

Low post-liver transplant vaccine awareness: analysis and educational strategy

Baixa conscientização da vacina pós-transplante de fígado: análise e estratégia educacional
Escaso conocimiento de vacunación tras un trasplante hepático: estrategia educativa y análisis

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Abstract

Objective: To evaluate patients' and healthcare professionals' knowledge about vaccination protocols in post-liver transplantation before and after applying an educational awareness strategy in this population.

Methods: Patients (n=124) underwent the educational intervention through access to a webpage containing educational videos and, for health professionals (n=111), through a symposium and access to information on the project's virtual page. To analyze the effect of the intervention, qualitative analyses of knowledge were carried out using questionnaires before and after the interventions.

Results: Among patients, males were predominant (66.9%) and the mean age was 55.2 years old (SD + 15.9). 82.2% of patients visited a UBS to be vaccinated and 13.7% of them the CRIEs (Reference Center for Special Immunobiologicals). Only 46.7% received orientation about vaccines after liver transplantation. From the 111 questionnaires answered by health professionals, 46.5% did not check the vaccine portfolio, 61.3% referred patients to UBS and 38.7% to a CRIE. In the post-intervention analysis, 66.1% of patients watched educational videos about vaccination. Of these, 62.2% said they had improved their understanding about vaccines and 91.4% feel safer to vaccinate. After the educational intervention, 45 health professionals answered the questionnaire. 30.4% said they knew which vaccines to prescribe, and 67.4% recommended vaccines to patients' relatives.

Conclusion: The proposed educational strategy applied in this study shown to increase awareness regarding the post-liver transplant immunization protocols. This may contribute to avoiding the potential risk of lack of information and failure to address vaccination by healthcare professionals.

Resumo

Objetivo: Avaliar o conhecimento de pacientes e profissionais de saúde sobre os protocolos de vacinação no pós-transplante hepático antes e após a aplicação de uma estratégia educativa de conscientização nessa população.

Métodos: Os pacientes (n=124) foram submetidos à intervenção educativa através do acesso a uma página web com vídeos educativos e, para os profissionais de saúde (n=111), através de um simpósio e acesso à informação na página virtual do projeto. Para analisar o efeito da intervenção, análises qualitativas de conhecimento foram realizadas por meio de questionários antes e depois das intervenções.

Resultados: Entre os pacientes, predominou o sexo masculino (66,9%) e a média de idade foi de 55,2 anos (DP + 15,9). 82,2% dos pacientes procuraram uma UBS para serem vacinados e 13,7% deles, os CRIEs (Centro de Referência para Imunobiológicos Especiais). Apenas 46,7% receberam orientações sobre vacinas após o transplante hepático. Dos 111 questionários respondidos pelos profissionais de saúde, 46,5% não

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consultaram a carteira de vacinas, 61,3% encaminharam os pacientes para UBS e 38,7%, para um CRIE. Na análise pós-intervenção, 66,1% dos pacientes assistiram a vídeos educativos sobre vacinação. Destes, 62,2% disseram ter melhorado seu entendimento sobre as vacinas e 91,4% se sentem mais seguros para vacinar. Após a intervenção educativa, 45 profissionais de saúde responderam ao questionário. 30,4% afirmaram saber quais vacinas prescrever e 67,4% indicaram vacinas para familiares de pacientes.

Conclusão: A estratégia educacional proposta aplicada neste estudo mostrou aumentar a conscientização sobre os protocolos de imunização pós-transplante hepático. Isso pode contribuir para evitar o risco potencial de falta de informação e não abordagem da vacinação pelos profissionais de saúde.

Resumen

Objetivo: Evaluar los conocimientos de pacientes y profesionales de la salud sobre protocolos de vacunación tras un trasplante hepático, antes y después de aplicar una estrategia educativa de sensibilización en esta población.

Métodos: Los pacientes (n=124) fueron sometidos a la intervención educativa mediante el acceso a un sitio web con videos educativos, y los profesionales de la salud (n=11), mediante un simposio y el acceso a información en la página web del proyecto. Para analizar el efecto de la intervención, se realizaron análisis cualitativos de conocimiento con cuestionarios antes y después de la intervención.

