

**KNOWLEDGE OF HEALTH COURSE ACADEMICS ABOUT VACCINATION**  
**CONHECIMENTO DOS ACADÊMICOS DOS CURSOS DA SAÚDE ACERCA DE**  
**VACINAÇÃO**  
**CONOCIMIENTO DE ACADÉMICOS EN CURSOS DE SALUD SOBRE**  
**VACUNACIÓN**

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#### ABSTRACT

**Objective:** To analyze the factors associated with the knowledge of nursing and medical students about vaccination. **Method:** This is a descriptive and analytical, cross-sectional study carried out with nursing and medical students at a public university. Data were obtained through questionnaires with questions about demographic, academic and vaccination-related characteristics. Data were processed using the Stata 16 statistical program. **Results:** 113 students participated in this research, the majority of respondents being female, nursing students, with a predominance of age in the age group between 18 and 23 years old, and who were in the third year of course. Low knowledge of academics was pointed out, highlighting a significant association with the variables age group, academic course and years studied. **Conclusion:** It is important to emphasize the role of the university in the training of health professionals, as they lack knowledge throughout their academic training on the topic of vaccination.

**Descriptors:** Vaccination; Knowledge; Teaching.

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## RESUMO

**Objetivo:** Analisar os fatores associados ao conhecimento de acadêmicos de enfermagem e medicina acerca da vacinação. **Método:** Trata-se de um estudo descritivo e analítico, transversal, realizado com os acadêmicos dos cursos de Enfermagem e Medicina de uma universidade pública. Os dados foram obtidos através de questionários com perguntas sobre as características demográficas, acadêmicas e relacionadas ao tema vacinação. Os dados foram trabalhados no programa estatístico *Stata 16*. **Resultados:** Participaram desta pesquisa 113 estudantes, sendo maioria dos entrevistados do sexo feminino, vinculados ao curso da Enfermagem, com predomínio de idade na faixa etária entre 18 a 23 anos, e que se encontrava no terceiro ano de curso. Foi apontado baixo conhecimento dos acadêmicos, destacando-se uma associação significativa com as variáveis faixa etária, curso acadêmico e anos cursados. **Conclusão:** É importante salientar o papel da universidade na formação dos profissionais de saúde, pois os mesmos carecem de conhecimento ao longo da formação acadêmica acerca do tema vacinação.

**Descritores:** Vacinação; Conhecimento; Ensino.

## RESUMEN

**Objetivo:** Analizar los factores asociados al conocimiento de estudiantes de enfermería y medicina sobre vacunación. **Método:** Se trata de un estudio descriptivo y analítico, de corte transversal, realizado con estudiantes de enfermería y medicina de una universidad pública. Los datos se obtuvieron a través de cuestionarios con preguntas sobre características demográficas, académicas y vacunales. Los datos fueron procesados mediante el programa estadístico *Stata 16*. **Resultados:** Participaron de esta investigación 113 estudiantes, siendo la mayoría de los encuestados del sexo femenino, vinculados a la carrera de Enfermería, con predominio de la edad en el grupo etario entre 18 y 23 años, y que estaban en el tercer año, por supuesto. Se señaló bajo conocimiento académico, destacándose asociación significativa con las variables grupo etario, curso académico y años de estudio. **Conclusión:** Es importante resaltar el papel de la universidad en la formación de los profesionales de la salud, ya que estos carecen de conocimientos a lo largo de su formación académica sobre el tema de la vacunación.

**Descriptor:** Vacunación; Conocimiento; Enseñanza.

## INTRODUCTION

Brazil has great expertise in vaccination and is a reference for the scientific community in the whole world. The country is contemplated by programs that stand out in interconnected health actions to promote, protect, and prevent the Brazilian society from inidanes and aggravations. The National Program of Immunization (PNI), created in 1973, is a

strategy that places vaccination at the top level and is responsible for the immunization of the Brazilian population estimated at 211.8 million people.<sup>1</sup>

