**KNOWLEDGE OF TEACHER AND DENTISTRY STUDENTS OF A BRAZILIAN UNIVERSITY ABOUT A HUMAN TEETH BANK**

l.a.r., VALADAS 1, l.s., ANDRADE.1, f.f.c., SILVA1, j.f., MACEDO 1, l.s., PINHEIRO1, p.l.d., LOBO 2, f.j., GIRAO JUNIOR 1, l.m.b., MENEZES 1

1 Pharmacy, Dentistry and Nursing College, Federal University of Ceara, Fortaleza-CE-Brazil.

2 Dentistry College- Campus of Sobral, Federal University of Ceara, Fortaleza-CE-Brazil.

∗ Corresponding author: Francisco Josimar Girão Júnior

Dentistry College - 1210 Capitao Francisco Pedro, Federal University of Ceara, Fortaleza- CE-Brazil.

Telefone: +55 88 999241251

E-mail: [josimarjunior77@gmail.com](mailto:josimarjunior77@gmail.com)

**KNOWLEDGE OF TEACHER AND DENTISTRY STUDENTS OF A BRAZILIAN UNIVERSITY ABOUT HUMAN TEETH BANKS**

**ABSTRACT**

Human Tooth Banks (HTB) tries to overbear academic activities by providing human teeth, which are fundamental for preclinical, clinical and experimental applications. This study, which took place at UFC, considered the cognition of students and professors of Dentistry on HTB. **Aims:** The study aimed at the investigation of the reality and importance of this tool for the undergraduate course, research as well as for the legal acquisition of this dental organ. **Methods:** This is an observation and quantitative study, using a semi-structured questionnaire applied to the research participants. The Statistical Package for the Social Sciences program analyzed all the data, considering a reliability of 95% and using Fisher’s Exact test or the Person Chi-square test. **Results:** Although only 6.4% of the participants were familiarized with HTB, 99.1% considered their existence instrumental. As for the use of human teeth, 93.5% reported having used HTB during the course, but only 41.1% requested authorization to do so. **Conclusions:** The knowledge of students and professors of Dentistry about HTB and its legality in obtaining this body is insufficient, although the use of human teeth and the importance attributed to the existence of HTB is high.

**Keywords**: Dental Ethics; Directed Tissue Donation; Higher Education Institutions; Human Tooth Bank; Dentistry.

**INTRODUCTION**

The Human Teeth Banks (HTB) are defined as philanthropic institutions linked to universities, clinics or hospitals. they aid in the academic activities supplying human teeth for scientific purposes and didatic. [1]

After approval of the Law of Transplants in Brazil, of number 9.434 (Brazil, 1997), the human teeth passed to be recognized as organs [2] and being like this its origin should not be ignored and its legal source should be starting from a HTB. Its use without proven origin is besides considered crime. [3]

The dental organ is frequently used by academics and researchers of Dentistry and its illegal use is a common practice in the academical centers. [1] Besides such situation crime to be considered, those teeth might not have gone by correct processing procedures: cleaning, disinfection, sterilization and storage, what turns them an infection source. [4]

Linked HTB to the courses of Dentistry don't just reduce the risk of infections crossed coming of the incorrect handling of the dental organ, but they also respect a legal norm, at the same time that they organize the supply of the teeth for the students of the graduation and masters degree [5]. Since the institution HTB was created and it began sweats popularization, there was a larger perception as for the importance of the dental element as organ, fact that influenced in the increase of donations favoring the accomplished activities. [2]

With the surgeon-dentists' knowledge and graduation students in Dentistry about HTB and the donation of organs, it increases the understanding on the importance of that resource and the knowledge because personal collections of teeth should not be maintained, it is necessary the incentive to the creation of HTB and the donation of teeth to the same, thereby contributing with the academic formation and scientific research in an ethical and legal way. [4,5]

An evaluation of the teachers' knowledge and students of the teaching institutions has fundamental importance for a subsequent structuring of a HTB, being taken into account the characteristics of the observed territory. [6]

It was aimed at to evaluate the students' and teachers' knowledge of the Course of Dentistry in the Federal University of Ceará about HTB and to investigate the legality in the obtaining of teeth, existence and importance of the same in the graduation and in the research according to the participants' optics.

