



Original Research Article

Costs of dental rehabilitation: State policies to reduce inequalities

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In Latin American countries, oral health is seen by health's authorities as a luxury good because of the high costs for health system. In Argentina 33 % of population had lost teeth when they reach young adults age. To determinate the cost either in public or private sector of a dental health care program for population with severe dental problems. We conducted a prospective study where dental health status, type of prostheses, cost of prostheses, quality of life and patient's socio-economic conditions were considered variables. Patient's selection was randomized performed among volunteers with dental pieces missed. Two groups were considered: patients in whom prostheses were provided by a public program (group A); and another group where prostheses were accessed in the private sector. The average cost to provide prostheses and oral rehabilitation per patient was € 1785.38 in the private sector while for the state program was € 268.51, which meant over 85% of saving. High satisfaction of users and an increased self-confidence of patients were achieved. This paper evidences a low-cost State program that reduced 85% the regular prices for dental prostheses. This experience can provide the groundwork for massively increase access to oral health care.

Key words: Access, dental care, cost , prostheses, dental public health, oral rehabilitation, economic evaluation.

INTRODUCTION

Many of the oral diseases are preventable with good dental council and a change of oral hygiene habits (Schwarz, 1996). However, the delay of personal preventive actions and public policy strategies causes severe dental problems that end in loss of dental pieces.

In many Latin American countries, oral health is often seen by members of the society and also by health's authorities as a luxury good, since there are many other diseases that may compromise life (Petersen, 2003) and Brenes and Sosa, 1986).

It is not unusual then that young adults, lack dental pieces. In Argentina data shows that 33 % of population had lost teeth when they reach young adults age (Petersen, 2003).

Lack of teeth in young people no only is a health problem but also is a social problem that might marginalizes this population.

Hence, oral disease is not only a problem for individuals, but also for society and the public health system (Schwarz, 1996). However, dental treatments has high impact in health care costs, therefore becomes an economically prohibitive goods.

Access to dental rehabilitation including dental pieces missed replacement, is the associated to an aesthetic practice. Thus demand and offer for these practices are located in the private health sector, focusing wealthy people (Silberman et al., 2013); Marin et al., 2010); Llompert et al., 2010); Adriano and Caudillo (2002). Unfortunately, social vulnerable population rarely has access to those benefits (Brenes and Sosa, 1986) aspect that exacerbates the gap among the community members.

The aim of this study is to establish the differences of an oral rehabilitation program in young patients that lack teeth, regarding the costs either for the public or private

health sector providers.

MATERIALS AND METHODS

Type of study

This is a prospective intervention study. The study was developed in three phases.

Patient selection and groups of study

11,423 young adults aged from 18 to 30 years old, belonging to La Plata community, were submitted to a survey and dental examination. A patient's identification and selection was performed according to data collected. Two groups were obtained: the first one consisted of those inhabitants in who complete teeth set was registered (n=7213), and second group (n=4210) recruited residents with lacked teeth. A further randomized division was made considering a new variable: site for health care and attention (either private or public sector). 1840 public sector users with at least lack of 2 teeth were admitted as volunteers and randomly selected for "intervention" group of study (n=100). Also, a "control group" conformed by 200 hundred volunteers randomly selected among 2370 users of the private health care sector, in which lack of teeth (with or without oral prosthesis) was detected at the moment when the study began.

Tools for data collection

All volunteers were submitted to a general interview and a quality survey before and after the program.

Variables selected

Variables explored in the study were age, sex, educational level, social and economic condition, employment, health coverage, type of prostheses, and final cost of treatment either in public or private sector and quality of life according to survey.

Costs of treatment

Final cost of treatment was considered as an average of expenses that included three consultations prior to preparation of the oral cavity to receive the prosthesis (cleaning, removal of debris or root pieces, etc.), consultations related to placement of the prosthesis itself, and at least three visits after the placement and the cost of the acrylic or chrome prostheses itself.

Intervention

Phase two consisted in implementing the placement of prostheses. In this phase all 100 teeth missing volunteers were examined by a team of dentists belonging to the

Ministry of Health and to local public health service professionals, in order to identified number and specific location of the missing dental pieces. These individuals underwent dental treatment as an indicated by the doctors and were provide prostheses according to each case needs.

The other 200 volunteers recruited in the control group that received private attention were also submitted to surveys and examination for comparative data.

Evaluation

The third phase aimed to evaluate the program results in terms of costs and patient satisfaction with the program.

Cost analysis

The costs were analysed taking into account the average cost of a prosthesis in private health sector (market cost), and the cost of prostheses obtained in the program (program cost).

Patient satisfaction

patients were interviewed after 2 month period and also after one year period of receiving the prostheses treatment. Indicators were related to satisfaction of self-esteem, nutrition habits, interpersonal relations and personal development. A Quality of Life and Satisfaction survey developed by the National University of La Plata was performed before and after the program.

Ethical aspects

All participants had to sign an informed consent and answer a questionnaire to evaluate the history of their dental health before their inclusion in the study.

Statistical analysis

A quantitative analysis was performed considering the information obtained from the surveys, the interviews and the program data. Epi-Info 6 (CDC / WHO) software was used in the analysis. Values of quantitative variables were expressed by mean \pm standard deviation (SD). Qualitative variables were expressed by percentage.

