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Cost analysis for ophthalmic clinics services

Análise de custos para clínicas oftalmológicas

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ABSTRACT

Purpose: *To present a model of cost allocation for ophthalmic clinics services using cost versus price approach and to evaluate the cost information as a management tool as well as an instrument for cost control and decision-making.* ***Methods:*** *The model was tested applying various costing methodologies: absorption costing, full costing, direct costing and activity based costing. Cost allocation systems were installed in three ophthalmic clinics services with the objective of arriving at the cost of procedures conducted in the period september to november of 2003; data was obtained through financial and management reports and field interviews with staff.* ***Results:*** *The costing system met its objectives: the larger ophthalmic clinic demonstrates a better cost-benefit relationship given its larger volume and variety of procedures and distribution base to spread its fixed costs. With regard to the cost-charge ratio some procedures were found to be profitable and others with low or negative operating results, illustrating the need for cost control to determine profitable services as well as pricing.* ***Conclusion:*** *The proposed model is advantageous for both disseminating and utilizing cost information as well as providing support for management in its decision-making and negotiating activities with potential buyers.*

Keywords: *Costs and cost analysis; Eye health services; Ophthalmologic surgical procedures/economy; Critical pathways/economy; Health expenditures*

RESUMO

Objetivo: Avaliar a aplicação de um modelo de apuração de custos dos serviços prestados em clínicas de oftalmologia, fazendo um estudo comparativo de custos *versus* preços. E avaliar a informação de custos como ferramenta de gerenciamento, controle e tomada de decisão. **Métodos:** Para testar o modelo proposto, foram adotados os conceitos das metodologias de custeio: por absorção, pleno, direto e baseado em atividade. Procedeu-se a implantação do modelo em três clínicas de oftalmologia selecionadas a fim de se apurar o custo dos procedimentos realizados no período de setembro a novembro de 2003; os dados foram coletados por meio de análise dos relatórios financeiros, gerenciais e entrevistas com funcionários. **Resultados:** A aplicação do sistema de custeio proposto é exequível: a clínica de maior porte mostrou-se como a melhor relação custo x benefício, tendo em vista a disseminação dos custos fixos diante da diversidade dos serviços realizados. Quanto à relação custo *versus* preços constataram-se procedimentos rentáveis e outros que geram resultados pífios ou prejuízos, enfatizando a necessidade de controle de custos para a avaliação dos serviços mais rentáveis e utilizá-lo como balizador de preços nas negociações. **Conclusão:** O modelo proposto é aplicável com vantagens, na medida em que contribui para a disseminação e utilização das informações de custos, apoia no gerenciamento e controle operacional e gera informações preponderantes nas negociações junto aos tomadores de serviços.

Descritores: Custos e análise de custos; Serviços de saúde ocular; Procedimentos cirúrgicos oftalmológicos/economia; Procedimentos clínicos/economia; Gastos em saúde

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Introduction

In recent years, extraordinary advances were made in medicine. Innovative diagnostic techniques have emerged to identify (at very high cost) problems that previously remained hidden. There are new (and expensive) healing therapies, and modern (and also expensive) surgical techniques to prolong the life of patients who recently had zero expectation of survival. Health professionals were never so specialized. Thanks in part to medicine the world is getting older. They are fantastic advances for humanity. But, how much is society willing to pay for it?[1]

These scientific and technological advances have brought strong impacts, resulting in increased survival of human beings. On the other hand, a great reflection in health costs was observed. [2]

The progress achieved by medicine did not have the same impact in the management of healthcare organizations. "Is hospital management in Brazil long overdue?" [1]

The sector is going through a time of great changes and high competitiveness, which raises concern about prices and with the composition of the costs in pursuit of profitability.[3]

The major challenge of health institutions consists in seeking a new management model involving doctors in administering and incorporating new management and control techniques. However, health institutions in the country having some knowledge of their cost structure are rare in order to establish the price of the services provided. [4]

In environments of high competitiveness, the need of managerial tools becomes imperative, and the cost system plays a primary role in this scenario, not only with the objective of knowing the cost of services, but also serving as a management tool. Among other valuable management information provided by cost data, one can assess the operational results; make decisions about investments; calculate the use of idle capacity; and analyze the clientele.[5]

The limitation of resources, business competition in the health sector, offer of an increasing number of services and options to costumers, increase the need for professionals to keep up to date about the technical concepts, but also to enhance their knowledge in relation to managerial tasks.[6]

