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Cost-Effectiveness of Home Visits in the Outpatient Treatment of Patients with Alcohol Dependence

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Key Words
Alcohol dependence · Home visits · Treatment · Cost-effectiveness · Economic evaluation

Abstract
The purpose of this study was to compare the cost-effectiveness of conventional outpatient treatment for alcoholic patients (CT) with this same conventional treatment plus home visits (HV), a new proposal for intervention within the Brazilian outpatient treatment system. A cost-effectiveness evaluation alongside a 12-week randomized clinical trial was performed. We identified the resources utilized by each intervention, as well as the cost according to National Health System (SUS), Brazilian Medical Association (AMB) tables of fees, and others based on 2005 data. The incremental cost-effectiveness ratio (ICER) was estimated as the main outcome measure – abstinent cases at the end of treatment. There were 51.8% abstinent cases for HV and 43.1% for CT, a clinically relevant finding. Other outcome measures, such as quality of life, also showed significant improvements that favored HV. The baseline scenario presented an ICER of USD 1,852. Sensitivity analysis showed an ICER of USD 689 (scenario favoring HV) and USD 2,334 (scenario favoring CT). The HV treatment was found to be cost-effective according to the WHO Commission on Macroeconomics and Health.

Introduction

Alcohol dependence is a disease that causes problems in several sectors of our society. This occurs not only because the alcohol-addicted individual is affected by the disease, but also because his or her family, employers, community, and public institutions may also be impacted, either directly or indirectly [1].

In the face of the magnitude of the problems caused by alcoholism, several therapeutic alternatives have been improving clinical practice, such that more efficient and effective treatments can be developed. The problems resulting from this pathology also have a significant economic impact, a fact which is not always taken into account.

The attractiveness of a given treatment to the health care system has been increasingly measured by the cost involved [2], as the implementation of therapeutic strategies for both alleviating the suffering and improving the health of alcohol-addicted individuals has a high economic impact in the face of the scarce resources available for health care.

Economic studies related to chemical dependency are still scarce or absent in Brazil, as is the case in other developing countries.

Of note, countries with the most serious public health problems are often those that have the least resources to

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invest in solving the problem. This requires that decision-makers need not only to be better aware of clinical outcomes of a given treatment, but also to be aware which patients would be more 'expensive' and of those that would most benefit from the intervention, before they engage in the allocation of limited resources [1].

The economic evaluation (EE) is undertaken as a fundamental tool for decision making in health care, helping managers to observe the real impact of diseases on society, both in terms of harm to one's health as well as the economic consequences to society resulting from such diseases. The primary goal of such an evaluation is to assist in decision making, in order to allow for better allocation of scarce resources.

Although extremely necessary, the EE regarding chemical dependence is often disregarded, either because of the complex methodologies involved or the lack/inconsistency of data, mainly in developing countries.

In Brazil, for instance, the existing data on social costs resulting from alcoholism are more speculative than scientific, and no EE of therapeutic interventions for treating alcoholism was found in the literature.

Consequently, this article has the objective of presenting a pioneer study on the EE of alcohol addiction in Brazil, comparing the conventional outpatient treatment for alcoholic patients (CT), which consists of approaches and techniques already used in clinical practice that give good results in terms of clinical outcomes, with this conventional treatment plus home visits (HV). It is important to note that the HV, although not a practice widely used in chemical dependency, are already used in many health areas and may be an alternative treatment to decrease dropout rates and improve the quality of life of patients with alcohol dependence, their relatives and society as a whole [3].

Methods

Data on the effectiveness of both interventions (HV and CT), which were used for the EE of cost-effectiveness (CE), were obtained from a randomized clinical trial (RCT) that was performed in 2004 and 2005 [4].

Randomized Clinical Trial

The main objective of the RCT was to assess the effectiveness of the HV intervention by comparing it with a CT already adopted by the outpatient alcohol unit of the Alcohol and Drugs Research Unit (UNIAD) of the Department of Psychiatry of the Federal University of São Paulo, Brazil (UNIFESP).