RESULTS

The socioeconomic characteristics of the 200 patients who received prosthetic treatment by private care providers or to the group who agreed to receive prostheses offered by the public health were equilibrated in both groups.

The analysis of treatment's cost differed according to patient's group (either they received private and public health care). Data showed differences in relation with treatment average costs according to the type of prostheses received and the site of attention (private sector Table 1 or

Table 1. Costs of treatments in the private market for treatments

Type of prosthese	Number of Patients	Unit market Value (€)	Final Cost
Acrylic(< 5 teeth)	43	€161.85 ± 30.42	€ 6959.57
Acrylic(5 or more teeth)	107	€186.29 ± 40.21	€ 19932.38
Chromium(< 5 teeth)	16	€ 210.02 ± 50.85	€3360.34
Chromium(5 or more teeth)	34	€226.74 ± 78.51	€ 7709.32
Total	200	€196.22 ± 49.98	€ 37961.62

* Cost in Euros treatment through health insurance, or Social Work Payment Pocket patients

Table 2. Costs of treatments for Public health sector

Type of prosthese	Number of Patients	Unit cost of treatment*(€)	Final cost obtained by the program(€)
Acrylic(< 5 teeth)	54	€ 21.70± 19.76	€ 1171.91
Acrylic(5 or more teeth)	28	€ 27.23± 28.44	€ 762.55
Chromium(< 5 teeth)	11	€ 38.93± 11.22	€ 428.29
Chromium(5 or more teeth)	7	€ 45.74± 18.16	€ 322.34
Total	100	€ 33.40± 19.39	€ 2685.11

Table 3 . Comparative costs of treatment in private or public sector for Intervention group patients

Treatment	Number of Patients	Notional market treatment value*(€)	Potential final Cost (€)	Unit cost Public Health of treatment**(€)	Final cost by public program(€)	Difference (€ y %)
Acrylic(< 5 teeth)	54	760.7 ± 143	8740.03	21.70	1171.91	7568.08- 86.6%
Acrylic(5 or more teeth)	28	875.6 ± 189	5216.32	27.23	762.55	4453.83- 85.4%
Chromium(< 5 teeth)	11	987.1 ± 239	2310.21	38.93	428.29	1881.91- 81.5%
Chromium(5 or more teeth)	7	1065.7 ± 369	1587.23	45.74	322.34	1264.89-79.7%
Total	100		17853.82		2685.11	15168.72- 85.9%

*Potential treatment if these patients would have their treatments in private sector

**Unit cost in Euros of treatment through the program

public sector Table 2). The average unit cost for the 200 patients from private health institutions was €196.22 ± 49.98. Noteworthy, even if 96.5% members of this group had a social security; 93% of them need to paid themselves (pocket payment) at least part of their dental treatment since coverage did not included this type of therapy. The patients treated by public program had an average cost of €33.40± 19.39.

The comparative cost of treatment according to health care sector provider (private and public) can be seen in Table 3 represents represented 85% of savings .

According to patient's satisfaction survey performed by students from National University of La Plata, in patients belonging to public health program after six months of prostheses placed showed favourable results (Marin et al., 2010). Hence, 92% of responders improved their self-confidence; 48% of them considered that an enhanced of their diet, 31% of them noticed an improvement in their

interpersonal relationships and 8% decided to continue their academic studies (Llompart et al., 2010); Adriano and Caudillo (2002); (Bajwa et al., 2007); (Moreno et al., 2004).

DISCUSSION

Dental health laid between two main concepts for Society and Health's Authorities: 'Public Interest or Individual Health,' or also called as 'Public and Individual Responsibility.' In Argentina, the idea that integral dental care would likely bring about a considerable rise either in health cost and in the demand for health services prevails in health insurance and public sector sponsors (Tuominen and Eriksson (2011); Jones and Tomar (2005). To this effect, the dental practices approached by governmental actions are focused in health education and water fluoridation. However, one of three citizens had lost at least

one tooth when they reach an adult age.

Oral health care reforms that include protheses provision was considered politically and economically affordable in many countries. In the private sector the health managers developed tools for these services even if it is more expensive than public providers (Niiranen et al., 2008).

In our paper, economical analysis also demonstrated differences between private and public dental care. However, the gap is deeper than the ones obtained by other authors (Niiranen et al., 2008) especially in acrylic prostheses where the difference was 7 times more for private providers. This fact might raise the possibility that the State considers feasible to dentures for those who need it.

Conclusion

Oral disease is not only a dilemma for individuals, but also for society and authorities from the public health system. Because the lack of teeth marginalizes population and excludes them from job's opportunities; dental problem should be considered not as an aesthetic issue but as a critical health problem that must be care. However, the costs of dental treatments are high and sometimes become an economically prohibitive good in development countries¹¹. This paper evidences a low-cost State program that reduced up to 85% the regular prices for dental prostheses making these treatments available for vulnerable populations.

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Authors confirm that there are no conflicts of interest and that their only motivation for this study was to make more inclusive the access to dental health care to the vulnerable population.

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