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TEMA: Trademark selection criteria for bad dental implants used by specialists.

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CITAÇÃO

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PALAVRAS CHAVE

Implant system; selection criteria, Implantology

Objective: Determine the most used selection criteria when choosing a brand of dental implants by specialist dentists.

Material and method: If we identified the parameters for choosing an implant brand, we classified them into technical and market, sorting them into a closed-type questionnaire, valuing it by means of a psychometric scale from 1 to 5, plus an open question. It became a masterpiece for the convenience of twenty-one specialist dentists with less experience among three brands of implants. For the descriptive statistical analysis, Microsoft Excel 2011 version for Mac was used, using measures of central tendency such as Arithmetic and Fashion Media. The technical parameters were classified from 1st to 1st, marketing from 2nd to 2nd and suggested from p1 to p7.

Results: The variability in prosthetic retention pillars, adequate availability of the products offered by the company and the compatibility of the additions between commercial brands, were the most relevant factors considered by specialists at the time of choosing a certain implant system.

Conclusion: The reasons that influence the choice of an implant system are the variety and availability of products along with compatibility between brands.

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Critérios de seleção para a marca comercial de implantes dentários mais utilizados por especialistas.

RESUMO

Objetivo: Determine os critérios de seleção mais utilizados ao escolher uma marca comercial de implantes dentários, de acordo com dentistas especializados.

Material e método: Foram identificados os parâmetros para escolha da marca de implante, classificados em técnico e de marketing, solicitados em questionário do tipo fechado, avaliados pela escala psicométrica Likert de 1 a 5, além de uma pergunta em aberto. Uma amostra de conveniência foi coletada de vinte dentistas especialistas com experiência em pelo menos três marcas de implantes. Para a análise estatística descritiva, foi utilizada a versão Microsoft Excel 2011 para Mac, utilizando medidas de tendência central, como Média Aritmética e Moda. Os parâmetros técnicos foram classificados de 1a a 1i, os parâmetros de marketing de 2a a 2f e os sugeridos de p1 a p7.

Resultados: A variabilidade nos pilares de retenção protética, a disponibilidade adequada dos produtos oferecidos pela empresa e a compatibilidade dos anexos entre as marcas foram os fatores mais relevantes considerados pelos especialistas na escolha de um determinado sistema de implante.

Conclusão: Os motivos que mais influenciam a escolha de um sistema de implante são a variedade e disponibilidade de produtos, além da compatibilidade entre as marcas.

PALAVRAS CHAVE: Sistema de implantes; critérios de seleção, Implantodontia

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INTRODUCTION

Dental implantology today is a viable and predictable treatment alternative with important supporting scientific evidence [1 2 3 4 5 6] . Since its inception, it has sought to propose itself as an alternative treatment for totally or partially edentulous patients, unlike prostodoncia, the traditional removable one remains. In the last years there has been a great evolution of implant systems [7] , resulting in a wide and wide range of existing systems and offers as well as standards and supporting certifications. Therefore, the selection of a particular dental implant system is a complete process [8] , even though it was intended to standardize this process [9 10 11] .

Thanks to the studies by Professor Brånemark and his work team, the end of the endoosseous anchorage and the concept of osteointegration, as *"direct, structural and functional connection between the living, orderly man, and the surface of an implant under the functional load "* [12 13] .

The implanted anchorage differs significantly from one location. Different biomaterials, metallic as ceramics, can be used in the manufacture of implants, being Titanium the most widely used due to its biocompatibility. Among the different combinations the concentrations of the latter are commercially pure titanium, CPTi, and the Ti-6AL-4V alloy. The CPTi is the most used representation; and there is less than 0.25% of impurities [14 15 16] .

