

Knowledge of dentists about Human Teeth Bank

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ABSTRACT

Human teeth bank (HTB) is a non-profit organization which purpose is to receive, store, catalog and maintain human teeth for student research and pre-clinical laboratorial training. However, many dentists are unaware of the importance of a HTB. Therefore, the objective of this study was to evaluate the knowledge of dentists from Basic Health Units in Teresina (PI) city about their behaviors related to HTB. It was performed an observational study with stratified probabilistic sampling and proportional allocation using interviews. More than half of the dentists reported to know about the existence of HTBs in Brazil, but 81% did not know about it at Federal University of Piauí (UFPI). All interviewees were in favor of the donation and considered the tooth as an organ. However, 95.2% had never donated teeth to a HTB. Trash was the most common teeth destination after exodontia. Therefore, it is possible to conclude that there is no donation of human teeth by the dentists interviewed, possibly due to the lack of knowledge about the existence of the UFPI's HTB and its peculiarities.

Descriptors: Tooth. Ethics. Tissue and organ procurement.

1 INTRODUCTION

The Human Teeth Bank (HTB) is a non-profit organization that aims to meet teaching and research needs. The HTB stores and keeps

extracted teeth in good conservation, respecting ethical and legal rules for dental organ donation¹.

Thus, the creation of the HTB in Dentistry courses legalizes the use of teeth for academic and research purposes. Moreover, HTB can

direct their collection in accordance with current country laws².

In Brazil, the standardization of the HTB follows the Resolution 441/11 of the National Health Council and the Transplantation Law of 1997, which recognized the teeth as human body's organs³⁻⁵. The legislation provides for a penalty of 3 to 8 year-sentence, and a fine for removing *post mortem* organs, tissues and parts of the human body from an unidentified person^{4,5}. However, there is still no law that contemplates this theme for teaching and extension purposes, since that legislation refers only to research². Therefore, the HTB aims to stimulate teeth donation, as well as its legalization in order to inhibit illegal trade^{2,6}.

The ethical standards non-compliance turns the teeth manipulation into a potential risk to cross infection, since periodontal and pulp tissues have salivary and blood pathogens⁷. Thus, for purposes that involves research, laboratory training, epidemiological studies calibration, and teaching^{6,7}, it is recommended to use Personal Protective Equipment (PPE), Hepatitis B vaccination and protocols for human teeth sterilization/disinfection⁷. However, the choice of the extracted teeth sterilization method can cause structural changes in the enamel and dentin⁸. Due to the lack of an ideal method, studies are looking for favorable results in materials that combine antimicrobial efficacy and structural preservation of the dental substrate.

Therefore, the present study aimed to evaluate the knowledge of Basic Health Units (BHU) dentists from Teresina (PI) on various HTB-related behaviors. From the obtained data, it will be possible to elaborate strategies for encouraging teeth donation, as well as to

aware professionals about the importance of the HTB for academic training and research.

2 METHODS

This study was approved by the Research Ethics Committee of the Federal University of Piauí (UFPI) (protocol #1.872.436.) The participants were informed about the research objectives and signed a free and informed consent form, in compliance with the Resolution of the National Health Council NHC No 466/12.

This is a cross-sectional observational study conducted with dentists inserted in the Family Health Strategy from BHU located in the Teresina city (PI). A published questionnaire⁷ was applied through an interview performed by a previously trained undergraduate student in a pilot study. Information about knowledge, objectives, ethical, legal and biosecurity aspects related to HTB were collected.

The sample was established by stratified sampling with proportional to health regional allocation (chart 1). For this sample calculation, the 95% confidence interval⁹ and data referring to the response rate (yes = 94% or no = 6%) of the questionnaire applied by Pinto et al., 2009⁷ were used. The BHU were drawn until reach the needed sample number for each regional.

Chart 1. Distribution of dentists in each health regional.

| Location of the Regional | Population of dentists | Sample (n) |
|--------------------------|------------------------|------------|
| South | 71 | 20 |
| East/Southeast | 80 | 22 |
| North | 76 | 21 |
| Total | 227 | 63 |

Data were analyzed in the Statistical Package for Social Science (SPSS®, version 20.0, for Windows, SPSS Inc., Chicago, IL, USA). A descriptive analysis of the investigated variables was performed with absolute values and percentages.

3 RESULTS

Regarding gender, 60.3% (n = 38) of the participants in this study were female, while 39.7% (n = 25) were male.

According to table 1, more than half (66%) of dentists were aware of the existence of HTB in Brazil. On the other hand, 81% did not know about UFPI's HTB. All interviewees recognized the risk of cross-infection during the human teeth manipulation. Despite that, 23.8% handled

teeth without PPE use.

Regarding teeth donation to a HTB, 95.2% of respondents had never performed donation. However, 66.7% stated that they had already been requested for teeth donation for laboratorial or research purposes. According to the study, 90.5% would donate their own teeth to the HTB (table 1).