"Healthcare companies need people who know the medical field, but also who know how to rationalize costs and define the market.[7]

The situation in the area of health, requiring control instruments, puts the cost information as an essential tool for survival facing the competitiveness of the sector, in which the prices are determined by the market, and the only way to survive is managing costs.[3]

Considering the scarcity of literary information and even practice in this segment, this work aims to evaluate the applicability of adopting a model to calculate the costs of the services provided in Ophthalmology clinics that:

a. Manages the information of costs of the procedures;
b. Provides relevant information for price negotiation;
c. Is used as an instrument for cost control and analysis;
Supports the decision-making process

Methods

The present study proposes the implementation of a model to calculate costs of the procedures and the analysis of its feasibility in three ophthalmological clinics. To this end, we used the concepts of costing methodologies by absorption, full costing, direct costing and activity-based costing, and proceeded to the adequacy of information according to the management, control and decision-making needs.

For the development of the study, we selected three ophthalmological clinics in the city of São Paulo, with the following characteristics:

Clinic 1 offers all subspecialties, clinic 2 does not offer the subspecialties Orbit and Onco-Ophthalmology, and has no surgical center. Clinic 3 is linked to a hospital that has a service directed to patients from SUS (Single Health System), offering all subspecialties. The big difference between this clinic and the previous ones is the use of the facilities of a hospital, and sharing the use of the ambulatory and the surgical center with other medical specialties.

Table 1
Clinical characteristics

Quantity	Doctors	Employees	Officer	Operating rooms
Clínic 1	7	25	5	2
Clínic 2	15	14	4	
Clínic 3	8		2	

The choice for the clinics listed above was based on the feasibility of the methodology to calculate costs in different types of clinics, namely:

1. Clinics offering all subspecialties and having a Surgical Center;
2. Clinics not having a Surgical Center;
3. Clinics linked to hospitals that treat patients from SUS (Single Health System)

After defining the requirements above, the three clinics mentioned were selected following some criteria:

- Availability, access and interest:
- Controls and departmental structure:
- Data reliability:

It was also necessary to see if the clinics controlled the routines of care carried out, or if it would be possible to deploy them from the arrival of the patient to the final care, since the calculation of the cost involves the whole process.

The methodology used consisted of activities developed by the clinics, in which the employees involved in the process were trained to collect information every month. Subsequently data was processed in a spreadsheet (Microsoft Excel).

The data presented was collected during the period from September to November 2003 using interviews with staff, analysis of monetary and non-monetary reports from accounting, managerial and statistics information, and on-site observations.

It is important to note that the choice of clinic 3, which is linked to a hospital, had a precondition: that it had the a cost calculation methodology with the statement of all costs allocated to the ophthalmology ambulatory.

In the clinics to which we had access, and that corresponded to the requirements proposed, the following exclusion criteria was used:

- Lack of interest or distrust of the manager in carrying out the study;
- Lack of an administrative professional willing to monitor and collaborate in the collection of information;
- Lack of minimum controls: notes from atendances, control box with distinction between spending of the clinic and partners, economical, financial and extra-accounting info records;
- Absence of a minimal organizational structure.

For the three clinics, the costs of the procedures were calculated as described:

The costs of surgical procedures were not determined, the work was limited to the determination of the cost structure of the Surgical Center, and the unit cost of time of use, measured in minutes and/or hours.

Organization and standardization of information:

To organize and standardize the analysis, the study was carried out in phases: collection of information, processing and validation of data, calculation of the costs of the procedures, and performance analysis.

1) Collection of information along with the clinics.

The work on data collection was developed in stages as follows:

- evaluation and definition of the organizational structure;
- division of cost centers among production, auxiliary and administrative, and evaluation of activities in each one of them;
- determination of the costs and expenses composition, and classification of costs between fixed and variable;
- definition of production units;
- establishment of apportionment basis of indirect costs and expenses;
- establishment of apportionment basis of support and administrative centers;
- development of data collection reports;
- collection of costs data by cost center in each of the relevant sectors related to the desired information;
- data collection of statistics, physical and clinical structure, and production.

2) Processing

After analysis and validation of the data collected, the next phase of the work consisted in the processing of information and the calculation of costs per cost center.

In order to facilitate the understanding, we developed a few steps, as follows:

a. structure of the cost spreadsheet;
b. record of direct costs;
c. apportionment of indirect costs;

This step consists in the distribution of the costs of items that are not identified directly to a cost center. The distribution of these items to the respective cost centers is carried out through apportionment criteria.