Over 40 years of the PNI, we highlight the success in the eradication of urban yellow fever, smallpox and poliomyelitis, the control of measles, neonatal and accidental tetanus, the severe forms of tuberculosis, diphtheria, and pertussis, in addition to the inclusion of the

varicela vaccine, the combined triple viral vaccine (measles, mumps, rubella) for the population one year of age.<sup>2</sup>

However, it still happens that society and health professionals do not carry knowledge that several diseases were eradicated thanks to the legacy of vaccination in Brazil and the world. Therefore, it is necessary to emphasize the importance of vaccination and strengthen the triad of scientific development, technology and human thought, so that, together, the sustainability and effectiveness of collective health can be achieved.<sup>3</sup>

Recent studies indicate that, despite the immunization caused by vaccines ensuring protection against immunopreventable diseases, the effectiveness of these immunobiologicals should be emphasized and shared as a beneficial strategy in combating agents harmful to health, which can reflect in the decrease in the number of cases of infectious diseases and avoid complications such as hospital admissions or deaths.<sup>4-6</sup>

In this context, the paper of students from the health area arises in disseminating information about the importance and effectiveness of immunization to ensure the health of the population. Meanwhile, in order for the health student to exercise his role as a contributor to the effectiveness of

primary care, it is necessary that they have a vast knowledge about immunizations, so that they can evaluate their patients correctly.<sup>5</sup>

With the increasing availability of new vaccines and the frequent updates of the vaccination calendars, keeping up to date and knowing the indications, precautions and possibility of adverse events are constant challenges for these academics.<sup>7</sup>

Although there are already studies related to the knowledge of health students about vaccination<sup>5,8,9</sup>, they are still insufficient. Moreover, we realize the importance of further in-depth research, requiring further investigation on correlated aspects that favor knowledge on the subject.

It is a fact that immunization is the safest way to protect against many diseases that have already been controlled or eradicated and, therefore, it is the role of health course students to be committed to being an integral part of this system. For this, it is necessary to have knowledge about both vaccines and immunopreventable diseases.<sup>8</sup>

Given the above, the following question was raised: What is the knowledge of health course students about vaccination? This article aims to analyze the factors associated with the knowledge

of nursing and medical students about vaccination.

## **MATERIAL AND METHODS**

This is a descriptive and analytical, cross-sectional study, of a quantitative nature, carried out with nursing and medical students from the Federal University of Maranhão, Pinheiro campus. The collection period was from September to December 2021.

The sample of students was by convenience, defining a period of 4 months for collection. A total of 113 students out of 549 enrolled participated in the research.

Inclusion criteria were defined as: students duly enrolled in their respective course and who had access to the electronic form via cell phone, tablet or computer. The exclusion criteria for the research were: students who had locked out or dropped out of the course, and those who were on health or maternity leave.

The data were obtained through questionnaires, one with closed questions about the demographic and academic characteristics of the participants, whose variables were: gender, age, course to which it is linked, and academic year. We also applied a second instrument obtained from a study carried out in Pernambuco<sup>9</sup> on the vaccination issue, which was

adapted to a reduced format to ensure greater adherence to the research.

Thus, we chose to select 20 out of 53 questions, which were answered as true or false. We selected the questions that were in accordance with the current guidelines of the manuals and vaccination schedule made available by the Ministry of Health.<sup>10</sup>

Initially, the institutional telephone and e-mail contacts of students enrolled in the courses included in the research were collected. Due to the absence of updated data in the course coordinations, some invitations were not possible to be made by telephone, because the contacts provided were non-existent or no longer belonged to the student. To those academics who agreed to participate in the research, the questionnaire and the Informed Consent Form (ICF) were sent via e-mail or WhatsApp link, according to the participant's preference.

After collection, the survey data were organized in Excel spreadsheets for the construction of tables and figures. To analyze the answers about the statements on vaccination, the following classifications were defined: 0 to 9 questions, 10 to 13 questions, 14 to 20 questions.

The data were worked with the statistical program Stata 16. We estimated absolute and relative frequencies for the variables of interest and checked their

association with knowledge about vaccination using Pearson's Chi-square or Fisher's exact test. Differences were considered significant when  $p\text{-value} \leq 0.05$ .