Effectiveness, as defined by treatment outcomes observed under real conditions, i.e. during the patient's daily and usual life [5], considers in the analysis all individuals randomized and exposed to treatments being tested. In this case, non-adherence to treatment and nonfulfillment of protocol norms on the part of the patient should also be taken into account and considered in the analysis. Therefore, the final outcome should be either known or estimated even for those patients abandoning the treatment during the course of the follow-up study.

The sample of the RCT consisted of 120 alcoholic patients aged between 20 and 60 years who had been enrolled for outpatient treatment in the UNIAD. Those patients who were abstinent within the 30 days prior to the first interview were excluded from the study.

A special outpatient unit was established in order to specifically treat these patients so that homogeneous care could be offered for the groups to be evaluated: the control group (CT) and the experimental group (HV). An interdisciplinary team consisting of psychiatrists, nurses, psychologists, social workers, and psychology trainees were recruited exclusively for this study.

After being detoxified, all patients were randomly distributed into groups by using a random-number table. In order to avoid selection bias, the person responsible for distributing the patients did not take part in the study.

The CT course had a 3-month duration and consisted of outpatient detoxification performed by nursing, a psychiatric evaluation and 20 group sessions, which were conducted using relapse prevention [6] and motivational interviewing (MI) techniques [7].

The HV consisted of CT plus four home visits that were carried out in the beginning of the treatment and at 7-day intervals thereafter. MI principles and techniques were used during these visits in order to enhance the patient's and family's adherence to the treatment.

The main and secondary RCT clinical outcomes were the following: (a) treatment adherence (patient's participation until the end of the treatment); (b) alcohol consumption pattern (abstinence and consumption days); (c) change stage (URICA) [8]; (d) level of change readiness (SOCRATES) [9]; (e) index of problems regarding health, addiction, occupational, family, social, legal, and psychological areas (ASI) [10]; (f) quality of life (SF 36) [11]; (g) mental health of patient and family (SRQ) [12]; (h) cognitive impairments (FAB) [13], and (i) laboratory assessment of hepatic enzymes for the investigation of hepatic impairment and alcohol consumption: aspartate aminotransferase (AST), alanine aminotransferase (ALT), and gamma-glutamyl transferase (gamma-GT).

Clinical outcomes were evaluated at three different moments: the initial phase, 2 weeks after detoxification (T1); the intermediate phase, 5 weeks after the initial application and ten group sessions (T2), and the final phase, 5 weeks after intermediate application and another 10 group sessions (T3).

Inclusion criteria were based on the initial interview conducted by the main investigator of the present study. Those patients who fulfilled the criteria and agreed to take part in the study then signed a free informed consent form. Next, they were referred to detoxification and randomly distributed into the groups for initial evaluation (T1). In order to achieve the sample of 120 subjects, 388 patients had to be recruited: 233 did not attend the initial interview, 8 did not fulfill the inclusion criteria, 26 abandoned the study during the detoxification phase, and 1 died prior to the beginning of the treatment.

Economic Evaluation

The EE consisted of four distinctive and successive phases: cost and resource survey for each intervention proposed during RCT; evaluation of clinical outcome; implementation of the incremental cost-effectiveness analyses, and sensitivity analyses to test the robustness of analysis results.

The societal perspective was used in this EE [1]. All the treatments used public resources, so all costs were paid by the Ministry of Health, except for the cost of transporting the patients, which was paid for by the patients' families.

To calculate the costs of outpatient consultations, hospital admissions and laboratory tests, we used the National Health System (SUS) 2005 table of fees. For medicines, we used the table ABCFarma/2005 (official organ of the Brazilian Association of Pharmaceutical Commerce). All other costs also used the year 2005 as base. The total cost of the two programs of treatment were calculated in Real (R$).

Cost and Resource Survey

The costs were evaluated as follows: (a) medical costs: laboratory tests, medical consultations, hospitalizations, medications, and administrative expenses; (b) nonmedical costs: transportation of patients (for additional treatment, examinations, and consultations); (c) productivity costs: loss of productivity of patients enrolled in the study (unemployment and salary deductions).