The assessment criterion is the basis on which this item will be distributed to the cost centers. The amount of the item to be shared is divided by the total criterion, tracking an index that is multiplied by the proportion of each cost center, and locates the amount of apportionment of each cost center.

d. apportionment of auxiliary and administrative cost centers;
After knowing the direct and indirect costs of each one of the cost centers, the next step is the transfer of the costs of auxiliary and administrative cost centers to production cost centers.
e. processing and calculation of the cost of cost centers;
After the recording of direct costs, apportionment of indirect costs, apportionment of auxiliary and administrative centers, we made the sum of these three components and reached the total cost of each one of the production cost centers. At this time, all the costs of auxiliary and administrative centers were absorbed by the production centers. Therefore, the sum of the production cost centers corresponds to the total costs of the clinic.
f calculation of the total and unit cost per cost center.
By simply dividing the total costs by the production unit is the unit cost of production cost centers (in this study all production units were expressed in minutes worked).
In the previous step, we found the cost of the cost centers where the procedures are carried out by setting the first step to find the costs of the procedures. The next step is characterized by the formation of the cost of each of the procedures (appointments, exams and therapies) carried out by the clinic.

3) Calculation of the costs of the procedures:

a. appropriation of the direct costs of the procedures;
The direct costs are clearly defined for each of the procedures, with emphasis on the cost of material, medicines and the fees paid to doctors and technicians for the work performed.
b. apportionment of the costs of procedure depreciation;
The appropriation of depreciation costs to the respective procedures was calculated at a rate of 10% per year, and distributed according to actual production; when the equipment performed two or more types of exams, we considered the time using the same for each type of examination.
c. absorption of fixed costs;
The absorption of fixed costs (structure) for procedures performed was distributed to the proportion of time used for services performed.
d. calculation of the costs of the procedures.
After the allocation of variable and fixed costs (direct and indirect), and the sum of these items and dividing them by the total number of procedures performed, we reach the unit cost of the procedure, finishing the step of calculation of costs.

4) Evaluation and analysis of performance:

a. calculation and evaluation of the contribution margin;
b. definition of the break-even point;
c. comparison between price x cost;

Results

Table 1
Costs of cost centers: offices and exams

Clínic 1		
Description	**Offices**	**Exams**
Direct Costs		
Doctor's fees		
Exams		30.991
Appointments	22.319	
Subtotal	*22.319*	*30.991*
Material Consumption		
Medicines	321	1.202
Medical material		912
Subtotal	*321*	*2.144*
Costs and general expenses		
Depreciation Product. Equip.	1.978	2.688
Subtotal	*1.978*	*2.688*
Total direct costs	**24.617**	**35.793**
Indirect costs		
Accounting	353	514
Sefety	1.121	411
Equipment Maintenance	972	916
Building Maintenance	237	87
Rent of the building	2.723	1.000
Eletricity and water	565	469
MPT and Commercial license	1.278	469
Subtotal	*7.249*	*3.865*
Total Direct + Indirect	**31.867**	**39.658**
Common areas	1.463	1.819
Administration	3.084	4.484
Computing	1.198	958
Telephony and reports	2.146	195
Maintenance /cleaning	1.780	654
Reception	9.117	12.347
Tecnologist	3.153	3.702
Subtotal	*21.942*	*24.159*
Grand total	**53.809**	**63.817**

Clinic 2		
Description	**Offices**	**Exams**
Direct Costs		
Doctor's fees		
Exams		9.701
Appointments	14.127	
Subtotal	14.127	9.701
Material Consumption		
Medicines	227	183
Medical material	105	280
Subtotal	*332*	*463*
Costs and general expenses		
Others depreciation	138	107
Productives depreciation	2.331	2.492
Subtotal	*2.470*	*2.599*
Total direct costs	**16.928**	**12.763**
Indirect costs		
Billing	458	706
Surveillance	755	371
Air conditioner	67	13
Rental/ building depreciation	3.115	613
Energy	252	105
Water	51	11
MPT taxas	210	41
Seguros	346	68
Subtotal	*5.254*	*1.929*
Total Direct + Indirect	**22.182**	**14.692**
Assistants apportionment		
Common areas	807	159
Annex house	35	7
Administration	4.573	3.448
Telephony	2.081	367
Reception	9.252	13.600
Tecnologist	1.768	3.767
Subtotal	*18.517*	*21.347*
Grand total	**40.699**	**36.039**