Each system is different but the parts are basically preserved. *Fixing the body* is the component that joins the hand. Depending on the system, the fixation can have different surfaces: threaded, with grooves, perforated, sprayed with plasma or cover. Each type of surface is designed for a specific purpose, such as achieving the largest surface area with the cortical adjustment that ensures anchorage. The second component, the *transepithelial pillar* , provides a connection between fixation and prosthesis. The pillar is connected to the fixation by means of a screw, which can also be cemented or rubbed. The pillars adjust to the fixation by means of a hexagon or another geometric shape,

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internal or external, which could also be an anti-rotational and biomechanically important device for the prosthetic design. The last part is the *prosthesis* , which can be joined to the pillars by means of screws, cementing the retainers with precision [17 18 19] .

Various authorities regulating the market and distribution of materials and devices for dental use according to standards and specifications of international applicability. In the United States, the Dental International Federation (FDI), jointly with the International Standardization Organization (ISO), through the American Standards Institute (ANSI); I work to establish international specifications for dental biomaterials. ISO entiéndase an international organization in the gubernamental formed by national organizations of standardization of more than 80 countries, being the American representative the American National Standards Institute, ANSI. ISO by means of technical committees creates standards to prove the effectiveness and safety of dental products. Of these committees, the CT-106 is responsible for issuing standards, terminology, test methods and specifications applicable to all materials and devices for dental use. A total of 134 dental standards have been published in relation to the CT-106, which is structured by subcommittees, SC and working groups, GT. So we have that subcommittee 8, entiéndase CT 106 / SC8, is the subcommittee charged with normalizing and standardizing everything related to dental implants. The CT 106 / SC8 is formed by GT working groups, as follows: GT1, *implantable materials* ; GT2, *evaluation and preclinical biological problems* ; GT3, *containing technical files* ; GT4, *mechanical problems* ; GT5, *dental implants - terminology* . The benefit of counting on dentistry specifications is incalculable, if the saturation in the information given by the trade is met. As such, dentists care for impartial and reliable selection criteria [20 21 22 23] .

La American Dental Association, ADA, by means of its scientific advice, together with the American National Standards Institute, ANSI; issue an approval ticket for different dental products on the market. Counting the sale with this sale is not an impediment to the commercialization of implants, but the companies voluntarily add to such certification. The scientific guidelines and requirements

that the ADA follows to issue its acceptance label are more strict than the FDA guidelines, considering studies and clinical trials with up to 5 years of follow-up. In the last published update regarding dental implants in the year 2004 of the ADA, a certain number of commercial implant houses were granted voluntarily to the evaluation of the donation. Some of the participating brands were Astra Tech, Nobel Biocare and Strauman, among others [24 25] .

Europe, Asia and Australia, among others, have similar programs. Highlights the European Committee for Standardization, CEN, set of the Medical Devices Directive, who in Europe write recommendations for standards on medical devices. The CE mark in Europe denotes compliance compliance according to the essential requirements of the Medical Devices Directive. The latter entity requests that all implanted commercials be submitted to clinical studies and multidisciplinary risk analysis, in accordance with the EN-ISO regional standards, and to decide on the ISO [26] European regional standard.

Given the diversity of brands, the clinician faces the task of choosing a type of implant from a varied offer. It will take the need for scientific evidence to support the decision and not just be based on proposals for a commercial brand. Many studies provided by companies are not supported by randomized controlled trials only by *in vitro studies* , many of them also report long-term follow-up, so comparisons between brands are difficult. Due to market competitiveness, companies seek to provide data that supports their product in order to demonstrate their commercial superiority. A factor to consider when making a decision for a particular brand influences factors such as economic cost and previous experience of use. If objective, the available evidence regarding a system in question must be evaluated, valuing mostly randomized controlled studies and meta analysis, which are the highest levels in the evidence hierarchy [27 28] .

Bibliographic revisions take considerable time, so information resources are available within the reach of the clinic, such as the Cochrane Collaboration, the continuing education department of the ADA and the Journal of Evidence - Based Dental Practice, among others, providing valuable assistance. fin of making clinical decisions based on evidence.

Therefore, the present study intends to determine the most used selection criteria when choosing commercial brands of dental implants by specialist dentists in the area.

METHODS

The present investigations are of an observational descriptive type, in the experimental, of a transversal type.