**METHODS**

**Ethical considerations**

This study was led to the Committee of Ethics in Research of the Federal University of Ceará and approved under number 538.659. All the participants of the research signed an Informed Consent Form (ICF) that explained the accomplishment of the study, the objectives, risks and benefits to the which would be exposed, in agreement with the Guidelines and Regulator Norms of the National Council of Health (Resolution no. 466/2012).

**Research’s delimitations**

It was an observational study, descriptive and quantitative, using a semi-structured questionnaire, with 09 questions applied in a single moment to 93 academics and 16 teachers belonging of the course of Dentistry of the Federal University of Ceará. Previously, it was made a pilot study, where ten questionnaires were applied with the two investigated categories and analyzed by two teachers of the area of the collective health, that they modified them in way to avoid or to minimize induced answers.

**Sampling Calculus**

Based on similar study and being used the following formula, the size of the sample was calculated. A total of 109 participants proportionally selected between teachers and students properly linked to the Federal University of Ceara, in the Campus of Fortaleza, participated, being obtained this way a sample that has the capacity to represent that population with 95% of trust.

C:\Users\JUNIOR\Desktop\Sem título.png

Where p=0.88; N=327;α=0.05; EDFF = 1

**Inclusion criteria**

Students regularly enrolled and in activities in clinic and laboratory in the Course of Dentistry of the Federal University of Ceará and that authorized the participation in the research signing ICF; teachers linked to the Dentistry Clínic and Restoring Dentistry departaments of the Federal University of Ceará, selected in a random way and that they consented their participation in the referred study, signing ICF.

**Exclusion criteria**

Students that were not regularly registered and in activities in clinic and laboratory in the Course of Dentistry; teachers retired and/or moved away of the Course of Dentistry of the Federal University of Ceará.

**Statistical analysis**

The data were tabulated in Microsoft Excel 2010 for Windows and exported for the software Statistical Packacge for the Social Sciences, in which all of the analyses were accomplished considering a trust of 95%. The tests Exact of Fisher or Qui-square of Pearson were used in order to accomplish the necessary statistical crossings. All the data were expressed in absolute and percentile form of frequencies.

**RESULTS**

It was observed in the present study that 11,9% of the participants knew some Bank of Organs or Woven, and in relation to the existence of some HTB, only 6,4% knew some, mentioning as example HTB of University of Dentistry of the University of São Paulo (FOUSP). Most (96,3%) of the population of that study it considered the tooth an organ and 99,1%, they were in favor of the donation of organs, however, when questioned about the voluntary donation of their own dental elements, that percentile one decreases to 86,2%. HTB was considered important for 99,1% of the participants.

Of the 93,5% of the participants that used human teeth during the graduation, more of the half (58,9%) it used without the donor's authorization (Table 1).

The Table 2 display that of the participants of the research that mentioned to know some HTB, all (100%) they considered important that equipment and 99,0% would donate their own dental elements to a Bank of Teeth. Among the one that mentioned know not HTB, 99% considered important this equipment and 86,3% would donate their teeth. To know Bank of Teeth didn't influence in any other answer once the values of p were larger than 0.05.

Of the participants that mentioned to be in favor of the donation of organs, 86,1% would donate their own teeth to a HTB, a percentile one smaller when compared to the population that mentioned not to be in favor of the donation of organs, where 100% would donate their dental elements to a HTB (Table 3)

In relation to the existence of a HTB, 60,6% of the participants of the research considered that the existence of that equipment in the University would facilitate the academic activities a lot. The note for importance of a Bank of Teeth was 4,22 ± 1,23 points (Table 4)