To meet the ethical criteria, the recommendations determined in Resolution No. 466/12 of the National Health Council were followed.<sup>11</sup> The project was forwarded to the Municipal Health Secretariat for authorization of the research in the health units. The project was also submitted to the Plataforma Brasil, for appreciation and received a favorable opinion.

The research began with an invitation to the students to participate in the study. Those who wished to participate in the study were asked to sign the

Informed Consent Form (ICF) in two copies, in which the objectives and purposes of the investigation were clarified, and the participants' anonymity was assured, as well as consent for the disclosure of the results obtained.

## **RESULTS**

A total of 113 students participated in this research, and Table 1 shows the demographic characteristics and academic profile. The highest percentage of respondents was female (63.7%), aged between 18 and 23 years (45.1%), with greater adherence to those linked to the Nursing course (67.3%), and who were in the third year of the course (46.0%).

**Table 1.** Demographic and academic characterization of students in health courses. Pinheiro-MA, Brazil, 2021.

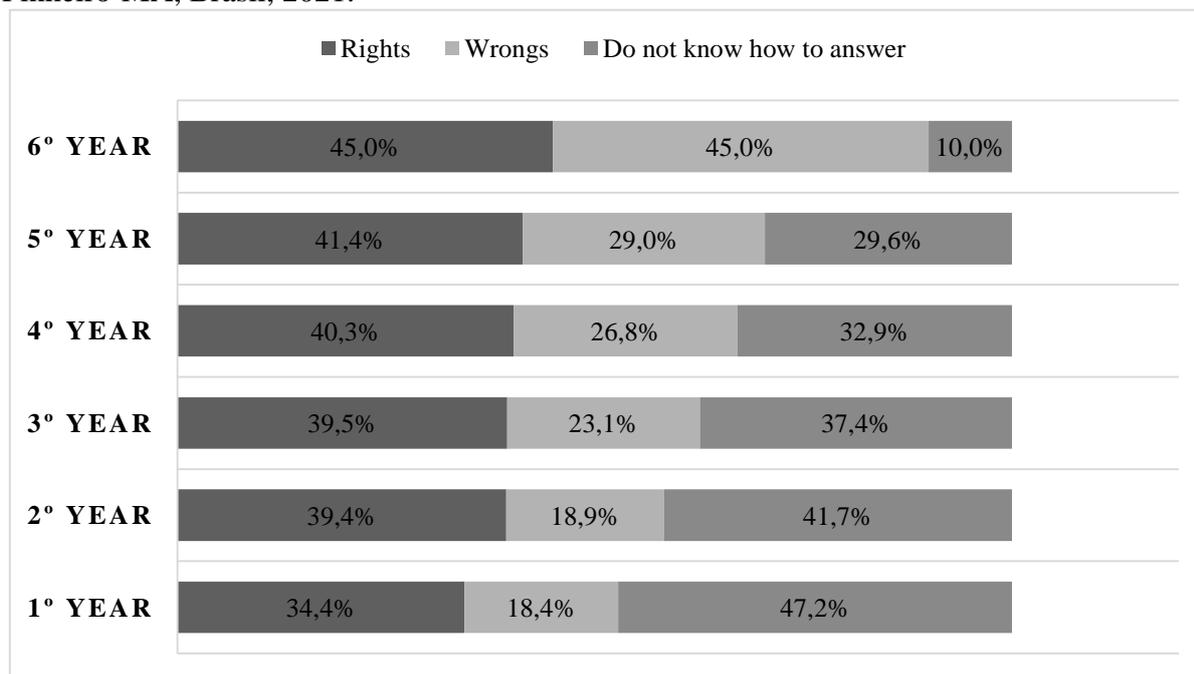
<b>Variables</b>	<b>%</b>	<b>n</b>
<b>Gender</b>		
Female	63,7	72
Male	36,3	41
<b>Age group (in years)</b>		
18 to 22 years	45,1	51
23 to 26 anos	39,8	45
> 26 years	15,1	17
<b>Course to which one is linked</b>		
Nursing	67,3	76
Medicine	32,7	37
<b>Academic year</b>		
1° year	14,2	16
2° year	8,8	10
3° year	46,0	52
4° year	16,8	19
5° year	13,3	15
6° year	0,9	1
<b>TOTAL</b>	<b>100</b>	<b>113</b>

Source: Prepared by the authors (2022)

In Figure 1, which shows the number of correct answers about vaccination per academic year, we obtained a higher percentage of both correct and incorrect answers in the 6th

year, which corresponds only to the medical course, totaling 45.0% respectively. While the first-year students of both courses could not answer 47.2% of the questions about vaccination.