When asked about teeth storage and disinfection, 34.9% stored them, but only 31.7% disinfected them (table 2).

Regarding the final teeth destination procedures after extraction, various answers were obtained. The most dentists reported to discard human teeth in the trash or give them back to the patients (graph 1).

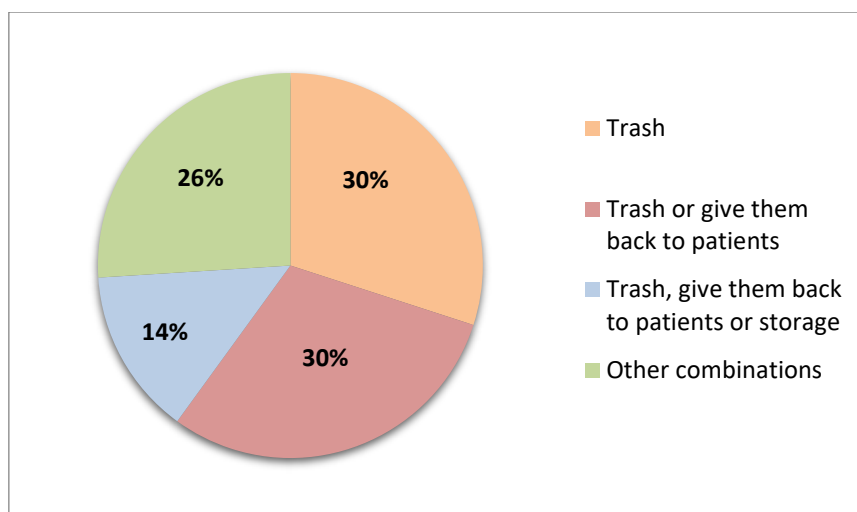
Table 1. Knowledge of Basic Health Units' dentists from Teresina (PI) about HTB ethical, legal and biosafety.

| Questions | Yes (%) | No (%) |
|--|------------|------------|
| Do you know about the existence of HTBs? | 42 (66%) | 21 (33%) |
| Do you know that the UFPI has a HTB? | 12 (19%) | 51 (81%) |
| Have you ever donated teeth to a HTB? | 3 (4.8%) | 60 (95.2%) |
| Do you agree with organ donation? | 63 (100%) | - |
| Do you consider the tooth as an organ? | 63 (100%) | - |
| Do you inform patients that the tooth is an organ and it is under the Transplantation law? | 14 (22.2%) | 49 (77.8%) |
| Have you ever manipulated teeth without using PPE? | 15 (23.8%) | 48 (76.8%) |
| Did you know that in the pulp and periodontal tissues there may be blood pathogens communicable to the professional? | 63 (100%) | - |
| Have you ever been requested for donating teeth to be used in laboratories and research? | 42 (66.7%) | 21 (33.3%) |
| Would you donate your own teeth to a HTB? | 57 (90.5%) | 6 (9.5%) |

Table 2. Teeth disinfection performed by dentists of Basic Health Units in Teresina (PI).

| Questions | Yes | No |
|---|-------|-------|
| Do you store teeth? | 34.9% | 65.1% |
| If so, do you perform teeth disinfection before storage them? | 31.7% | 3.2% |

Graph 1. Teresina (PI) dentists' procedures regarding the final destination given to teeth after exodontia performed in the Basic Health Units.



4 DISCUSSION

The presence of HTB in dentistry courses is due to the need for biological management, storage or discard of the extracted teeth used in undergraduate students' disciplines and research¹⁰. Thus, it is important to consider the dental element as a functional and integral organ of the stomatognathic system¹¹.

In the present study, most professionals reported to know about the existence of HTB in Brazil. However, they did not know about the UFPI's HTB, as well as its conducts and activities. The same was reported in the study performed by Pinto et al., 2009¹². Previous studies attribute this fact to the recent linkage of the HTB to dental

schools¹²⁻¹⁴.

All interviewees reported being in favor of organ donation, in addition to consider the tooth as an organ as previously showed by Pinto et al., 2009¹². However, the information given to patients about the Brazilian Transplantation law was neglected. Also, it is noteworthy that many of the questioned professionals have practiced ethical and legal failures regarding the extracted teeth destination.

When asked about the request for teeth to scientific and laboratorial purposes, the interviewees stated that they had already been approached in this sense. For Freitas et al.¹⁴, this organ is still little valued by researchers. Many

teeth are used in laboratory studies, violating ethical and legal principles.

The illegal trade of extracted human teeth is considered a crime¹⁵. The Article 15 of the Brazilian Criminal Code establishes punishment from 3 to 8 year-sentence for those who buy or sell tissues, organs or parts of the human body^{4,5}. According to the Dentistry Ethical Code, the non-compliance with the laws that regulate the use of organs is considered an ethical infraction, being able to determine penalties that vary from warning to the cassation of the legal exercise of the profession.