Table 2
Comparison of production of appointments and exams

Description	Clinics		
	1	2	3
Appointment	**1.360**	**809**	**1.296**
Daily Tension Curve - Binocular	5	1	
Monocular computerized campimetry	291	37	
Ocular motility exam	123	37	
Retinal mapping - monocular	457	223	244
Retinography - monocular	168	3	
Applanation Tonometry	75	254	354
Normal sub-vision - monocular	16	2	
Ultrasonic biometry - monocular	94	22	
Ultrasonic pachymetry - monocular	127	66	
Cornea specular microscopy - monocular	256	20	
Gonioscopy - binocular	14	30	
Computerized keratoscopy - Topography	143	218	
Orthoptics exercises	1	12	

Table 3
Comparison of unit costs - variable, fixed and full

Comparativo Values in Brazilian Reais (R$)

Code	Description	Unit variablel cost			Unit fixed cost			Total cost per unit		
		Clinic			Clinic			Clinic		
		1	2	3	1	2	3	1	2	3
00.01.001.4	Appointment	16.88	20.62	0,10	22.68	29.67	21.36	39.56	50.29	21.46
50.01.002.6	Daily Tension Curve - Binocular	13.59	28.16	-	20.78	39.17	-	34.37	67.33	-
50.01.004.2	Monocular comput. campimetry	13.52	30.61	-	15.82	103.86	-	29.35	134.47	-
50.01.005.0	Ocular motility exam	7.55	11.79	-	9.93	17.53	-	17.48	29.32	-
50.01.009.3	Retinal mapping - monocular	8.52	22.83	0,22	8.40	19.74	10,71	16.92	45.57	10.93
50.01.012.3	Retinography - monocular	9.05	24.49	-	7.33	293.83	-	16.38	318.32	-
50.01.015.8	Applanation Tonometry	3.00	5.05	0,10	4.16	9.34	3.52	7.16	14.39	3.62
50.01.018.2	Normal sub-vision - monocular	24.10	51.73	-	15.73	78.34	-	39.83	130.07	-
50.01.019.0	Ultrasonic biometry - monocular	16.73	20.50	-	34.98	46.46	-	51.71	66.96	-
50.01.020.4	Ultrasonic pachymetry - monocular	14.64	21.61	-	14.25	34.07	-	28.89	55.68	-
50.01.021.2	Cornea spec. microscopy-monocular	32,72	24.31	-	14.11	-	-	46.83	24,31	-
50.01.023.9	Gonioscopy - binocular	8.43	13.38	-	14.26	16.61	-	22.69	29.99	-
50.01.026.3	Computerized keratoscopy - Topography	22.39	14.65	-	27.71	16.64	-	50.10	31.29	-
50.02.003.0	Orthoptics exercises	19.62	35.31	-	6.62	20.87	-	26.24	56.18	-

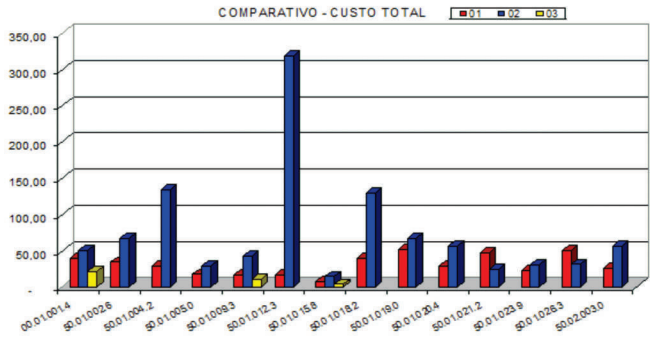

Figure 1: Comparative of total unit costs

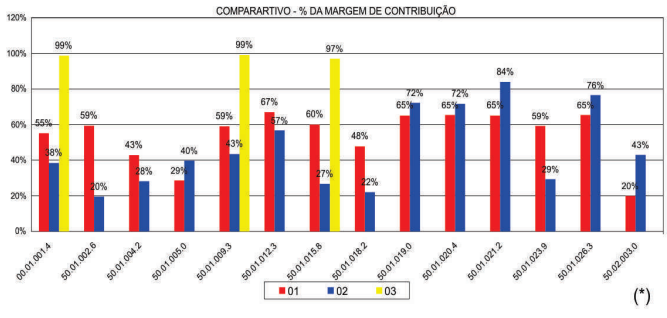

Figure 2: Comparative of the percentage of the contribution margin.