**Figure 1.** Number of rights on vaccination among health academics by academic year. Pinheiro-MA, Brasil, 2021.



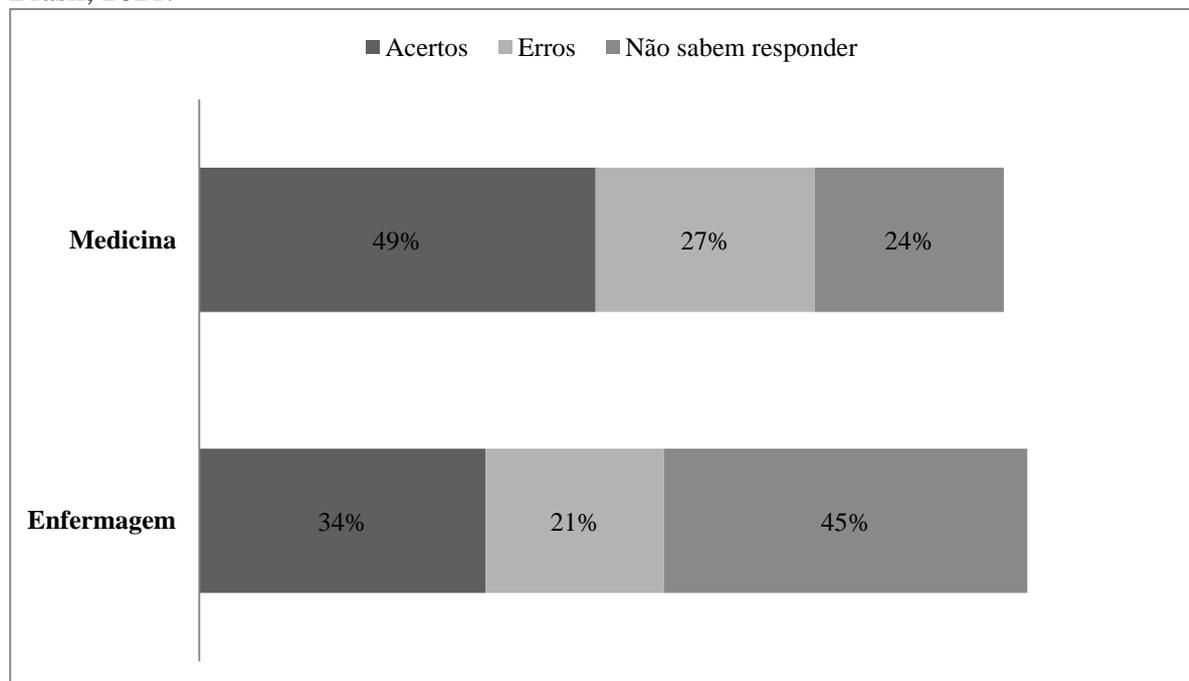
Source: Prepared by the authors (2022)

Figure 2 shows in relative values the successes, errors and the option "does not know how to respond" according to the Nursing and Medicine courses about knowledge about vaccination. Of the research participants, the most significant value of correct answers was the students of the Medicine course with 49% against

34% of the participants of the Nursing course.

In turn, another data that stands out is the percentage of those who marked the option "does not know how to answer", corresponding to 45% of the answers marked by the academics of the Nursing course, being, therefore, almost half of the answers of this group.

**Figure 2.** Number of hits of health academics on vaccination by health course. Pinheiro-MA, Brasil, 2021.



Fonte: Elaborado pelos autores (2022)

According to the p values obtained in Table 2, the attributes age group (0.007), academic course (0.035) and years of

course (0.050) are aspects that were linked to correctly answered questions about vaccination.