The central variables in the selection criteria used to choose a commercial brand of dental implants. For the identification of variables, a bibliographical review of the scientific literature was carried out as well as a review of the commercial offer of the different red companies. The search for these commercial houses was carried out through the Internet, identifying a total of 26 companies. Through this medium if I have access to the commercial information of these companies, seeking that the information of their offer could be accessible via catalog, in PDF format or WEB format. Companies that do not have access to their catalogs in any of these formats have been personally contacted in order to obtain printed catalogs. The end of this search was to identify the wide range of commercial houses there as well as a quick review of the offer and the accessibility of its information.

The variables luego were classified in *techniques and marketing* . Each one orders for itself other subdivisions, the technical parameters are: 1) Method of manufacture, which corresponds to the biomaterial used and the characterization of the surface treatment of the implant; 2) Prosthetic components and systems, which includes the implant macrodiseño, connection systems and prosthodontic retention systems; 3) Norms and certifications of support, which includes international norms of standardization and sells of certification. The marketing parameters are divided as follows: 4) Marketing strategy, which includes academic support and continuing education, dissemination of the offer, distribution and availability of products; 5) Financial

cost; 6) Country of origin / manufacture. The variables described are of nominal qualitative order, pues describing categories.

The criteria for the inclusion of the participating experts determined the suitability of the objectives of the study, and corresponds to dentists who are specialists in implantology, oral rehabilitation, maxillofacial surgery and periodontics, with clinical experience in at least three commercial brands of dental implants, acceded to participate. . The interview was selected according to the criteria mentioned, comprising a total of 20 interviewees. We have contacted each other personally among members of the Oral Health Society and Rehabilitation, the specialist specialist in Oral Rehabilitation.

The method of collecting the information was through a survey that took place in time. First, a pilot study that was distributed among 15 specialists related to the implantological area and oral rehabilitation, which allowed us to collect the first data and correct errors in the writing, at the end of a lesson and accessible comprehension of mismas, trying to be simple and easy. clear. According to the time, the final survey will allow us to identify among the specialists the objectives of the studio. This final survey was made up of a total of 25 specialists. Applying the aforementioned inclusion criteria, finally the sample is reduced to a total of 20 subjects, 5 of which do not contest the complete survey.

The design of the surveys is of a quantitative and qualitative nature, open and closed, descriptive, transversal and self-fulfilling by the participants. The central variables were evaluated by means of a system of closed questions, responding by means of a summative scale method in order to facilitate the later analysis of data. For it, the Likert scale was used, valuing the items in five ordinal levels: 1-Very important, 2-Important, 3-Moderately important as neutral / affirmative value, 4-Very important and 5-Not important [29] .

In detail, if you change the parameters that guide the selection criteria for selecting a specific brand, any of them have been previously identified in the bibliography, constituting the questionnaire system, which is based on a system of closed questions, with different variables. to the experts. In the survey, the collected variables are ordered based on the groups: A) technical parameters

and their subdivisions; B) market parameters and subdivisions. From this order, a criterial interpretation of the collected values was realized with respect to a Likert scale. This is built from the score obtained on each item; meaning that each summation derives from a promedial index obtained through the Arithmetic Media, generating promedios for each variable. The values obtained are interpreted according to the Likert scale, from 1 to 5 respectively.

The survey contains an open-ended component, giving the dentist the opportunity to suggest other parameters for the next question: *"In relation to the factors mentioned in these questions, there is something else that you consider important to take in your selection. commercial brand of dental implants and that hasn't been mentioned in this survey? "* . The answers to this question are in agreement with the end of the specific objectives, and thus identify parameters by means of which to establish selection criteria and that, the consideration of the question, in the habit has been taken in advance in the closed questions.

In order to organize the data, an ordering of the variables with classifying finances is carried out, being ordered the technical parameters from 1st auction to 1st, the marketing of 2nd auction to 2f and the suggested parameters from p1 to p7. For its statistical analysis, the Microsoft Excel 2011 program was used in its version for the Mac Os X system, tabbing the information collected using an Excel dynamic table, performing descriptive statistical analyzes based on central tendency measures such as Arithmetic Media. Regarding the open question, the answers are tabulated on a Frequency Board, they are for the purpose of ordering, grouping and summarizing the information.

