

Estimate of chair hour cost in dental clinics in the city of Cuenca 2023

Maria Belén Durán Andrade ¹, Juan Francisco Pinos Pinos ¹, Mateo Steven Sánchez Moscoso ^{1,*} and Manuel Estuardo Bravo Calderón ²

¹ Dentistry student, Faculty of Dentistry, University of Cuenca, Ecuador.

² Orthodontics specialist, Faculty of Dentistry, University of Cuenca, Ecuador.

World Journal of Advanced Research and Reviews, 2023, 18(03), 1319–1322

Publication history: Received on 07 May 2023; revised on 19 June 2023; accepted on 21 June 2023

Article DOI: <https://doi.org/10.30574/wjarr.2023.18.3.1163>

Abstract

Objective: determine the cost of the chair hour of private dental offices in the city of Cuenca

Materials and methods: In the present analytical-observational research study, the use of different formulas was proposed to calculate the cost of the dental chair hour in each care provided by 70 private dentists in the city of Cuenca. The information obtained from the administrative data was collected and compiled in an excel sheet to be analyzed.

Results: The estimated hour-chair cost in the city of Cuenca is 2 dollars and 13 cents.

Conclusion: Knowledge of dental consultation costs, such as chair-hour cost, are necessary concepts in the administrative area so that health professionals have fully satisfactory efficiency in their offices.

Keywords: Dental chair cost; Dental economics; Cost analysis; Utility; Fixed and variable costs

1. Introduction

At present, there is a clear problem in the administrative-dental field. This problem is that most dentists do not know how to correctly manage the time and costs of their offices. Specifically, how to estimate the dental chair hour cost is the most controversial, since many dentists achieve it empirically, without taking into account all the economic aspects that come with it, so their economy and the efficiency of their consultation will be affected [1].

When you want to start a company it is necessary to have knowledge of the administrative area. In this, a cost analysis will be applied that informs us about the service that is generated taking into account labor, technology, equipment and raw material [2]. The cost system has elements that are related to each other to obtain the cost of providing a service, this allows knowing to what extent a discount can be given without representing a loss for the company and will also give it a competitive advantage by knowing its economic reality [2]. The cost is the amount paid for something, in dentistry we can identify direct or variable costs (inputs used in each practice) and indirect or fixed (investments to equip the office plus salaries and taxes), the latter representing almost 75% of the total costs. Indirect costs have increased in recent years due to the constant advancement of technology, thus requiring continuous renewals and that need to be considered when estimating a price for the service. This cost that is identified is the initial part to give a rate. The rate is considered as a utility and is greater than the cost, it can be established by demand, competition and total costs [2].

Fixed costs are those that do not vary, regardless of the number of patients who attend the consultation. For example, these may be: human resources, purchased equipment and instruments, or office rent. However, it should be noted that

* Corresponding author: Mateo Steven Sánchez Moscoso

these fixed costs can vary depending on the location and size of the clinic. On the other hand, variable costs are those that can increase or decrease depending on the size of production or the level of activity. For example, dental supplies, utility services, and general services such as waste disposal and taxes. The chair hour cost calculation is determined by adding the fixed and variable costs and calculating them per hour of dental care [1].

The estimate of the chair hour cost is a fundamental aspect that every dentist should take into account for their office, since from dentists who are just starting out in the labor field to dentists with years of experience, they will need to take this aspect into account for their office to be successful [2]. The dental services that are going to be offered depend on many factors, and this directly influences the time dedicated to each of the patients. These services range from simple treatments to more complex treatments that increase the time in which the patient goes to the consultation. This aspect, added to the knowledge of the previously specified administrative area, provides us with the appropriate guideline to determine the appropriate and fair price for the patient and the professional [1]. Cost analysis provides support to evaluate and define decisions, also to monitor and measure performance [2]. Therefore, the objectives of this study are to determine the chair-hour cost in dental offices in the City of Cuenca and provide the information and methodology that must be followed to know the monthly costs, both fixed and variable, based on the actual costs of materials and instruments used.