Table 4
Comparative of average unit revenue and result

Code	Description	Average unit revenue			Total costs per unit			Unit result					
		Clinic			Clinic			Clinic					
		01	02	03	01	02	03	01		02		03	
		R$	R$	R$	R$	R$	R$	R$	%	R$	%	R$	%
50.01.001.4	Appointment	37.66	33.48	7.55	39.56	50.29	21,46	(1.89)	-5%	(16.80)	- 50%	(13.91)	-184%
50.01.002.6	Daily Tension Curve - Binocular	33.44	35.00	-	34.37	67.33	-	(0.93)	-3%	(32.33)	- 92%	-	-
50.01.004.2	Monocular comp. campimetry	23.69	42.62	-	29.35	134.47	-	(5.65)	-24%	(91.85)	-216%	-	-
50.01.005.0	Ocular motility exam	10.58	19.57	-	17.48	29.32	-	(6.90)	-65%	(9.75)	-50%	-	-
50.01.009.3	Retinal mapping - monocular	20.84	40.34	24.24	16.92	42.57	10.93	3.91	19%	(2.23)	-6%	13.31	55%
50.01.012.3	Retinography - monocular	27.37	56.69	-	16.38	318.32	-	11.00	40%	(261.63)	-462%	-	-
50.01.015.8	Applanation Tonometry	7.52	6.88	3.37	7.16	14.39	3,62	0.36	5%	(7.51)	-109%	(0.25)	-8%
50.01.018.2	Normal sub-vision - monocular	46.12	66.41	-	39.83	130.07	-	6.28	14%	(63.66)	-96%	-	-
50.01.019.0	Ultrasonic biometry - monocular	47.83	73.68	-	51.71	66.96	-	(3.88)	-8%	6.72	9%	-	-
50.01.020.4	Ultrasonic pachymetry - monocular	42.38	76.35	-	28.89	55.68	-	13.49	32%	20.67	27%	-	-
50.01.021.2	Cornea specular micr.- monocular	93.55	151.32	-	46.83	24.31	-	46.71	50%	127.01	84%	-	-
50.01.023.9	Gonioscopy - binocular	20.71	18.94	-	22.69	29.99	-	(1.98)	-10%	(11.05)	- 58%	-	-
50.01.026.3	Comp. keratoscopy - Topography	64.76	62.34	-	50.10	31.29	-	14.66	23%	31.05	50%	-	-
50.02.003.0	Orthoptics exercises	24.53	62.00	-	26.24	56.18	-	(1.72)	-7%	5.82	9%	-	-

Table 5
Calculation of the break-even poin

Balance point Values in Brazilian Reais (R$)

Description	Clinic 1			Clinic 2			Clinic 3		
	Production	Balance	Variation %	Production	Balance	Variation %	Production	Balance	Variation %
Appointment	1.360	1.484	-9%	809	1.862	-130%	1.296	3.717	-187%
Daily Tension Curve - Binocular	5	6	-5%	1	4	-473%	-	-	-
Monocular Comp. campimetry	291	452	-56%	37	320	-765%	-	-	-
Ocular motility exam	123	402	-227%	37	84	-125%	-	-	-
Retinal mapping - monocular	457	312	32%	223	251	-13%	244	109	55%
Retinography - monocular	168	67	60%	3	27	-812%	-	-	-
Applanation Tonometry	75	69	8%	254	1.290	-407%	354	381	-8%
Normal sub-vision - monocular	16	11	29%	2	12	-434%	-	-	-
Ultrasonic biometry - monocular	94	106	-12%	22	19	13%	-	-	-
Ultrasonic pachymetry - monocular	127	65	49%	66	41	38%	-	-	-
Cornea specular micr. - monocular	256	59	77%	20	-	100%	-	-	-
Gonioscopy - binocular	14	17	-16%	30	91	-199%	-	-	-
Computerized keratoscopy - Topography	143	94	35%	218	76	65%	-	-	-
Orthoptics exercises	1	1	-35%	12	9	22%	-	-	-

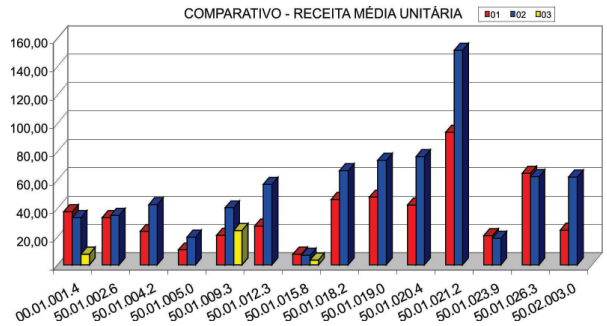

Figure 3: Comparative of average unit revenue.