A specific protocol was elaborated for surveying the resources used by the patients during the treatment period, as well as their respective costs. As no Brazilian standardized methodology exists, the protocol was based on studies of EE and social cost of alcohol abuse performed in other countries [14], but adapted to the reality of our health care environment and population.

This protocol was applied at the end of the treatment by means of structured interviews asking the patients to describe the resources used during the whole treatment regardless of whether they were related to alcoholism or not (non-medical costs, productivity costs and medical costs in other outpatient clinics or hospitals).

The resources available for the interventions under testing were based on the patients' medical records, whereas the resources for administrative expenses were obtained by the UNIAD administrative director (medical costs incurred in our outpatient clinic or hospital).

In this way, the costs were evaluated as follows: (a) medical costs: laboratory tests, medical consultations, hospitalizations, medications, and administrative expenses; (b) nonmedical costs: transportation of patients (for additional treatment, examinations, and consultations); (c) productivity costs: loss of productivity of patients enrolled in the study (unemployment or employment, salary deductions or increases due to alcoholism or its treatment).

Evaluation of the Treatment Costs

The relative costs of outpatient consultations, hospitalizations, and laboratory tests were calculated by using the USD 2005 table of fees. A 2005 ABCFarma (Brazilian Association of Pharmaceutical Market agency) table of fees for medications was used to determine the cost of drugs. All the other costs were also based on the 2005 market prices. The total costs for both treatment programs were calculated in Brazilian currency, i.e. R$. It should be emphasized, however, that USD 1.00 was equivalent to R$ 2.30, on average, in 2005.

Clinical Outcome

The evaluation of CE used alcohol abstinence as the main clinical outcome, which was characterized in this study as the absence of ingestion of alcohol in the thirty days prior to evaluation at the end of treatment. The parameter 'abstinence' is considered one of the most relevant factors in improving the physical, psychological, and social aspects of alcoholics [15].

Incremental Cost-Effectiveness Ratio

This calculation was made by using the incremental analysis of the effects and costs resulting from CT and HV treatments.

The incremental cost-effectiveness ratio (ICER) shows the additional costs necessary for obtaining one more case of abstinence when comparing one intervention to the other. It is carried out by calculating the ratio between the cost differences (CT and HV) and the difference of the clinical outcomes achieved by each one [16]:

$$ICER = [C(hv) - C(ct)]/[E(hv) - E(ct)],$$

where C (hv and ct) = cost per patient, those who began the treatment, and E (hv and ct) = index of abstinent patients at the end of treatment.

The baseline scenario considered was the percentage of abstinent patients at the end of treatment. The ICER used as the monetary parameter the total costs of all patients who had initiated the treatment (HV, n = 62 and CT, n = 58), including those who had dropped out of the study. All the drop-out patients were considered to be non-abstinent. Cost estimates of the patients were based on the average costs generated by those patients who were found to be nonabstinent despite having concluded the treatment.

Sensitivity Analysis

This analysis was also performed in order to evaluate the robustness of the findings. This type of analysis verifies the result consistency according to the modifications generated by uncertain measurements as we deal with biological phenomena [16].

The 95% CI around the outcome measure estimates observed at the end of study period in each treatment group were used as the basis for the sensitivity analysis. Two scenarios were considered, one favoring HV and the other one favoring CT.

The ICER used a 95% CI for a proportion of abstinent patients at the end of the treatment based on the upper (UL) and lower (LL) limits, thus resulting in two distinctive scenarios:

Scenario A – where home visit intervention is optimal, that is, a greater number of abstinent patients in the HV group (UL) and a lesser number of abstinent patients in the CT group (LL).

Scenario B – where home visit intervention is not optimal, that is, a lesser number of abstinent patients in the HV group (LL) and a greater number of abstinent patients in the CT group (UL).