RESULTS

In Table No. 1 , if you observe the technical variables alphabetically ordered, from 1st to 1st, as well as their respective valuation according to each interviewee, with values from 1 to 5 on the Likert scale, where: 1a, specification of the metal and type of alloy; 1b, surface treatment used; 1c, macro design of the implant body; 1d, different connection systems available; 1e, variety in

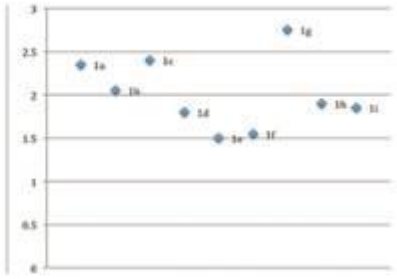
prosthetic retention pillars; 1f, easy to use prosthetic components; 1g, simplicity of the surgical box; 1h, support in certification sells, such as ANSI / ADA, FDA, ASTM or others; 1i, specification of ISO standards for standardization.

Table 1 Technical parameters, Likert values, sum and arithmetic media.

¿Cuáles de los siguientes factores técnicos mostrados toma usted en consideración en consideración al escoger una marca comercia de implantes dentales?									
VARIABLES									
ODONTÓLOGOS	**1a**	**1b**	**1c**	**1d**	**1e**	**1f**	**1g**	**1h**	**1i**
1	1	1	3	1	1	1	5	1	1
2	5	5	5	5	5	5	5	5	5
3	2	1	2	1	1	1	2	1	2
4	1	1	2	1	1	1	3	1	1
5	2	2	2	1	1	1	1	2	2
6	1	2	1	1	1	1	2	2	2
7	2	2	2	1	1	1	1	2	2
8	1	1	2	1	1	1	2	1	1
9	5	1	1	3	1	2	3	1	2
10	4	3	1	2	1	1	2	2	1
11	2	1	5	2	1	1	5	1	1
12	1	1	1	1	1	1	1	1	1
13	2	3	2	1	1	2	2	1	2
14	5	5	5	1	2	1	5	5	2
15	1	1	1	1	2	2	2	1	1
16	2	1	2	2	1	1	5	1	1
17	2	2	3	3	1	1	1	2	2
18	5	5	5	5	5	5	5	5	5
19	1	1	2	2	1	1	1	1	1
20	2	2	1	1	1	1	2	1	2
Resumen	**1a**	**1b**	**1c**	**1d**	**1e**	**1f**	**1g**	**1h**	**1i**
1 – Muy importante.	7	10	6	12	16	15	5	12	9
2 – Importante.	8	5	8	4	2	3	7	5	9
3 – Medianamente importante.	0	2	2	2	0	0	2	0	0
4 – Poco importante.	1	0	0	0	0	0	0	0	0
5 – No importante	4	3	4	2	2	2	6	3	2
SUMATORIA ODONTÓLOGOS	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**	**20**
MEDIA ARITMETICA (X)	**2.35**	**2.05**	**2.4**	**1.8**	**1.5**	**1.55**	**2.75**	**1.85**	**1.85**

Figure 1 shows the values of the arithmetic mean for each technical variable, dispersed in a plane taking as reference the scale of evaluation from 1 to 5.

Variable	X
1a	2.35
1b	2.05
1c	2.4
1d	1.8
1e	1.5
1f	1.55
1g	2.75
1h	1.9
1i	1.85



Considerando escalamiento: 1 2 3 4 5

Figure 1 Graph of dispersion, arithmetic media, technical variables, Likert scale.

In Table No. 2 , if the market variables are alphabetically ordered, from the 2nd to the 2nd, as well as the respective valuation of each according to the criteria of the interviewees, with values of 1 to 5 on the Likert scale, where: 2a, support academic and education continues from part of the commercial house; 2b, adequate availability of the products offered by the company; 2c, easy access to information, via printed catalogs, PDF format, web format or others; 2d, implant price; 2e, component price and other prosthetic additions; 2f, country of manufacture or the origin of the implant system.