Discussion

The present study highlights the importance of management information on a market increasingly pressured by high technology imposed by the sector, who lives a moment of transition and strong competition, whereby the need for investments to remain competitive is essential. On the other hand, the increasing shortage of resources conflicts the model that until now enabled excellent returns to institutions. Thus, we can infer that the medical clinics that wish to prosper in this context should opt for a management modernization process, with the adoption of professional management tools that allow accurate

and fast decision-making, or those that would inevitably have little chance of survival.

Regarding cost centers

Comparing the composition of costs between clinics 1 and 2, we can see that the costs of the cost center Offices (Table 1) have a quite similar composition, but comparing the cost centers Exams (Table 1), Clinic 2 has a fairly pronounced portion of apportionment of fixed costs (60%). The share of apportionment received from the cost center Reception represents more than half of the apportionments for both clinics.

When we evaluate the distribution (Apportionment) of the cost center Reception of clinics 1 and 2 for the cost centers: Offices and Exams (Table 1) have a very similar value, although the production of Clinic 1 is much higher than Clinic 2. The analysis above intends to illustrate some of the possible uses of the calculation of costs as a management tool to assess the performance of the clinics.

Regarding the costs of the procedures

Knowing the unit cost, we can highlight the benefit generated by cost information, that is, supply the Clinic with key data in drawing up the price list. Although there are variables influencing the selling price, the cost information has an undeniable role in the formation of the selling price, as it raises subsidies for assessment of clients, as the volume of activities and analysis of the results provided by the sale of services.

When we compare the values of the unit costs obtained, we find many variations among the clinics.

Observing the unit cost of appointments (Table 3), we see that Clinic 3 has the lowest cost, due to diluting the cost structure of the ambulatory with other specialties and the doctors receiving a fixed amount regardless of the volume of attendances, besides attending only patients from SUS. Clinic 2 has the highest cost, basically due to the high cost of the structure and its low production.

When we observe the Computed Campimetry exam, the high value found in Clinic 2 draws attention, and is primarily due to low production. While Clinic 1 offered 291 (Table 2) exams at a fixed unit cost of R$15.82 (fifteen reais and eighty two cents), Clinic 2 offered only 37 exams at a fixed unit cost of R$103.86 (a hundred and three reais and eighty six cents) (Table 3).

For the Retina Mapping, the low cost found in Clinic 3 (Table 3) stands and is justifiable because it absorbs little apportionment of the cost structure of the ambulatory, and there is no specific remuneration for the doctor, the cost of the doctor is appropriate by apportionment, because it is a fixed value.

With the exception of Microscopy and Keratoscopy, all other exams and appointments have a lower cost in Clinic 1 than in Clinic 2 (Table 3 - Figure 1), clearly showing that a greater use dilutes fixed costs, increases productivity and therefore provides better trading conditions.

Regarding the contribution margin

An important information generated by the model proposed is the calculation of the Contribution Margin, which is determined by the value of the revenue minus the variable cost [8] without the interference of apportionment of fixed costs, which exist regardless of production. The analyses of the contribution margin enables very reliable information, because it considers only the cost effectively raised at the completion of the procedure, with emphasis on the cost of materials, medicines and fees. The result of the Contribution Margin represents how each product contributes to cover fixed costs and profit generation.[9]

The analysis of the Contribution Margin index of the services provided by the Clinic 1 shows indexes above 50%, reaching 76%; only the exams carried out by Orthoptics showed an index below 50% (Figure 2).

With the analysis of the Contribution Margin it is possible to: develop a mix of attractive services for the clinic, with emphasis on those that have higher margins and high participation in the composition of the revenue, as the Specular Microscopy and Fluorescent Retinography exams; evaluate the possibility of stimulating the procedures with high margins, but with low production, providing better coverage of fixed costs and therefore higher profit generation.

Andrade[10] comments on the coverage of fixed costs, and on the development of a composition of clients and services. However, in the development of his study there is no segregation of fixed and variable costs, a key condition for the development of an appropriate composition of clients and services targeting clinical activities for procedures with higher contribution margins and high participation in the composition of the revenue.