**Table 2.** Distribution of the number of hits on vaccination according to demographic and academic characteristics of students in health courses. Pinheiro-MA, Brasil, 2021.

Characteristics	Number of rights			<i>p</i> -valor
	≤9 questions	10-13 questions	≥14 questions	
	n (%)	n (%)	n (%)	
<b>Gender</b>				
Male	31 (39,2)	8 (32,0)	2 (22,2)	0.531*
Female	48 (60,8)	17 (68,0)	7 (77,8)	
<b>Age group (in years)</b>				
18 to 22	41 (51,9)	9 (36,0)	1 (11,1)	0.007**
23 to 27	33 (41,8)	13 (52,0)	4 (44,5)	
28 to 32	4 (5,0)	2 (8,0)	1 (11,1)	
≥33	1 (1,3)	1 (4,0)	3 (33,3)	
<b>Course</b>				
Nursing	59 (74,7)	13 (52,0)	4 (44,4)	0.035**
Medicine	20 (25,3)	12 (48,0)	5 (55,6)	
<b>Course years</b>				
1° (1° and 2° period)	13 (16,5)	1 (4,0)	2 (22,2)	0.050**
2° (3° and 4° period)	4 (5,0)	6 (24,0)	0 (0,0)	
3° (5° and 6° period)	38 (48,1)	10 (40,0)	4 (44,5)	
4° (7° and 8° period)	14 (17,8)	2 (8,0)	3 (33,3)	
5° (9° and 10° period)	9 (11,3)	6 (24,0)	0 (0,0)	
6° (11° and 12° period)	1 (1,3)	0 (0,0)	0 (0,0)	

Notes: \*Pearson Chi-square Test; \*\*Fisher Exact Test.

Source: Prepared by the authors (2022)

## DISCUSSION

This research presented the knowledge about the vaccination calendar presented by the students of Medicine and Nursing of a Higher Education Institution (HEI) in the state of Maranhão. It was

expressive the amount of answers about the lack of knowledge of the national vaccination calendar as analysis, in which it was pointed low knowledge of academics, especially when related to the variables age group, course and years studied.

The analysis allowed the observation of important points, such as the knowledge of academics of health courses on vaccines, approaches that are usually limited in the national literature to only one course. In addition, there was the possibility of comprehensive research since the answers were obtained in all the years studied. In addition, the results also contribute to the recognition of the demographic and academic profile of the research participants.

Although the data obtained showed statistically relevant results, this study presented some limitations in relation to data collection. The absence of the possibility of applying the questionnaires in a face-to-face manner is highlighted, also due to the remote mode of the activities imposed by the Sars-Cov-2 pandemic, which may contribute to response biases on the part of the participants. There was still little participation of the academics of the course of Medicine, which hindered a closer analysis of the differences between the courses. In addition, it was not possible to obtain the data of all students for the invitation to participate in the research, to the point that the disclosure occurred in a limited way.

According to the analysis, nursing students concentrated more participation than those enrolled in the medical course.

A study conducted in the state of Minas Gerais showed that nursing students recognize the importance and need for immunization and knowledge in the prevention of various communicable diseases for their professional exercise.<sup>12</sup>

Regarding the demographic variables, in relation to the prevalence of the female sex in the research being higher than the male participation, the support may be in the amount of academics in higher education is more expressive than the male quantitative in universities. The changes that have occurred in the social sphere and in work have created conditions for transformations in social relations and have shaped contemporary society.<sup>13</sup> One of the most significant examples of these changes refers to the female occupation in the labor market, its significant insertion in higher education courses and the reconfiguration of its social and family role.<sup>13</sup>

Regarding the number of correct answers about vaccination, it is demonstrated that the higher the age and year of course, the greater the degree of knowledge about vaccination in relation to the initial periods. With regard to the age group, there is a consonance with the profile found in several Brazilian universities, since the young-adult public makes up a significant portion of those enrolled, according to a survey conducted

by Agência Brasil.<sup>14</sup> It is assumed that the variable age presented association because students in final years of course are those with older age.