Table 2 Market Parameters, Likert valuation, summary and arithmetic media.

¿Cuáles de los siguientes factores mercadológicos toma usted en consideración al seleccionar una marca comercial de implantes dentales?						
VARIABLES						
Nº ODONTÓLOGOS.	**2a**	**2b**	**2c**	**2d**	**2e**	**2f**
1	1	1	2	1	1	2
2	4	5	4	4	4	5
3	2	1	1	2	2	2
4	2	1	1	1	1	1
5	2	1	1	3	2	2
6	1	1	1	2	1	3
7	1	1	1	3	3	2
8	1	1	1	1	1	1
9	1	1	1	3	2	2
10	1	1	1	3	2	3
11	2	1	1	5	2	1
12	1	1	1	1	1	1
13	3	2	2	3	3	2
14	4	2	2	3	3	2
15	4	1	2	1	1	2
16	3	1	3	1	1	2
17	2	1	1	2	2	2
18	5	1	5	5	5	1
19	2	1	2	1	1	2
20	3	2	2	2	2	3
Resumen	**2a**	**2b**	**2c**	**2d**	**2e**	**2f**
1 – Muy importante.	7	16	11	7	8	5
2 – Importante.	6	3	6	4	7	11
3 – Medianamente importante.	3	0	1	6	3	3
4 – Poco importante.	3	0	1	1	1	0
5 – No importante	1	1	1	2	1	1
SUMATORIA ODONTÓLOGOS	**20**	**20**	**20**	**20**	**20**	**20**
MEDIA ARITMETICA (X)	**2.25**	**1.35**	**1.75**	**2.35**	**2**	**2.05**

Figure 2 shows the values of the arithmetic mean for each market variable, dispersed in a plane taking as a reference the scale of evaluation from 1 to 5.

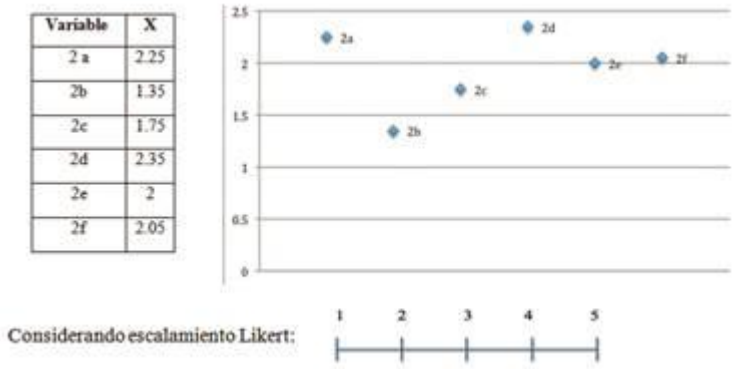


Figure 2 Graph of dispersion, arithmetic media, market variables, Likert scale.

Regarding the open question, out of a total of 20 interviewed dentists, only 9 of them decided to contest the question, obtaining a total of 12 different answers as they were suggested as variables or suggested parameters. With ordering lines and data tabs, just as previously done, these are ordered and classifying a total of 7 different answers from p1 to p7, where: p1, scientific support in clinical studies; p2, connection and single platform; p3, compatibility with other trademarks; p4, availability of the human person representing the brand; p5, security of continuity in time for the offer of additions; p6, versatility of systems; p7, implant quality and components.

In Table No. 3 you can see variable files, tabbing the data on a given Frequency Table, from which absolute frequency, relative frequency and relative percentage frequency are obtained.

Table 3 Table of frequency, suggested parameters, absolute frequency, relative frequency, percentage relative frequency, mode (MO).