In Clinic 2 the situation is pretty delicate, despite the average unit revenue exceeding Clinic 1 in various procedures (Table 4 - Figure 3), only in 5 exams (Biometry, Pachymetry, Microscopy, Keratoscopy and Orthoptics Exercises) presented a favorable situation, even in comparison with indexes of Clinic 1. However, the other procedures face low contribution margins, with indexes not higher than 45% (Figure 2), with emphasis on the appointment (main source of revenue) with an index of only 38%. With a superficial analysis we can conclude that this situation occurs primarily by the low production in various exams carried out (examples: Visual acuity = 5, Retinography = 3, Sub-Normal Vision = 2, etc). The same happened with appointments. If we consider the 4 existing offices having an appointment every twenty minutes we will have: 3 appointments per hour in each office. Considering 8 working hours per day (3 x 8 = 24 then, 24 x 4 = 96), estimating 22 working days per month it will be 2,112 monthly appointments (96 x 22 = 2,112). The average production of 3 months analyzed resulted in 809 appointments, that is, only 38% of production, therefore, idleness of 62%.

Regarding Clinic 3, the analysis is jeopardized, as practically there are no variable costs, with indexes of Contribution Margin greater than 93% (Figure 2).

Regarding the analysis of the break-even point

Regarding the determination of the production amount required for the clinic to reach the break-even point, a calculation made for each of the procedures carried out, it is important to note that before reaching the break-even point there is no generation of profit. The break-even point is also called breaking point[11], because the generation of profit only happens after the breakup of this link.

Observing the amounts necessary to achieve the break-even point of Clinic 1 (Table 5), we found that there are few cases with sharp production deficiency. For example, the exam of Ocular Motility would need to increase production in 227% to reach the break-even point, going from 123 exams to 402, and also Campimetry would need an increase of over 161 exams to reach the break-even point, which represents an increase in the production of 55%. The other items would demand only a small increase in production to reach the break-even point, including

appointments, which would reach the break-even point with an increase in production of only 9%.

In Clinic 2 the situation is a little more delicate at the moment of appointments, the clinic's main source of revenue, that to reach the break-even point would require an increase in the production of 1053 exams, going from 809 to 1862 appointments. This represents 130% increase, reaching 88% of the maximum capacity (2112 appointments), unlikely to be achieved in the short term. We can also highlight the Campimetry and Tomometry exams, which require an increase in production of 765% and 407%, respectively, to reach the break-even point (Table 5).

The analysis of the break-even point of Clinic 3 presented the following results (Table 5): for appointments an increase of 187% in production would be needed, going from 1296 to 3717 appointments to reach the breaking point, a situation impossible to achieve, because this amount is higher than the maximum capacity of production (20 minutes per appointment = 3 appointments per hour, 2 offices working 12 hours a day = 24 hours a day, with 3 x 24 = 72 appointments per day, 22 days per month, we would have a maximum of 1,584 appointments). This situation was already expected, considering the low wages offered by SUS. However, in order to carry out the exams, we found the following numbers: Tonometry - an increase of 27 exams, only 8%, would reach the break-even point. Retina mapping, in turn, was above the break-even point in 135 exams, generating a profit of 55%.

Regarding price versus cost

Many discussions take place between buyers and service providers at the time of negotiating the price. However, in the vast majority of cases there is no conceptual foundation providing concrete data for a healthy trading. The lack of cost information centers the discussion on assumptions and conjectures, without finding a favorable solution for both sides.

One of the major purposes of this study is the comparative analysis between domestic prices and the effective cost of procedures. The goal is to contribute somehow to mitigate the conflict of this scenario, providing some conceptual information, so that decisions are guided in concrete and significant data.

Regarding appointments, the average unit revenue doesn't cover the costs in three Clinics analyzed (Table 4). Clinic 1 shows a small lag, so a few comments should be made in this respect. In all the analyzes in this study, the unit revenue values were calculated by the average, with no distinction between private patients and the different types of health insurances, which provide differentiated remuneration. In addition, the comparisons between costs x average revenue did not include taxes imposed on the revenue, and no profit margin was considered.

Other factors should be considered in this kind of analysis. Clinic 2, for example, has an average unit loss of 50% (Table 4), however it has a high clinical idle and additionally has an average unit revenue lower than Clinic 1.