**Table 1:** Students' and teachers general knowledge of the Course of Dentistry/FFOE/UFC on Human Teeth Bank. Fortaleza-CE, 2014.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Professional category** | |  |
|  | **Student** | **Professor** | **p-Value** |
| **Knows Tissue Banks** |  |  |  |
| **Yes** | 7 | 8\* | <0,001 |
|  | 7,5% | 50,0% |  |
| **Knows Human Teeth Banks** |  |  |  |
| **Yes** | 1 | 6\* | <0,001 |
|  | 1,1% | 37,5% |  |
| **Considers tooth na organ** |  |  |  |
| **Yes** | 90 | 15 | 0,475 |
|  | 96,8% | 93,8% |  |
| **Is in favor of organ donation** |  |  |  |
| **Yes** | 92 | 16 | 1,000 |
|  | 98,9% | 100,0% |  |
| **Considers Human Teeth Bank important** |  |  |  |
| **Yes** | 93 | 15 | 0,147 |
|  | 100,0% | 93,8% |  |
| **Used human teeth at graduation** |  |  |  |
| **Yes** | 90\* | 12 | 0,009 |
|  | 96,8% | 75,0% |  |
| **If yes, which way** |  |  |  |
| **University** | 32 | 5 | 0,422 |
|  | 32,0% | 38,5% |  |
| **Private** | 23 | 2 |  |
|  | 23,0% | 15,4% |  |
| **Public** | 35 | 3 |  |
|  | 35,0% | 23,1% |  |
| **No answer** | 8 | 3 |  |
|  | 8,0% | 23,1% |  |
| **Other** | 2 | 0 |  |
|  | 2,0% | ,0% |  |
| **Would donate your teeth** |  |  |  |
| **Yes** | 80 | 14 | 1,000 |
|  | 87,0% | 87,5% |  |
| **You would receive restoration (fragment collage)** |  |  |  |
| **Yes** | 54 | 9 | 1,000 |
|  | 59,3% | 56,3% |  |
| **Used teeth without authorization** |  |  |  |
| **Yes** | 53 | 8 | 0,758 |
|  | 58,9% | 66,7% |  |

\* p <0,05, Qui-squared Test of Pearson or Exact of Fisher, Data expressed in form of absolute frequency (percentile frequency)

**Table 2:** Relationship between knowledge of the existence of Human Teeth Bank and general knowledge about Human Teeth Bank for the professors and students of the Course of Dentistry/FFOE/UFC. Fortaleza-CE, 2014.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Knows Human Teeth Bank** | | **p-Value** |
| **Yes** | **No** | **Yes** |  |
|  | **n %** | **n %** |  |
| **Considers tooth an organ** | 99 97,1 | 6 85,7 | 0,236 |
| **Is in favor of organ donation** | 101 99,0 | 7 100,0 | 1,000 |
| **Considers Human Teeth Bank important** | 101 99,0 | 7 100,0 | 1,000 |
| **Used human teeth at graduation** | 96 95,0 | 5 71,4 | 0,065 |
| **Origin** |  |  |  |
| Dentistry college | 35 34,0 | 2 40,0 | 0,780 |
| Private odontological office | 24 23,3 | 0 0,0 |  |
| Public Health Unit  No answer | 32 31,0  10 9,80 | 2 40,0  1 20,0 |  |
| Others | 1 1,0 | 0 0,0 |  |
| **Would donate your teeth** | 88 86,3 | 6 85,7 | 0,960 |
| **Used teeth without authorization** | 57 55,8 | 3 42,8 | 0,557 |

\* p <0,05, Qui-squared Test of Pearson or Exact of Fisher, Data expressed in form of absolute frequency (percentile frequency)

**Table 3:** Relationship between the donation of organs and general knowledge about Human Teeth Bank for the professors and students of the Course of Dentistry/FFOE/UFC. Fortaleza-CE, 2014.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Is in favor of organ donation** | | **p-Value** |
| **Yes** | **No** | **Yes** |  |
|  | **n %** | **s %** |  |
| **Considers tooth an organ** | 1 100,0 | 104 96,3 | 0,845 |
| **Considers Human Teeth Bank important** | 1 100,0 | 107 99,1 | 0,923 |
| **Would donate your teeth** | 1 100,0 | 93 86,1 | 0,698 |
| **Used teeth without authorization** | 1 100,0 | 59 54,6 | 0,410 |

\* p <0,05, Qui-squared Test of Pearson or Exact of Fisher, Data expressed in form of absolute frequency (percentile frequency)

**Table 4:** Note attributed to the importance of a Human Teeth Bank by the professors and students of the Course of Dentistry/FFOE/UFC. Fortaleza-CE, 2014.