Resultados: Entre los pacientes, el sexo masculino fue predominante (66,9 %) y la edad promedio fue 52,2 años (SD + 15,9). El 82,2 % de los pacientes fue a una Unidad Básica de Salud (UBS) para recibir la vacuna y el 13,7 % de ellos acudió a un Centro de Referencia para Inmunobiológicos Especiales (CRIE). Solo el 46,7 % recibió instrucciones sobre vacunación tras el trasplante hepático. De los 111 cuestionarios respondidos por profesionales de la salud, el 46,5 % no consultó el catálogo de vacunas, el 61,3 % derivó a los pacientes a una UBS y el 38,7 % a un CRIE. En el análisis posintervención, el 66,1 % de los pacientes miró los videos educativos sobre vacunación. De ellos, el 62,2 % mencionó haber mejorado su comprensión sobre vacunas y el 91,4 % se sintió más seguro para vacunarse. Después de la intervención educativa, 45 profesionales de la salud respondieron el cuestionario. El 30,4 % afirmó saber qué vacunas prescribir y el 67,4 % recomendó vacunas a familiares de los pacientes.

Conclusión: La estrategia educativa propuesta aplicada en este estudio demostró un aumento de conocimiento sobre los protocolos de inmunización tras un trasplante hepático. Esto puede ayudar a evitar el riesgo potencial de la falta de información y el no abordar el tema de la vacunación por parte de los profesionales de la salud.

Introduction

Liver transplantation is the only curative treatment for patients with end-stage liver disease. Such patients with this indication invariably present a diagnosis of decompensated liver cirrhosis, others related to the emergence of hepatocellular carcinoma (HCC) within the Milan Criteria, and even emergency cases, without previous liver disease, characterized as acute liver failure.^(1,2)

Post-transplant patients have an increased susceptibility to a variety of infections due to the immunosuppressive condition. Current guidelines recommend routine immunization in the pre-transplant period, not only because of the need to prevent infections in the post-transplant period but also due to the impossibility of applying some types of vaccines after the procedure, such as, for example, vaccines composed of attenuated viruses.^(3,4) Given the particularities of the immunization strategy in the pre- and post-transplantation period, many doubts are common among the healthcare team responsible for the care of these patients, as well as the patients themselves. Studies suggest that the major cause of vaccine failure in post-transplant patients is the belief by the caregivers that these vaccines will

not be effective and may cause acute and chronic graft rejection.⁽⁵⁾

In 1993, the Brazilian Health Ministry, through the National Immunization Program (NIP), created the Special Immunobiological Reference Centers (CRIEs) to provide certain immunobiological agents to special categories of the population.⁽⁴⁾ Brazil offers one of the world's most complete free vaccination schedules, available in primary care, through Unidades Básicas de Saúde (Basic Health Units), or through CRIEs.^(3,4)

New vaccines have been added to the vaccination calendar of these patients since the publication of the Vaccination Manual for Solid Organ Transplant Recipients in 2004.⁽⁶⁾ The awareness of the vaccination protocol, as well as frequent orientation is essential for patients to have access to such immunization strategy properly according to the national protocols in force. The low availability of information to this population about the importance of vaccination, and the few resources related to the continuing education of health professionals, deprive the correct referral of these patients. They may not only be deprived of vaccination, or even subjected to those contraindicated at this stage, increasing the risk related to its unintended administration.^(7,8)

Based on the aforementioned issues, this study proposes to verify the vaccination status of post-liver transplant patients as well as the knowledge of healthcare professionals and patients about immunization protocols. Furthermore, the impact of an educational strategy on the knowledge of the groups will be evaluated, concerning the inclusion of vaccines as a preventive measure for infectious complications.

Methods

This longitudinal, experimental, prospective study with convenience sampling evaluated two groups, (1) post-liver transplant patients (n=124) and (2) healthcare professionals (n=111). Such groups were assessed at two study time frames: (1) assessment of baseline knowledge about vaccination and (2) assessment of knowledge gain post-educational intervention specific to each group.

The initial evaluation according to the group was performed as follows:

1. Post-liver transplant patients by telephone call through a standardized questionnaire, when the awareness of this population about vaccination was verified;
2. Health professionals through the application of a standardized questionnaire via Google Forms platform addressed the knowledge of this population about the adequacy of the vaccination status of immunosuppressed patients and the perception of the importance of immunization in the post-transplantation period.

After the administration of the questionnaires to health professionals and patients, the groups were submitted to two processes of educational intervention: synchronous virtual seminar about indication and orientation of immunization, as well as the availability of an electronic platform with educational strategies for patients and health professionals.