Statistical Analysis

The descriptive analysis shows numeric variables as mean, median, quartile, minimum and maximum values, and standard deviation, whereas categorical variables are shown as absolute and relative frequencies. The distribution homogeneity regarding the categorical variables of the HV and CT groups for assessing the effectiveness of the treatment was verified by using the χ^2 test. The abstinence pattern between both groups was also compared by using the same statistical test. The changes found in the absti-

Table 1. Demographic, socioeconomic and clinical characteristics of the initial HV and CT groups

		HV (n = 62)	CT (n = 58)	Total (n = 120)	p value
Gender	male	55 (88.7)	53 (91.4)	108 (90.0)	0.626
	female	7 (11.3)	5 (8.6)	12 (10.0)	
Age	mean ± SD	44 ± 8.8	43 ± 8.5	43 ± 8.6	0.522
Race	Caucasian	44 (71.0)	48 (82.8)	92 (76.7)	0.173
	Black	16 (25.8)	7 (12.1)	23 (19.2)	
	mixed	2 (3.2)	3 (5.2)	5 (4.2)	
Marital status	single	11 (17.7)	13 (22.4)	24 (20.0)	0.978
	married	27 (43.5)	23 (39.7)	50 (41.7)	
	divorced	15 (24.2)	14 (24.1)	29 (24.2)	
	widower	1 (1.6)	1 (1.7)	2 (1.7)	
	concubined	8 (12.9)	7 (12.1)	15 (12.5)	
Educational level	illiterate	1 (1.6)	0 (0.0)	1 (0.8)	0.495
	partial elementary school	22 (35.5)	17 (29.3)	39 (32.5)	
	full elementary school	5 (8.1)	8 (13.8)	13 (10.8)	
	partial secondary school	4 (6.5)	8 (13.8)	12 (10.0)	
	full secondary school	12 (19.4)	14 (24.1)	26 (21.7)	
	partial higher education	10 (16.1)	6 (10.3)	16 (13.3)	
	full higher education	8 (12.9)	5 (8.6)	13 (10.8)	
Occupational situation	unemployed	22 (35.5)	11 (19.0)	33 (27.5)	0.488
	employee	10 (16.1)	14 (24.1)	24 (20.0)	
	autonomous worker	20 (32.3)	21 (36.2)	41 (34.2)	
	informal worker	6 (9.7)	7 (12.1)	13 (10.8)	
	retired	2 (3.2)	3 (5.2)	5 (4.2)	
	housekeeping	2 (3.2)	2 (3.4)	4 (3.3)	
Family income (minimum wage)*	1 to 2	12 (19.4)	9 (15.5)	21 (17.5)	0.957
	3 to 5	24 (38.7)	23 (39.7)	47 (39.2)	
	6 to 7	6 (9.7)	6 (10.3)	12 (10.0)	
	over 8	20 (32.3)	20 (34.5)	40 (33.3)	
Abstinence last month	abstinent patients	1 (1.6)	2 (3.4)	3 (2.5)	0.609
	nonabstinent patients	61 (98.4)	56 (96.6)	117 (97.5)	
Level of alcohol dependence	mild cases	0 (0.0)	1 (1.7)	1 (0.8)	0.310
	intermediate cases	11 (17.7)	6 (10.4)	17 (14.2)	
	severe cases	51 (82.3)	51 (87.9)	102 (85.0)	

Figures in parentheses are percentages. * Brazilian minimum wage corresponded to USD 130.00 in 2005.

nence pattern during periods T1 and T3 for each group were assessed by using the McNemar's test. A significance level of 5% was set for all the statistical tests performed in this study.

Ethical Aspects

All the participants were assured that anonymity and confidentiality would be respected, and were also informed about the objectives of the study. They were also asked to sign an informed consent form at the beginning of the study. The study was approved by the Ethics Research Committee of the Federal University of São Paulo (CEP 0271/01).