|  |  |  |  |
| --- | --- | --- | --- |
| **Assigned grade** | **n** | **%** | |
| 0 | 4 | 3,7 |
| 1 | 1 | 0,8 |
| 2 | 4 | 3,7 |
| 3 | 15 | 13,8 |
| 4 | 19 | 17,4 |
| 5 | 66 | 60,6 |
| **Total** | **109** | **100,0** |

**DISCUSSION**

Procedures that use human teeth for academic and scientific purposes should respect ethical and legal aspects, and for that such procedures should be accomplished with a larger responsibility on the part of the researchers, professors and students [7]. In the last years, the increase of researches in vitro that use human teeth brought to the surface ethical questions around this subject, from the illegal trade to the storage of the extracted teeth and the incorrect handling. [8]

In spite of the human teeth they be frequently used in Higher Education Institutions (HEI), a knowledge lack exists on the part of the population as the existence of Bank of Organs and Tissue, especially Bank of Teeth, that they were created later, what maybe justifies the ignorance of its existence for great part of the population, besides for students and professionals of Dentistry [4]. In the present study, accomplished in the Course of Dentistry of the Federal University of Ceara, it was observed that only 11,9% of the participants knew some Bank of Organs or Tissue, and only 6,4% knew some Human Teeth Bank.

To present research it corroborated with Pinto et al. (2009) data, where in spite of more than 70% of the studied population to consider the tooth an organ, only 6% sought a HTB for acquisition of the teeth in their activities. In the research accomplished in the Course of Dentistry of the Federal University of Ceara, 96,3% of the interviewees considered the dental element an organ, however they didn't acquire teeth, for their experiments, through a HTB. In that same study, Pinto et al. (2009) they told that 97,6% of the interviewees declared to be in favor of the donation of organs and 90% of the same ones were favorable the donation of teeth for HTB. Those data were similar to it of the present work, where 99,1% of the studied population self declared in favor of the donation of organs and 86,2% would donate their teeth for a HTB.

A research back top 2003 considered the implantation of HTB in HEI a fundamental process to promote the use of the dental organ in an ethical way, avoiding the illegal trade in degree courses and master degree of Dentistry. In the research in subject, 99,1% of the participants answered to consider important a HTB. [9]

The use of teeth in the courses of Dentistry is being more and more constant, however, a lot of times with inadequate use. Teeth of ignored origin and that they didn't receive the necessary decontamination [3]. In this research, 93,5% affirmed to have used teeth in academic activities, telling as origin: University of Dentistry, Private Clinic, Unit of Public Health, among others.

In the study of Pinto et al. (2009) was verified that 90% of the professionals and 86% of the graduation students confirmed the use of extracted human teeth during the dentistry course. In that same research, 72% of the surgeon-dentists and 98% of the students ignored the existence of a HTB. Coincident data with the present study, where 93,5% of the participants used human teeth during the graduation, and 93,6% ignored the existence of a HTB. That situation is quite preoccupying, because besides the risk of acquiring crossed infections through the manipulation of polluted biological material, there is the disrespect to the laws, because most of the time they happen illegal practices in the obtaining of the teeth, what stimulates, besides, the trade of the same ones in clinics, cemeteries and hospitals. The knowledge of the origin of the dental organ besides a larger safety makes possible to join a larger social value, increasing the commitment and compromising in odontology researches.

Researchers evaluated from the origin, decontamination and use of the human teeth used in HEI and confirmed the existence of the illegal trade of teeth during a study in 2007. [10]

Back to 2001 researchers sent letters together with a questionnaire for 113 HEI of Dentistry of Brazil in order to evaluate the evolution, the organization apprenticeship and implementation of HTB in the country. A total of 36 of contacted HEI answered to the questionnaire and of those only 10 universities mentioned to have a HTB. In that same study, the authors observed the existence of HTB in the areas Northeast, Southeast and South of Brazil. [11]

In a similar study, Freitas et al. (2012) they analyzed the aspects related to the use of extracted human teeth in the degree courses and masters degree in Brazil and the existence of HTB in HEI of Dentistry. The authors verified that in 187 courses of Dentistry in the country, only 37 possessed HTB, being 21 in the Southeast area, 9 in the South area, 3 in the Northeast area, 3 in the North area and 1 in the area Center-west.