P	Frecuencia absoluta	Frecuencia relativa	Frecuencia relativa porcentual
p1	2	0.166666667	16.67%
p2	1	0.083333333	8.33%
p3	4	0.333333333	33.33%
p4	2	0.166666667	16.67%
p5	1	0.083333333	8.33%
p6	1	0.083333333	8.33%
p7	1	0.083333333	8.33%
TOTAL:	12	1	100%

The ordering of the data could be obtained as a measure of central tendency to fashion (MO); which constitutes the value that is repeated in a given sample.

Fashion (MO):

The most abundant value of P is 4 = p3.

La Moda is p3. Mo = p3

In Figure Nº 3 , it is obtained from the chart of frequencies, a diagram of sectors, taking as reference the relative relative frequency.

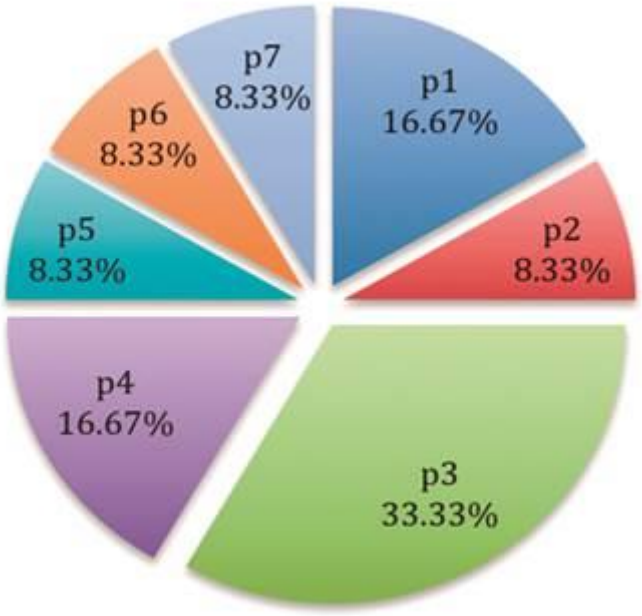


Figure 3 Diagram of sectors, relative percentage frequency.

DISCUSSION

As well as analyzing the representative representative data in technical and market parameters, it is understood that the most important questions are the most important on the scale. So on the first question, the lowest promises are 1.5 and 1.55, and the highest score is 2.75. If the lowest value is 1.5 and the highest is 2.75, no one among the technical parameters exceeds by more than 3, the neutral / affirmative *'moderately important' value* on the Likert scale. So, at the discretion of the majority of surveyors, the parameters presented are all in the range of *'important' to 'very important'* , (Figure No. 1). The most important technical parameter is 1, 'variety of prosthetic retention pillars'.

In the second question, market parameters, while the measurement of variables it is observed that the most important values are 1.35 and 1.75. Observing the total of promises in these parameters, and having the highest value 2.35, the promises in the superan the number 3 according to the scale, neutral / affirmative value. Because of all the parameters presented, they are of great importance according to the interviewees (Figure 2). Amongst these, the most important is 1.35 and 2b, which corresponds to *'adequate availability of the products offered by the company'* .

On Question 3, suggested parameters are described. In your analysis, refer to the sector diagram, (Figure No. 3), reproduced from a table of frequencies, (Table No. 3). In addition to being nominal qualitative variables, if a sector diagram is shown on the bar graph due to the fact that the relative relative frequency represents sectors in percentages and classifies in categories in the quantitative ordinals. Sorting variables from p1 to p7 is with fine classifications. So p3, *'compatibility with other trademarks'* , has the highest percentage relative frequency, 33.33%, but also the value that repeats according to Fashion and the most suggested parameter.

Once the criteria used are misused, it is advisable to also inquire whether they are taken by the consulted companies. Ello would give continuity to this work by offering more specific answers. We recommend a comparative study for each criterion versus the commercial offer offered in catalogs and also, conveniently, versus a new assessment applied by experts. He is out of the objectives of the present work, which there are limitations to carry out the suggested exercise; ejemplo el criterio 1f, *(easy to use prosthetic components)* . To compare such feasibility there was a new questionnaire that collected applied appreciation. About the same, catalogs consulted by Neodent, Alpha-Bio and Biohorizons, to mention some, present clear schemes, guides, details and useful information for the clinician, facilitating their application. It is also important to consider the complexity of the offer. In each catalog studied there are similarities, as well, as well as a specialist with the necessary training to easily and properly handle the prosthetic components, and the simplicity of the commercial offer between the additions and what must be specifically evaluated when considering the criteria 1f .