Results

Characteristics of the Initial Sample

The great majority of the sample consisted of Caucasian male patients with a mean age of 43 years who were married and had a low educational level (less than 8 years at school). Most of them were informal workers, and received between USD 390 and 640 (3–5 minimum wages in Brazil). No statistically significant difference was found between the groups (table 1). It should be empha-

Table 2. Medical costs (R$) involved in the treatment of patients who completed the study – HV and CT groups (n = 89)

	HV (n = 53)	CT (n = 36)
Laboratory tests (n procedures)		
Complete blood exam	14 (03)	0 (00)
AST/ALT/gamma-GT	204 (27)	263 (35)
Liver ultrasonography	59 (05)	59 (05)
Other exams	150 (16)	14 (04)
Total (A)	427 (51)	336 (44)
First-aid care (consultations outside the treatment)		
Primary care	7 (01)	0 (00)
Orthopedist	30 (04)	0 (00)
Detoxification/alcoholism	23 (03)	37 (05)
Total (B)	60 (08)	37 (05)
Hospitalization (days) outside the treatment		
Detoxification/inpatient*	5,348 (42)	254 (02)
Total (C)	5,348 (42)	254 (02)
Medications (quantity)		
Psychiatric	2,488 (70)	738 (46)
Vitamins	639 (50)	388 (40)
Other	871 (06)	552 (09)
Total (D)	3,998 (126)	1,678 (95)
In treatment (consultations)		
Psychiatrist	862 (114)	585 (77)
Nurse	518 (92)	369 (66)
Psychologist	378 (67)	208 (37)
Social worker	14 (02)	0 (00)
Group 1	644 (461)	429 (307)
Group 2	630 (451)	422 (302)
Family orientation group	186 (133)	105 (75)
Total (e1)	3,232 (1,320)	2,118 (864)
Home visits (consultations)		
Psychologist + social worker	4,740 (424)	0 (00)
Total (e2)	4,740 (424)	0 (00)
Other consultations outside the treatment		
Cardiologist	23 (03)	75 (10)
Primary practitioner	121 (16)	45 (06)
Dentist	28 (10)	46 (16)
Gastroenterologist	60 (08)	0 (00)
Ophthalmologist	144 (19)	53 (07)
Orthopedist	68 (09)	68 (09)
Others	189 (25)	30 (04)
Total (e3)	632 (90)	317 (52)
Total (E)	8,605 (1,834)	2,435 (916)
Administrative expenses	10,430	6,826
Total	28,868	11,579
Total per patient	544	321

* Amount spent on only 1 patient that required 42 days of hospitalization for alcohol detoxification.

sized that both groups were found to have similar sociodemographic characterization even after the dropouts.

According to the SADD questionnaire [17], the level of alcoholic dependence was considered severe for most patients taking part of the study. Regarding alcohol consumption, however, only three patients were found to be abstinent one month prior to the initial protocol. It should be emphasized that these patients had also fulfilled the nonabstinence criteria used for screening (table 1).

Clinical Outcome

Of the 62 patients who had received HV as the treatment intervention, 1.6% were abstinent (SD = 1.62) at the baseline evaluation, while 58.11% (SD = 6.27) were abstinent at the end of the treatment. The corresponding values for the 58 patients who had received CT were, respectively, 3.4% (SD = 2.39) and 43.1% (SD = 6.50). The HV obtained 44% more abstinent patients (p = 0.101). The CI of 95% was used for calculating the proportion of abstinent patients at moment T3, at which the lower and upper limits were, respectively, 44.84 and 70.48% for HV and 30.16 and 56.77% for CT.

Cost Analysis

The resources used by the patients and their respective costs are presented as follows: medical costs (MC), nonmedical costs (NMC), and productivity costs (PC).

The resources presenting the higher economic impact in terms of treatment cost were the following: 'hospitalization' (12.3%) and 'transportation' (12.8%) for the HV group, and transportation (17.8%) for the CT group, as can be seen in tables 2 and 3.

Another relevant datum was the loss of productivity, which had reached 30% of the total treatment cost in the CT group and slightly more than 20% in the HV group (table 3).

In the HV group (n = 53), the total cost of treatment was R$ 43.424 (R$ 819 per patient), 66.5% with MC, 12.8% with NMC, and 20.7% with PC. In the CT group (n = 36) the treatment had a total cost of R$ 21.680 (R$ 602 per patient), 53.4% with MC, 17.8% with NMC, and 28.8% with PC (table 4).