It will be necessary a time so that the culture of valorization of the dental organ is formed by the people. It is essential that HEI of Dentistry include information about HTB in their curricular grade, plan popularization campaigns so that students and professionals understand the importance of the ethics and legality that it involves the use of the dental organ. Professors should be followers the use of the teeth in an ethical way, implanting protocols for its use and motivating the creation of HTB. [8]

**CONCLUSION**

In agreement with the data found in that research, it is ended that:

Few participants have knowledge of the existence of HTB, in spite of almost all have already used teeth in activities in the course of Dentistry. Those teeth, in most of the cases, were acquired in an illegal way.

Almost all participants considered important and necessary the existence of a HTB in the Institutions of Teaching in Odontology Research.

It is necessary accomplishment of informative campaigns so that it happens the use of human teeth in a legal way, fact directly related to the implementation of HTB in HEI of Dentistry. HTB already existent they should be published for the society in order to increase the knowledge as for the subject.

**REFERENCES**

1. Nassif ACS, Tieri FA, Ana PA, Botta SB, Imparato JCP. Estruturação de um Banco de Dentes Humanos. *Pesquisa Odontológica Brasileira*, 2003;**17**(1):70-74.
2. Gomes GM, Pupo YM, Gomes OMM, Schmidt LM, Junior VAK. Utilização de dentes humanos: aspectos éticos e legais. *Revista Gaúcha de Odontologia*, 2013; **61**(1):477-483.
3. Moreira L, Genari B, Stello R, Collares FM, Samuel SM .Banco de Dentes Humanos para o Ensino e Pesquisa em Odontologia. *Revista da Faculdade de Odontologia de Porto Alegre*, 2009; **50**(1): 34-37.
4. Pinto SL, Silva SP, Barros LM, Tavares EP, Silva JBOR, Freitas ABDA. Conhecimento Popular, Acadêmico e Profissional sobre o Banco de Dentes Humanos. *Pesquisa Brasileira em Odontopediatria Clinica Integrada*, 2009; **9**(1): 101-106.
5. Poletto MM, Moreira M, Dias MM, Lopes MGK, Lavoranti OJ, Pizzatto E. Banco de dentes humanos: perfil sóَcio-cultural de um grupo de doadores. *Revista Gaúcha de Odontologia*, 2010; **58**(1): 91-94.
6. Silva MF, Mandarino F, Sassi JF, Menezes M, Centola ALB, Nonaka T. Influência do tipo de armazenamento e do método de desinfecção de dentes extraídos sobre a adesão à estrutura dental. *Revista de Odontologia da Universidade da Cidade de São Paulo*, 2006;**18**(2):175-180.
7. Vanzelli M, Imparato JCP. 2003. *Histórico e Introdução. In: Banco de Dentes Humanos*. 1ª ed. Curitiba: Editora Maio; 2003.
8. Freitas ABDA, Pinto SL, Tavares EP, Barros LM, Castro CDL, Magalhães CS. Uso de Dentes Humanos Extraídos e os Bancos de Dentes nas Instituições Brasileiras de Ensino de Odontologia. *Pesquisa Brasileira Odontopediatria Clínica Integrada*, 2012;**12**(1): 59-64.
9. Ferreira EL, Fariniuk LF, Cavali AEC, Baratto FF, Ambrَsio AR. Banco de dentes: ética e legalidade no ensino, pesquisa e tratamento odontolَgico. *Revista Brasileira de Odontologia*, 2003; **60**(2): 120-112.
10. Costa SM, Mameluque S, Brandمo EL, Melo AEMA, Pires CPAB, Rezende EJC, Alves KM. Dentes humanos no ensino odontolَgico: procedência, utilização, descontaminação e armazenamento pelos acadêmicos da UNIMONTES. *Revista da ABENO*, 2007; **7**(1):6-12.
11. Begosso MP, Imparato JCP, Duarte DA. Estágio atual da organização dos bancos de dentes humanos nas faculdades de Odontologia do territَrio brasileiro. *Revista de Pós Graduação*, 2001; **8**(1):23-28.