Recital 1e, *'variety in prosthetic retention pillars'* , the most important technical criterion; Neodent for his variety cumple bien con ello. Mozograu on the other hand, with the types of connection presents platforms in three diameters (Mini, Standard and Maxi), having a variety of counting with pillar for CAD-CAM and pillars in ball. The Pi Brånemark house with connection types (HE, external and amplified hexagon, internal hexagon), also presents a variety of conical, aesthetic columns, in different diameters, among others; but not with pillars or ball for CAD-CAM. Alpha-Bio handles different types of implants, all with internal connection, with a wide variety of components, molded and cemented; in addition to its Arrow Press Changeable implant line with exclusive additions. Among the houses consulted, Biounite presents less, even in the disabled, a variety of components based on the systems, external HW and internal ZD. There are also brands with more variety than others, all of which offer a considerable range of prosthetic additions. It may be decided that most brands fulfill the criteria 1e.

In analyzing 2b, adequate availability of the products offered, there are limitations that require a real appreciation for each case, but it is estimated that the majority of brands consulted have adequate availability. However, some catalogs are not available in the local market, but because they are in another language, with very clear information, they are not available in PDF formats, printed on the web. Houses such as Q-Trinon and Biounite, whose web pages in Chile offer a few details of their products, do not currently have available catalogs. It is possible that some company does not have the availability of any addition, so wait for the extraordinary time that you requested to use the extra time and valuable waiting time. Important then the good presentation, catalogs adapted to the local market, clear and accessible information, quick quotes and answers, availability of products and reasonable waiting times. Considerations for 2b in accordance with criterion 2c, easy access to information via printed catalog, PDF format, web or other. Appendix 1 shows the commercial houses consulted, feasibility of accessing your offer, and it is in PDF format, printed on the web.

Among the suggestions given by experts, compatibility between brands is interesting. This answer reflects practical interests on the part of clinicians. It is advisable to evaluate the costs and benefits of interchangeable elements between brands, even though some specific pillars fit into pillars of other brands, these pose different methods, chemical composition and manufacturing materials; that is why the use of components and implants of the same brand are the most recommended to prevent fractures or the impact of screws [29] .

In the present work, a master has been selected for convenience, a subset of individuals from a particular population, specialist dentists, using established inclusion and exclusion criteria. It is clear that the most important aspect to be taken into account when choosing a studio apartment is that it is representative, therefore it is recommendable to replicate this studio using a larger studio, to obtain more significant conclusions.

CONCLUSION

The selection criteria used to choose a particular brand of dental implants, according to the criteria of the specialist dentists interviewed on the *variability in prosthetic retention pillars, the adequate availability of the products offered by the company and the compatibility of the additions between commercial brands*

REFERENCES

1. National Institutes of Health: Consensus development conference statement on dental implants. J Dent Educ. 1988;52:824-827.

2. Misch CE. Dental education: meeting the demands of implant dentistry. J Am Dent Assoc. 1990;121:334-338.

3. van Steenberghe D, Lekholm U, Bolender C et al. The applicability of osseointegrated oral implants in teh rehabilitacion of partial edentulism: a prospective multicenter study on 558 fixtures. Int J Oral Maxillofac Impl. 1990;3:272-281.

4. Kline R, Hoar JE, Beck GH et al. A prospective multicenter clinical investigation of bone quality-based dental implant system. Implant Dent. 2002;11:224-234.

5. Chowdhary R, Chowdhary N. Need of implant dentistry at undergraduate dental curriculum in Indian dental colleges. Indian J Dent Res. 2011;22(3):436-9.