With respect only to the patients who concluded the treatment but failed to reach abstinence (HV, n = 17; CT, n = 12), the total costs were R$ 14,247 (R$ 838 per patient) and R$ 4,994 (R$ 416 per patient) for the HV and CT groups, respectively (table 5).

Incremental Cost-Effectiveness Ratio

ICER = [C(hv) – C(ct)]/[E(hv) – E(ct)],

where C (hv) = (43,424/53) + (14,247/17) = 819.32 (table 4) + 838.11 (table 5) = 1,657.43, and C (ct) = (21,680/36) + (4,994/12) = 602.24 (table 4) + 416.18 (table 5) = 1,018.42.

Index of abstinence at the end of treatment:

E (hv) = 0.581 (table 1)
E (ct) = 0.431 (table 1)

ICER = [(1,657.43–1,018.42)]/[(0.581–0.431)]
ICER = R$ 4,260.07

The ICER for the baseline scenario was R$ 4,260 (table 6).

Sensitivity Analysis

By using CI 95%, the following results were found (table 6); in scenario A, where the HV intervention is optimal, the additional cost to obtain one more abstinent case would be R$ 1,585.

UL (hv) = 0.705 ■ LL (ct) = 0.302
ICER = 639.01/[(0.705–0.302)]
= 639.01/0.403
= R$ 1,585.63

In scenario B, where the HV intervention is not optimal, the additional cost would be R$ 5,369.

UL (hv) = 0.449 ■ LL (ct) = 0.568
ICER = 639.01/[(0.449–0.568)]
= 639.01/0.119
= R$ 5,369.83

Discussion

Data from the international literature show high social costs resulting from alcohol abuse and alcohol dependence. In the USA, the problems related to such conditions have resulted in a social cost of USD 184.6 billion in 1998 [18]. In Scotland, this social cost was estimated to be GBP 1,071 a year [19]. In England and Wales, the cost involving alcohol abusers in terms of social and health care, loss of productivity, and criminal activities was of GBP 18 million in 2000 [20].

In Brazil, there are speculative data estimating that about 7% of the gross national product (GNP) is spent on alcohol-related problems yearly, including treatment and loss of productivity [21]. Based on the Brazilian GNP in the year 2005 – R$ 1,937 trillion [22] – the social cost resulting from alcoholism reaches R$ 135 billion per year.

Table 3. Nonmedical costs and productivity costs (R$) involved in the treatment of patients who completed the study – HV and CT groups (n = 89)

	HV (n = 53)	CT (n = 36)
Nonmedical costs		
Transportation for treatment		
One's own fuel/vehicle (km)	1,339 (4,463)	895 (2,985)
Subway (journeys)	462 (220)	441 (210)
Bus (journeys)	2,176 (1,088)	2,224 (1,112)
Subtotal (a)	3,977	3,560
Transportation for other consultations		
One's own fuel/vehicle (km)	65 (217)	12 (40)
Subway (journeys)	42 (20)	4 (02)
Bus (journeys)	216 (108)	108 (54)
Subtotal (b)	323	124
Transportation for first-aid care		
One's own fuel/vehicle (km)	4 (16)	3 (10)
Subway (journeys)	19 (09)	4 (02)
Bus (journeys)	22 (11)	0 (00)
Subtotal (c)	45	7
Transportation for laboratory tests		
One's own fuel/vehicle (km)	48 (160)	28 (92)
Subway (journeys)	12 (06)	8 (04)
Bus (journeys)	94 (47)	138 (69)
Subtotal (d)	154	174
Transportation for home visits		
One's own fuel/vehicle (km)	1,054 (316)	0 (00)
Subtotal (e)	1,054	0
Nonmedical costs		
Total	5,555	3,865
Total per patient	104	107
Productivity costs		
Dismissals	8,590	5,645
Wage reduction	260	600
Wage loss	150	0
Productivity costs		
Total	9,000	6,245
Total per patient	169	173

According to the SUS Database [23], Brazil spent about R$ 70 million in 2003 only on hospitalizations of patients who presented with mental and behavioral disorders or hepatic cirrhosis, both caused by alcohol abuse. It should also be emphasized that such figures refer to hospitalization only, being inferior to that regarding the social cost.