With regard to greater knowledge in the final periods of the courses, a similar result was found in a study carried out in a HEI of Juiz de Fora - Minas Gerais with medical students, in which, according to the evolution of the best course periods were the results on vaccine.<sup>15</sup>

In relation to knowledge per course investigated, Medicine demonstrated a greater amount of assertions compared to Nursing, but the data bring a worrying situation because no course reached even half of hits, and the number of questions that did not know how to answer was high mainly in nursing with 45%. According to these findings, the importance of continuing education in the curriculum of health courses is reinforced, especially considering the knowledge gaps in the vaccination calendar.<sup>16</sup>

Divergent from the results presented in Figure 2 of this article, a survey conducted at the University of São Paulo with students of these same courses, students of the Nursing course demonstrate superior knowledge about vaccination to students of the Medicine course. Of the 103 students interviewed, the sample says that 56% of nursing students have very

satisfactory knowledge, while medical students have 34%, respectively.<sup>8</sup>

The lack of disciplines that work more on vaccine issues may reflect the lack of knowledge, which, therefore, we observe in the numbers of results obtained. Thus, the same students who attend disciplines in which the importance of immunization can be worked, do not recognize the vaccines present in the calendar.<sup>12,17</sup>

Making a brief comparison between the curricula of the courses, the course of Medicine of this university, similar to other courses of Medicine of other institutions, has the module "Primary Care" in the first year, having worked in theory and practice related to the general panorama on the subject. This subject returns in the fifth year, at which time students enter the boarding school. In the nursing course of this institution studied, questions about the subject are addressed in the first and also in the second year, and returns in the course grid in the final years.<sup>18,19</sup>

The National Curricular Guidelines (DCNs) of Nursing, created through Resolution CNE/CES N° 3 of 11/7/2001, still in force, guide the training of nurses in line with the extended concept of health, through humanized knowledge, critical, resolute, comprehensive, and equitable.<sup>20</sup> According to the same, nurses should be

able to develop actions of prevention, promotion, protection, and rehabilitation of health, both at the individual and collective levels.<sup>21</sup> However, this guiding document, although it has modified and promoted the strengthening of undergraduate teaching in Nursing over time, in proximity to the principles and guidelines of the SUS, it presents weaknesses, opening margins for discussions aimed at its modification.<sup>20</sup>

Contrary to the Nursing DCNs, which have not been updated for more than 20 years, the guidelines of the Medicine course were recently reformulated in 2014. This restructuring brings concepts about multiprofessionality and generalist medical training, able to work in any sphere of the SUS, especially in PHC.<sup>22</sup>

However, recent studies still point out curricular characteristics far from the interprofessional care focused on the patient, still focused on clinical care and more distant from the actions of prevention and health promotion, initiatives aimed at immunization are included.<sup>22</sup>

## CONCLUSIONS

This study found that the courses of Medicine and Nursing lack knowledge throughout the academic training on the subject of vaccination. It was also possible to verify the need to update the National Curricular Guidelines of the courses of

Medicine and, above all, of Nursing, in which it needs a more current revision to contemplate important subjects such as immunization.

In addition, the study highlighted the lack of inclusion of the vaccine component throughout the course, which can directly influence the future of the academic, since these, as health professionals, are directly linked to the preventive work of preventable immune diseases.

When analyzing the knowledge of students in the health area of the university participating in this research, one notices the lack of understanding about vaccines and their attributions. Therefore, it is important to highlight the role of the university in the training of health professionals as a mediator of discussions and enabler of information aimed at improving the training of academics, implemented workshops and courses on the subject.

Furthermore, by spreading the subject ethically, the graduate should be able to address immunization issues appropriately, helping to disseminate true information regarding vaccination and its benefits, thus minimizing the circulation of fake news, which opens the way for anti-vaccine movements.

It is believed that studies that apply the forms in person can obtain more comprehensive results at sample level. We

also propose, for future studies, the investigation not only of academic knowledge, but also of myths and truths about vaccination disclosed in the media, since there is an increasing spread of false information in the digital media.

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