6. Salinas TJ, Block MS, Sadan A. Fixed partial denture or single tooth implant restoration? Statistical considerations for sequencing and treatment. J Oral Maxillofac Surg 2004; 62 (Suppl 2): 2-16.

7. Martínez-González JM., Cano-Sánchez J, Campo-Trapero J, Martínez-González MJS, García-Sabán F. Diseño de los implantes dentales: Estado actual. Avances en Periodoncia 2002;14(3):129-136.

8. Lazzara RJ. Criteria for implant selection: surgical and prosthetic considerations. Pract Periodontics Aesthet Dent. 1994;6(9):55-62

9. Misch CE, Misch CM. Generic terminology for endosseous implant prosthodontics. J Prosthet Dent. 1992, 68:809-812.

10. Drago C, Lazzara RJ. Guidelines for implant abutment selection for partially edentulous patients. Compend Contin Educ Dent. 2010;31(1):14-20, 23-4, 26-7; quiz 28, 44.

11. Sehee Lee, Jeongsam Yang, Jeongho Han. Development of a decision making system for selection of dental implant abutments based on the fuzzy cognitive map. Expert Syst Appl J. 2012;39(14-15):11564-11575.

12. Brånemark PI, Berine U, Adell R, Hansson BO, Lindström J, Ohlsson A. Intra-osseus anchorage of dental prostheses. I. Experimental Studies. Scand J Plast Reconstr Surg. 1969;3(2):81-100.

13. Brånemark PI, Zarb GA, Albrektsson T. Tissue-Integrated prostheses. Osseointegration in clinical dentistry. Int Dent J. 1985;35(4):259-65.

14. Anusavice, K.J. Phillips Ciencia de los materiales dentales. 11a. edición. Barcelona: Elsevier; 2004. p. 759-772.

15. Wang RR, Fenton A. Titanium for prosthodontic applications: A review of the literature. Quintessence Int. 1996;27:401-408.

16. O'Brien, W. Dental materials and their selection. 4th. ed. University of Michigan. Quintessence: 2008. p.300-313.

17. Misch, C. Contemporary implant dentistry. 3rd. ed. St. Louis: Mosby Elsevier. 2008.

18. Peñarrocha, M. Implantología oral. Barcelona. 1a. Edición. Barcelona: Ars Médica; 2001. p. 3-13.

19. Tufekci E, Brantley WA, Mitchell JC, McGlumphy EA. Microstructures of plasma-sprayed hydroxyapatite-coated Ti-6Al-4V dental implants. Int J Oral Maxillofac Implants. 1997 121;(1):25-31.

20. ISO/TC 106/SC 8. Dental Implants. International Organization of Standardization.

21. Bhatavadekar, N. Clinical decisions and the quality of evidence available for dental implants. J Periodontol. 2009;80(10):1559-61.

22. Rutkowski, J. Blade-Form Dental Implants: FDA Reclassification as a Class II Dental implant device. Journal of Oral Implantology. 2013;39(6):633-634.

23. ADA Council of Scientific Affairs. Dental endosseous implants: an update. J Am Dent Assoc . 1996;127:1238-1239.

24. ADA Council of Scientific Affairs. Dental endosseous implants: an update. J Am Dent Assoc . 2004. Jan; 135 (1):92-97.

25. Braceras I, Ipiñazar E, De Maeztu MA, Alava JI. Risk analysis and implants. Med Eng Phys 2008, 309)1201-1204.

26. Oxford Center for Evidence Based Medicine. Levels of evidence, 2011. (Consultado en Junio 02, 2014). Disponible en: Disponible en: http://www.cebm.net/ .

27. Bhatavadekar N. Assessing the evidence supporting the claims of select dental implant surfaces: A systematic review. Int Dent J 2008;58:363-370.

28. Likert, R. A technique for the measurement of attitude. New York. Woodworth, Editor; 1932.

29. Kim SK, Koak JY, Heo SJ, Taylor TD, Ryoo S, Lee SY. Screw loosening with interchangeable abutments in internally connected implants after cycling loading. Int J Oral Maxillofac Implants . 2012;27(1):42-7