in the understanding of transmission routes among health students⁽²⁾. Given the virus's high transmissibility, this deficit represents a significant risk factor for occupational exposure⁽¹⁾. Similar results have been described in other academic populations, highlighting the persistence of these gaps throughout training⁽⁶⁾.

Regarding preventive measures, an approach centered predominantly on vaccination was observed, with less emphasis on complementary strategies. This pattern was also identified in the literature, which highlights a limited understanding of prevention practices⁽⁹⁾.

Although self-reported vaccination coverage was high, low completion of the vaccination schedule was observed, corroborating previous studies that point to failures in adherence and verification of immunity⁽¹⁰⁾. Furthermore, lack of knowledge regarding the number of doses highlights cognitive gaps related to the immunization pro-

cess. Recent studies also demonstrate a discrepancy between vaccination and effective protection⁽⁶⁾.

The discrepancy between the perception of protection and immunological confirmation is a relevant finding, as it can create a false sense of security. Low rates of anti-HBs testing are widely reported among students and healthcare professionals⁽⁵⁾. Furthermore, healthcare students are particularly vulnerable due to early exposure and lack of practical experience⁽³⁾, which underscores the importance of early educational interventions.

Overall, the findings highlight critical gaps in initial training, reinforcing the need for integration between theory, preventive practice, and occupational safety. These results have direct implications for the medical curriculum, indicating the need for more integrated pedagogical approaches.

Study Limitations

This study has some limitations that should be considered. As this is a cross-sectional study, it is not possible to establish causal relationships between the analyzed variables. Furthermore, the data were collected via a self-administered questionnaire, which may be subject to response bias, including overestimation of knowl-

edge or vaccination status. Another relevant aspect is that the study was conducted at a single educational institution, which may limit the generalizability of the results to other academic settings. Despite these limitations, the findings provide relevant information on knowledge and immunization gaps among medical students, contributing to the development of targeted educational strategies.

CONCLUSION

First-year medical students demonstrate adequate knowledge of basic aspects of hepatitis B, but with significant gaps regarding modes of transmission, preventive measures, and the vaccination schedule.

Low adherence to the full vaccination schedule and serological testing, combined with the discrepancy between perceived and actual protection, highlights vulnerability to infection.

Given this, it is necessary to implement early and continuous educational strategies, with an emphasis on integrating theoretical knowledge, preventive practices, and occupational safety, contributing to the training of better-prepared and safer professionals.

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