2. Materials and methods

This article is an analytical-observational research study in which the average cost of the dental chair-hour in care provided by 70 dentists in the city of Cuenca will be determined. For this, a survey was used to obtain information on: cost of salary, working days per month, hours of service per day, monthly rental of the office, payment of water and electricity, investment used to purchase the chair, compressor, ultrasound, curing lamp, autoclave. This was done through tours of all areas of the city of Cuenca where the different clinics were chosen randomly. Once the 70 dentists were consulted in their respective offices and the information was obtained, the data was tabulated in a Microsoft Excel file and the following formulas were applied:

To calculate the cost per hour of human resources, the following formula is used:

$$HC\ RR.\ HH = M.S / WP\ M / DS\ H$$

- HC RR. HH: Cost per hour of human resources.
- M. S: Monthly salary.
- WD M: Working days per month.
- DS H: Daily service hours [1].

To calculate the cost per hour of equipment, instruments, furniture, infrastructure, etc., the depreciation time must be considered, considering that the depreciation time is 6 months. The equipment chosen for the application of the formula are: dental chair, compressor, ultrasound, photocuring lamp and autoclave.

$$CHEIFIFO = PP / MD / WD\ M / DS\ H$$

- CHEIFIFO: Cost per hour of equipment, instruments, furniture, infrastructure and others.
- PP: Purchase price.
- MD: Months in which it depreciates.
- WD M: Working days per month.
- DS H: Daily service hours [1].

To calculate the hourly cost of the services, the use or consumption of the basic services used in the daily consultation, such as water and electricity per month, must be considered:

$$HCS = MC\ F / WD\ M / DS\ H$$

- HCS: Hourly cost of services.
- MC F: Monthly consumption form.
- WD M: Working days per month.
- DS H: Daily service hours [1].

To calculate the hourly cost of the dental chair, the following formula can be used:

$DC. H = (\text{fixed costs} + \text{variable costs} + \text{annual return}) / (W.D. M * D. S. H)$. Where the annual return can be calculated with values between 8%, 10%, 12%.

- DC. H: dental chair-time.
- WD M: Working days per month.
- DS H: Daily service hours [1].

Therefore, the objectives of this study are to determine the chair-hour cost in private dental offices in the City of Cuenca in the year 2023 and provide the information and methodology that must be followed to know the monthly costs, both fixed and variables, based on the real costs of the materials and instruments used.

3. Results and discussion

After the pertinent studies of the 70 clinics in the city of Cuenca, we have been able to determine the following results when applying the formulas.

Fixed costs must be calculated per hour of care: for example, the calculation of human resources, equipment, instruments, etc. In the present study, the value of fixed costs is 7.57 dollars, after considering the human resources, equipment and instruments acquired by the dental professionals in the private practice (Table 1).

Table 1 Fixed costs

Cost per hour of human resources	CHRRHH: 679.81/25/8=3.39
Cost per hour of equipment, instruments, furniture, infrastructure	CHEIMIFO: 4920/6/25/8=4.18
TOTAL:	\$7.57

Authors

On the other hand, we have variable costs which are calculated based on the monthly use of services. In the present study, the value of variable costs is 0.21 US cents, after considering the monthly expenses for electricity and water in the private practice (Table 2).

Table 2 Variable costs

Cost per hour of services (water and electricity)	CHS: 42.77/25/8=0.21
TOTAL:	\$0.21

Authors

The sum of the fixed costs plus the variable ones determines the total cost of monthly expenses. Knowing the previous values, the cost of the chair hour can be calculated as follows:

Table 3 Chair hour cost of dental offices in the City of Cuenca

Fixed costs	\$7.57
Variable costs	\$0.21
annual return	10%
Working days per month	25
Hours worked per month	8
TOTAL:	\$2.13

Authors

The estimated chair-hour cost in the city of Cuenca is 2 dollars and 13 cents, which is a really considerable value, since a dental diagnosis costs approximately between 5 and 10 dollars. Therefore, no dental treatment that requires the use of the chair should cost less than 2 dollars to avoid negative values in the monthly profit of the dental office.