Regarding Clinic 3, the situation is very critical due to the level of remuneration of the public health system.

Regarding exams, we can observe a variability of situations, some have good results, while others a strong lag (Table 4). The Pachymetry and Keratoscopy exams, for example, have margins exceeding 20% in Clinics 1 and 2, the Retinal Mapping provides a margin of 55% to Clinic 3 (even being paid by SUS), 19% to Clinic 1, and a small loss to Clinic 3 (-6%) due to the high value of transfer fees for this exam. However, we found cases with severe lag, with Campimetry, Ocular Motility, Gonioscopy exams presenting deficient indexes in Clinics 1 and 2.

The author mentions that due to the loss results of the Campimetry exam, the Clinic made the decision of taking this exam out of the list of procedures offered and giving the equipment on loan to a local hospital.

There is need of great development and creativity in negotiations between buyers and service providers in order to alleviate or correct the imbalances exposed. However, decisions should be based on reliable information. And each institution (clinic, doctor's Office or hospital) must meet their costs, based on clear and objective concepts, in order to negotiate their prices safely. After all, each institution has its profile and its particularities, and prices should not be uniform at all situations, regardless of the region or city. Each clinic may offer differentiated services impacting directly on the costs. It is up to the market to decide whether to pay the price, and it is up to the clinic to manage their activities professionally until reaching the break-even point between quality and fair price, enabling their business and thriving.

Martins[12] states that collective negotiations are better than individual negotiations. This statement has an ingredient of questioning, because while trading methodologies, standards, model contracts, among others, it is excellent that the negotiations go along with each other. However, when the focus is entirely on the price, maybe the individual negotiation is the best way for both sides. Standardized prices may benefit some clinics that have simple structures and are directed to a certain type of clientele, but may harm other clinics with strongly differentiated structures to satisfy clients with high demands. Not to mention the regional differences in the country, causing huge differences in the cost of living, especially for the wage level that directly impacts the cost of the clini

Conclusion

The results obtained showed that the application of the model reached the objectives proposed, generating relevant information in the context of practical use of information, subsidizing the clinics with data, with regard to the management of costs incurred in each sector, providing the manager of the sector with effective planning and control of costs.

The comparative analyses between the clinics allowed the detection of the influence of costs in the economic-financial performance of each one of them. The separation of the fixed and variable costs made it clear where the greatest discrepancies occurred, and found that idleness has strong influence on fixed costs.

The comparison between costs and revenues makes it clear the importance of a cost calculation instrument at the time of negotiation, providing the clinic with necessary information. We reached the conclusion that the model has achieved its purpose well in this regard, and can serve as a reference and stimulus for various institutions to develop their cost information and to obtain consistent data to make a conscious and rational negotiation.

The methodology used for the calculation of costs proved to be feasible and suitable for application in ophthalmology clinics, and provided the generation of information for different levels of interest. Thus, the cost per cost center is relevant for the cost center manager in the planning, management and control of

operations; whereas the calculation of the contribution margin is an important instrument for the commercial and financial area of the clinic to develop a profile of clients and services providing the best return. Yet, the range of the unit cost for service provided, a key information in the process of negotiation and in the formation of the selling price.

Final comments to the conclusion

It is notorious the importance of a good cost calculation tool in the management of healthcare companies. Therefore, this paper seeks to contribute to the growth and sustainability of eye clinics, giving a new tool to support the management. This way, the present study instils the idea of a clear vision based on irrefutable conceptual elements, and seems to be useful not only for service providers (that sells without knowing the actual cost), but also for the buyer (who pays without knowing the true value), developing a new milestone in negotiations, which are so troubled these days. By broadening the potential scope interested in the results of this study, we can draw the attention of professional associations such as: Sociedade Brasileira de Administração em Oftalmologia (SBAO), Conselho Brasileiro de Oftalmologia (CBO), Cooperativa Estadual de Serviços Administrativos em Oftalmologia (COOESO) among others, when discussing and fighting in defense of the class. Invariably, these bodies lack instruments of conceptual bases to support their pleas. Besides providing comparability subsidies between clinics by the time many of them deploy a homogeneous cost calculation methodology.

The present study also provides a scientific contribution, besides being a pioneer in the cost study when the focus is directed to ophthalmology clinics. Aside from the practical aspects listed in the item about the applicability and usefulness of costing methods used simultaneously, the results of this study may be useful for more significant aspects of scientific nature, expanding the basis for studies related health costs

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