The platform was developed by the Production Engineering research group of the Polytechnic School of the University of São Paulo. It presented educational content and didactic videos for pa-

tients, and the information included instructions on which vaccines they can receive and when they should be updated, the main adverse effects, and a control schedule for their use. The videos were developed in a didactic format, easy to understand for the lay population, using the VideoScribe® platform.

The healthcare team was provided with information on vaccine-related risks, risk groups, and suitability according to the stage (pre and post-transplant), as well as specific dosing and control strategies. Access to the information was available to the public through an e-mail address provided to the participants and directed to the page developed specifically for this study by the research group.

After the educational intervention phase was completed, questionnaires were applied again to verify knowledge acquisition after the educational strategies described above.

The study design was divided into three phases: (I) diagnosis of the knowledge of health professionals and patients - verification of the adequacy of the vaccine protocol in the post-transplant period; (II) educational intervention - lectures and availability of electronic platforms for access; (III) verification of knowledge acquisition of patients and health professionals through a second phase questionnaire (Figure 1).

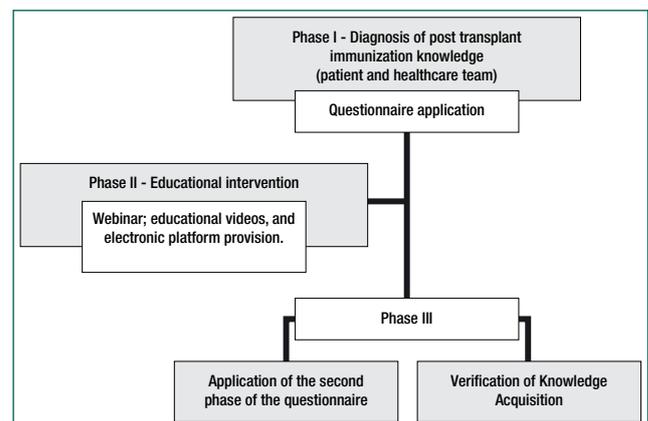


Figure 1. Flowchart of the study phases

The study was conducted in the Liver Transplantation Outpatient Clinics of Hospital São Paulo of the Universidade Federal de São Paulo and Hospital de Transplante do Estado de São Paulo.

Post-liver transplant patients who are being followed up in the Liver Transplantation Outpatient Clinics of Hospital São Paulo of the Universidade Federal de São Paulo and Hospital de Transplante do Estado de São Paulo were voluntarily interviewed by telephone, through a convenience sample. Health professionals (multiprofessional team, among doctors and nurses) directly involved in the care process of the transplanted patients were also evaluated, through an electronic questionnaire applied through the electronic platform Google Forms.

The healthcare team was invited to answer an electronic questionnaire to obtain data on awareness of immunization only to check the knowledge of the professionals, without specific individual interventions. An informed Consent Form was also requested for the professionals involved.

Adults (≥ 18 years old) of both genders, undergoing liver transplantation and being followed up were included in this study.

Exclusion criteria were individuals without cultural or intellectual conditions to understand the consent process and who did not have a caregiver capable of accompanying them, as well as those patients who refused to sign the ICF.

Two groups were considered for this study, (1) post-liver transplant patients ($n=124$) and (2) healthcare professionals ($n=111$).

Data collection was carried out using two questionnaires, available through the Google Forms platform, from January to December 2020, including the following topics: demographic data, vaccination status pre-liver transplantation, and vaccination status post-liver transplantation. A second questionnaire was directed to the medical staff of health professionals to assess the knowledge about the vaccine recommendation to the post-liver transplant patient and the prescription of vaccines during the outpatient follow-up of the post-transplant patient.

To analyze the effect of the intervention, qualitative analyses of knowledge were carried out using questionnaires before and after the interventions.

This study was developed after approval by the Research Ethics Committee of the

Universidade Federal de São Paulo (protocol number 4.012.979/2019). All participants in this study signed an Informed Consent Form (ICF).

Results

From the total eligible population (220 post-liver transplants), 142 patients (64.5%) were selected. The main causes for non-inclusion are presented in Figure 2.

Of these 124 post-liver transplant patients, males predominated (66.9%), the mean age was 55.2 years old (SD + 15.9). Patients usually sought basic health units to be vaccinated (82.2% of the cases) and only 13.7% of them sought CRIEs. Furthermore, 82.2% of all patients confirm that they are usually approached to be vaccinated during public campaigns. The graph shows the knowledge about vaccination divided between the study groups (Figure 3).