In the study by Carpio et al., which evaluated the chair-hour cost of the School of Dentistry of the University of Cuenca, a chair-hour cost of 3 dollars and 6 cents was determined; value that differs with our results due to the diverse methodology of the application of the formulas of said study, in addition to the fact that the expense by the public entity is greater thanks to the large number of armchairs, high demand for professionals, guards, etc. [2]. On the other hand, in a study carried out in Madrid by Bedoya et al, in which the unit value of each dental treatment was determined, it was observed that in 4 of 10 activities the rates were below the normal reference costs [4]. . The economic reality has an impact on the lifestyle of people, carrying out a situational analysis on income and expenses allows evaluating the areas where expenses can be reduced and justifying the increase in costs. When carrying out the cost analysis, it is avoided placing rates that do not represent a profit for the dentist and his clinic, avoiding negative economic and psychological impacts as identified in the study by Aguilar et al [5]. Finally, in a study by Mori JC et al, in their thesis it is determined that it is essential to know the production costs of a company to have a broad knowledge of the profit of a company, as well as the losses generated in them [6].

4. Conclusion

Our study concluded that the cost of a dental chair-hour charged in dental offices in the city of Cuenca is \$2.13, a price that includes supplies such as: dental chair, compressor, ultrasound, curing lamp and autoclave used in clinical care. However, it is also required to analyze costs based on biosecurity materials, internet use, security cost and materials used; which will mean an increase in the hour-chair cost. As previously stated, knowledge of dental consultation costs, such as chair-hour cost, are necessary concepts in the administrative area so that health professionals have fully satisfactory efficiency in their offices, as well as better management of profits and losses. Finally, it is important to consider that this article presents certain limitations, such as determining the value of the consultation for the provision of specialized services, so the cost of the chair hour will vary depending on the dental treatment performed on the patient. Therefore, it is necessary to replicate this study methodology in various scenarios to obtain more information on a subject that is little known by the dentist.

Compliance with ethical standards

Acknowledgments

We thank all the dental colleagues who supported us with the collection of information necessary to carry out this investigation. In addition, we want to thank our relatives for the moral support provided.

Disclosure of conflict of interest

There were no major conflicts of interest during the performance of this article.

References

- [1] Carpio, K. Estimation of the dental chair-hour cost in the Faculty of Dentistry of the University of Cuenca. Faculty of Dentistry, University of Cuenca, Ecuador. 2022. doi: <https://doi.org/10.30574/wjarr.2022.15.1.0702>
- [2] Garcia, M. Design of a cost system for basic and specialized dental care in the Dentistry area of the Quito Villa Flora Lions Club Medical Center, in the Semester from July to December 2013. <http://www.dspace.uce.edu.ec/bitstream/25000/4608/1/T-UCE-0006-34.pdf>
- [3] Castillo D, Correa K, Barzallo J, Loarte G. How to estimate the cost of the chair hour in the dental office? Teaching Didactic Contribution Article. OACTIVA Magazine UC Cuenca. 2019; 4(3):43-46
- [4] Bedoya L, Salazar Y. Design of a cost model based on the ABC methodology for dental services in the city of Tulua. [Research thesis]. Tulua: Valley University; 2015.
- [5] Aguilar F, Borie J. Economic impact of the free diagnosis for the Dentist in the private practice of the profession, in the metropolitan region during the year 2019. [Research thesis]. Santiago de Chile: Development University; 2019.
- [6] Mori JC. Cost analysis and fee proposal for bracket recementation in the private practice OdontoSalud SRL. [Research thesis]. Trujillo: National University of Trujillo; 2017.