Regarding knowledge and biosafety behaviors, all respondents stated that they knew the risk of contamination through communicable blood pathogens. However, they neglected to use PPE during teeth handling. For Moreira et al.¹³ and Dominici et al.⁶, the use of PPE and tooth disinfection reduces the risk of cross-infection, emphasizing the importance of a HTB. On the other hand, the way in which teeth storage and disinfection can influence the properties of their tissues. Materials such as formaldehyde, sodium hypochlorite, ethanol and glutaraldehyde may alter the permeability and adhesive strength of the dentin^{16,17}. The UFPI's HTB recommended storage protocol is the use of distilled water in a refrigerated closed bottle, weekly changed. The sterilization technique will be applied according to the purpose of its use by the student or researcher, being autoclave the most applied method.

Regarding the destination given to the teeth after exodontia, most respondents stated to discard teeth in the trash or give them back to the patient. Such attitudes can be explained by the lack of knowledge about the UFPI's HTB existence and activities. In addition, the non-knowledge about the 306/2004 ANVISA Resolution¹⁸, and the 358/200519 CONAMA could also be involved. These regimentations deal about technical aspects that regulate the management of Health Services

Wastes (HSW), contradicting the attitude of delivering the extracted tooth to the patient.

At the questionnaire elaboration, the item 'discarded in the trash' specified handling conduct: segregation, storage and final destination. The 306/2004 ANVISA Resolution considers that health services are responsible for the correct management of all HSW generated by them, following legal norms and requirements from its generation to its discard. Each generator must prepare a plan for management of Health Services Wastes, based on the characteristics of the generated waste and the constant classification contained in the resolution, establishing the management guidelines.

Dental residues included in the A4 Group (organs or tissues from surgical procedures or anatomopathological studies or diagnostic confirmation) must be sent packed into appropriate containers without previous treatment to a licensed place, in order to perform final HSW discard. The non-compliance of this Resolution, supervised by the National Environmental System (SISNAMA), will cause legal penalties and sanctions to the violator, mainly regarding the Law 9605 of February 12, 1998 and its regulated decree.

The UFPI's HTB was created in September 2006, by the 151/06 Resolution of the Teaching, Research and Extension Council (Process #23111.010340/04-11). The non-donation of extracted teeth to the UFPI's HTB could be explained by the lack of information about its existence. In this context, it is responsibility of the institution to prepare documents informing the Resolution and procedures for donation. The ideal for cases in which one or more dental extraction are performed is to obtain patients' authorization for donation and to inform them about the HTB purposes and aims. After their acceptance, it is necessary to fill out a free and informed consent form explaining the entire process for donating¹⁸. The function of a HTB is to facilitate the donation,

taking care about their origin and destination²⁰.

Regarding the possibility of donating an own tooth, dentists positively answered, which corroborated with an earlier study¹². It is noteworthy that in the present study, it was not considered the time or degree of training (general practitioner or specialist) of professionals.

Despite of the limitations, it is expected that this study may result in clarifying attitudes to professionals and patients, improving the quality of knowledge about tooth donation to HTB, and health care waste management. The official donation of teeth enables new research and combats the illegal trade of teeth in the academic environment. Thus, a specific recycling is proposed through explanatory lectures and other activities by the municipal manager to the dentists, inserting the University and Regional Council of Odontology in these actions.

5 CONCLUSION

It was concluded that there is no donation of human teeth by the BHU dentists from Teresina (PI), possibly due to the lack of knowledge about the UFPI's HTB, being the trash the main final destination of teeth.

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RESUMO

Conhecimento dos cirurgiões-dentistas sobre Banco de Dentes Humanos

Banco de dentes humanos (BDH) é uma entidade sem fins lucrativos que tem a finalidade de recepcionar, armazenar, catalogar e manter em boa conservação dentes humanos para pesquisa e treinamento laboratorial pré-clínico de estudantes. No entanto, muitos cirurgiões-dentistas desconhecem a importância do BDH. O

objetivo deste estudo foi avaliar o conhecimento dos cirurgiões-dentistas das Unidades Básicas de Saúde (UBS) do município de Teresina/PI sobre condutas diversas relacionadas aos BDHs. O presente estudo é do tipo observacional com amostragem probabilística estratificada com alocação proporcional, que utilizou entrevistas. Mais da metade dos cirurgiões-dentistas afirmaram ter conhecimento da existência de BDHs no Brasil, porém 81% desconheciam a existência do BDH da Universidade Federal do Piauí (UFPI). Todos os entrevistados foram a favor da doação e consideram o dente como um órgão, entretanto 95,2% nunca fez doação de dentes para um BDH. O lixo foi o destino mais comum após exodontias. Diante disto, foi possível concluir que não há doação de dentes humanos pelos cirurgiões-dentistas entrevistados, possível-mente, devido ao desconhecimento da existência do BDH da UFPI e suas peculiaridades.

Descritores: Dente. Ética. Obtenção de Tecidos e Órgãos.

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