To assess how immunization guidelines are followed by patients, we investigated how they deal with issues related to the documents usually required to be vaccinated or to prove a previous vaccination shot (here called vaccination card). Among all patients, 73.9% reported having the vaccination document, however, 34% knew how to find it if needed. Surprisingly, only 42.7% of the patients remembered being asked about this document by the liver transplant team, and most of this request (57.2%) was not made by the physician.

Among the patients in our study, only 46.7% received information about vaccination before liver transplantation and 62.1% after liver transplantation. Of all patients who received liver transplantation, 3% reported that they do not take vaccines despite the recommendation of health professionals and 76.6% of patients received some dose of vaccines after liver transplantation.

The assessment of education about vaccination guidelines was also evaluated in this group. Only 49% of patients knew that there are vaccines not recommended for their immunosuppressed status, 43% informed about liver transplantation before receiving any type of vaccination dose. In

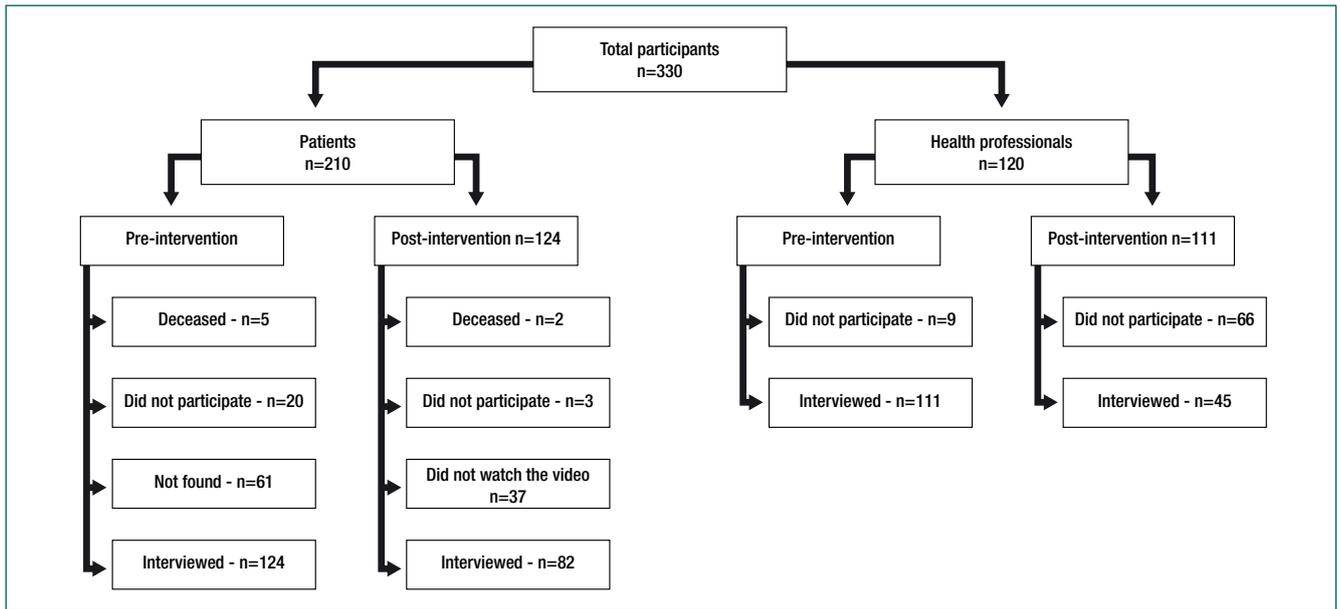


Figure 2. Study participants recruited on a voluntary basis

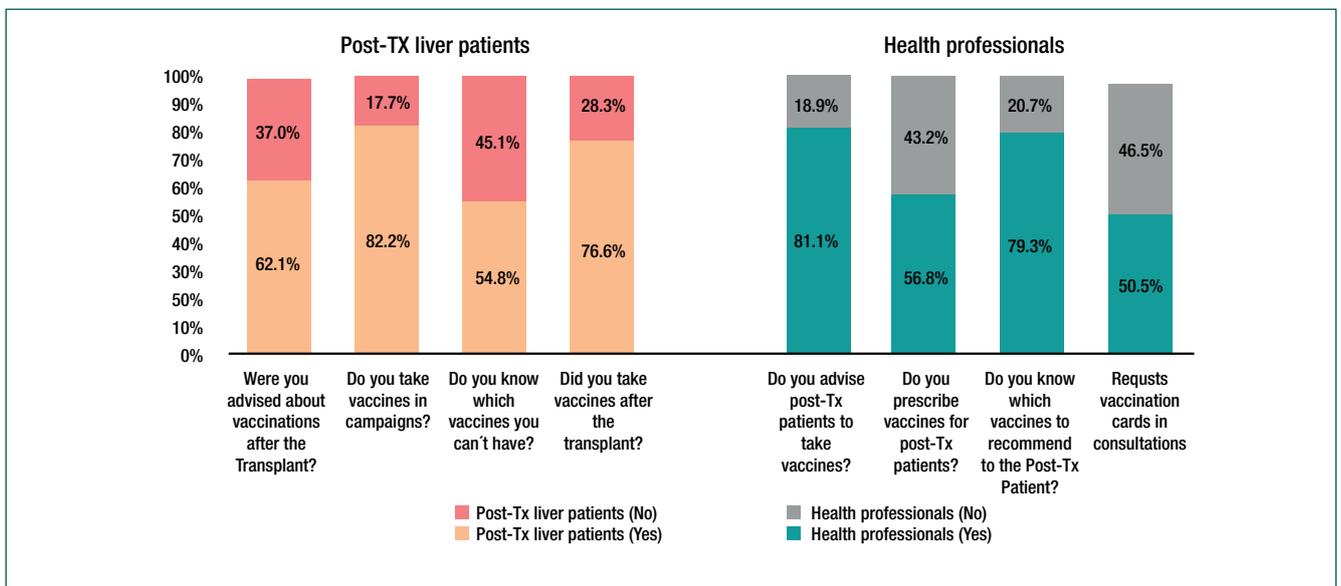


Figure 3. Graph on knowledge regarding the vaccination protocol among patients and health professionals

addition, 40% knew about the vaccination protocol for adults and only 31.5% were aware about special vaccination recommendations for immunosuppressed patients. Only 19% of the patients knew superficially or had already been informed about what CRIEs are.

During the current study, an educational intervention was carried out through open information on the website <https://vacinas-transplante.herokuapp.com/> and also educational videos with

a short, practical and easy-to-understand guide on the main topics related to vaccination. Out of all the patients interviewed in the first part of our survey, 66.1% watched these videos, and 62.2% said that their understanding about the vaccination issued improved afterwards. In addition, 91.4% felt more comfortable with vaccination safety after this education program, and 68.2% would like to continue to receive more information about their health condition.

Among the health professionals, 111 forms were filled out, 72.1% were female. Of these, 80.2% were physicians and 11.7% were nurses. Although 79.3% of all health professionals claimed to know which vaccines should be prescribed for these patients, only 50.5% of them request the vaccination document in the routine evaluation and 81.1% give vaccination guidance for liver transplant patients. In addition, 56.8% provide in writing the prescription of the recommended vaccine doses and 61.3% recommend their relatives and contacts to be vaccinated as well. Health professionals usually recommend their patients to be vaccinated at the basic health units, which can be explained by the fact that only 49.5% of them reported having knowledge about the special immunization programs available at the CRIEs for this population.

Discussion

This study aimed to evaluate the diagnostic knowledge of the vaccination status and knowledge about the immunization schedule for patients undergoing liver transplantation and health professionals linked to the treatment of this group. Our study showed that knowledge about vaccination is not broad among transplanted patients and not always reinforced by health professionals. We observed a percentage gain in knowledge after the intervention and education in both groups. Although it is not possible to evaluate the impact of the intervention with the proposed study design.

Immunization should be understood as a modifier in the course of diseases, since they show a marked decrease in morbidity and mortality caused by vaccine-preventable infectious diseases. It represents the lowest cost and most effective procedure, which ensures health promotion and protection in vaccinated individuals.⁽⁹⁾

Although there is a National Policy for Continuing Education from the Health Ministry (BR),^(10,11) the study showed how frequent is the low knowledge about immunization among patients, where 54.8% reported not knowing which vaccine they cannot take and 71.1% of health

professionals do not check the vaccination status of the patient through the vaccination card, reinforcing the importance of further studies on this topic. Continuing education is a strategy that incorporates teaching and learning into the daily life of organizations and into social and labor practices in the actual context in which they occur, since it is based on meaningful learning and the possibility of transforming professional practices.⁽¹¹⁾ Although our study presented a proposal for an educational intervention, in the present design, only one moment of intervention was considered. The group believes that strategies that include continued education for patients and health professionals may have greater long-term benefit and warrant further investigation in the future.

Healthcare professionals are the most important link of information source for vaccination. The lack of information about vaccination was one of the reasons reported by 51.6% of the study patients before transplantation and 37.1% after liver transplantation, justifying the insecurity on the part of these patients in updating their vaccination status. It is known in the literature that the advice of these professionals is one of the predictors in immunization, leading to the hypothesis of the negative impact of this routine non-guidance. Inadequate knowledge of vaccination advantages among healthcare workers may have substantial negative effects on vaccination coverage in post-transplant patients. Primary care providers play a central role in educating patients about the safety and efficacy of vaccines recommended by health authorities, and may positively influence immunization rates.⁽¹²⁾

In the current study, which assessed the perception of healthcare professionals and patients about post-transplant immunization, 20.7% had no information about the vaccines that could be recommended for post-transplant patients. These patients are part of a specific group that must be carefully monitored. The recommendations for the use of immunizations for candidates and recipients of solid organ transplantation were included in the 2004 American Society for Transplantation Guidelines.⁽¹³⁾ The main core of these guidelines was that vaccination history should be reviewed early in

the transplant evaluation process and that a strategy to update and track immunizations should be created and regularly reviewed during the pre-transplant waiting period.⁽¹³⁾

The data presented in this study alert to the serious problem of information for the group of patients and the lack of education in vaccination programs carried out by health professionals. From the forms evaluated 79.3% of the health professionals knew which vaccines should be applied in post-liver transplant patients, while only 50.5% requested the vaccination cards. These findings corroborate with studies conducted in the United States where there are specific courses on vaccination for health professionals in training. The knowledge about vaccines, attitudes and strategies were fundamental for health professionals to know how to provide immunization advice to transplanted patients.^(15, 18,19)

Given the scenario enforced by the SARS-COV-2 (COVID-19) pandemic, it is of utmost importance the understanding and adequacy of the vaccination scheme for patients undergoing solid organ transplantation. Studies have shown that immunosuppressed patients benefit from COVID-19 vaccination and should be immunized according to the recommendations of the Centers for Disease Control and Prevention in the United States (CDC).⁽²⁰⁾ Due to a rapidly changing perspective on vaccines worldwide, there was a need for a revised consensus statement in the context of vaccination in solid organ transplant (SOT) recipients, vaccination of liver transplant (LT) recipients has been recommended by professional societies.^(15,20,21) Recently, several studies evaluating the efficacy of the COVID-19 vaccine in transplant patients have shown a reduced risk of infections among those who received the vaccine compared to no vaccination, which makes us believe that our study contributes to encourage new and diverse educational and awareness strategies about the importance of vaccination in this population. It is important to recognize that vaccination may still prevent many infections or reduce the severity of infection.^(14,16,17)

The educational strategies adopted in the study suggest they are effective. Although the study design does not allow evaluation of statistical gain

between the two moments of intervention. Of the 66.1% of patients who watched the videos, 91.4% felt safer to take vaccines after the intervention. We identified that these education policies should be routinely implemented, especially about immunization and even more in immunosuppressed patients, as described in other studies, which show the clear need to adopt strategies to reverse the reduction in vaccination coverage, in addition to paying attention to the factors that contribute to this situation.

It was noted in the study that there is no major resistance by patients to vaccination, what is missing is the routine recommendation by health professionals about the importance and safety of vaccination in this group.

It was observed that simple and easily accessible educational strategies can contribute to the gaining of knowledge in all spheres of care, from the patient to the professional seeking a global approach from all the main actors in the vaccination process. Future initiatives to promote education, as well as increased training of healthcare professionals, particularly physicians, are needed and should be included in postgraduate curricula and continuing professional development. Education strategies must be provided to both groups to improve vaccination adherence, impacting on better health care and quality of life for transplant patients in Brazil.

Conclusion

This study provided important and useful information about the current educational situation and immunization protocol for liver transplant patients in Brazil and alerted to the potential risk of lack of patient information and health care professionals' knowledge.

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Collaborations

Miranda MN, Ribeiro SP, Chaves FC, Costa e Telles FM, Gonzalez AM, Mota DO and Pimentel CFMG contributed to the design of the study and were involved in the data collection, data analysis and/or interpretation. All authors also contributed to manuscript writing/substantive editing and review and approved the final draft of the manuscript.

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