As alcoholism causes a great social impact elsewhere, it has been increasingly necessary to implement new

Table 4. Summarized list of costs and resources (R$) used in the treatment of patients who completed the study – HV and CT groups (n = 89)

	HV (n = 53)	CT (n = 36)
Medical costs		
Laboratory tests	427	336
First-aid care	60	37
Hospitalizations	5,349	254
Medications	3,998	1,678
Consultations	8,605	2,435
Administrative expenses	10,430	6,826
Subtotal 1	28,869 (66.5%)	11,570 (53.4%)
Nonmedical costs		
Transportation	5,555	3,865
Subtotal 2	5,555 (12.8%)	3,865 (17.8%)
Productivity costs		
Loss of productivity	9,000	6,245
Subtotal 3	9,000 (20.7%)	6,245 (28.8%)
Total	43,424 (100%)	21,680 (100%)
Total per patient	819	602

Table 5. Costs and resources (R$) regarding nonabstinent patients for calculating the ICER of the treatment in HV and CT groups

	HV (n = 17)	CT (n = 12)
Medical costs		
Laboratory tests	128	68
Hospitalizations	157	0
Medications	1,934	680
Consultations	2,224	632
Administrative expenses	3,584	1,950
Subtotal 1	8,028 (56.3%)	3,331 (66.7%)
Nonmedical costs		
Transportation	2,269	1,112
Subtotal 2	2,269 (16%)	1,112 (22.3%)
Productivity costs		
Dismissals	3,800	550
Wage reduction	0	0
Wage loss	150	0
Subtotal 3	3,950 (27.7%)	550 (11%)
Total	14,247 (100%)	4,994 (100%)
Total per patient	838	416

Table 6. ICERs obtained by baseline scenario and sensitivity analyses (95% CI), considering the percentage of abstinent patients at the end of the treatment

ICERs*	R$	USD
Percentage of abstinents – baseline scenario	4,260	1,852
95% CI – scenario A	1,585	689
95% CI – scenario B	5,369	2,334

* Value necessary for obtaining one more case of abstinence with HV intervention.

studies of such a topic by considering not only the social cost itself, but also the economic evaluation of specific interventions. These studies are rare in developing countries, and those existing in the literature are not comprehensive or cannot be reliably generalized. The importance of developing new studies becomes evident as reliable parameters and the setting of financial priorities are needed given the scarce resources available in the national health system.

The present study, which is the first in Brazil, had the objective of stimulating both the academic and public sector towards the importance of taking into account the economic aspects, as well as the economic evaluation methodologies already used in several developed countries.

Some important methodological aspects regarding the economic evaluation were considered in this study [16]: (a) the comprehensiveness of the resources and costs evaluated (DMHC, DnMHC, and IC); (b) the society's perspective; (c) the use of sensitivity analysis; (d) the use of incremental cost-effectiveness analysis; (e) real data on the clinical effectiveness of the interventions tested.

Although the findings were thought to be very relevant, this study has some limitations, which include the following: the relatively small sample; the high percentage of patients who dropped out; economic evaluation was done parallel to the RCT (one site experimental environment may be different from that of the general population); as the follow-up was short, the maintenance of the abstinence could not be assured in the long term; the main clinical outcome (abstinence) was chosen because of its significant clinical difference at the end of the treatment (44% more abstinent patients for HV), although a statistically significant difference was found at moment T2 (p = 0.009), but not at moment T3 (p 0.101), and the cost-effectiveness evaluation of this single outcome al-

lowed no overview regarding the relevant improvements observed in other areas affecting the patient's life and health as well, such as quality of life, family relationships, improved productivity, etc.

Other RCT findings show statistically significant differences between the groups (better to HV), on parameters such as treatment adherence ($p = 0.003$) and quality of mental life ($p = 0.006$) [3], which were not included in the cost-effectiveness evaluation due to their multiple outcomes. It should be pointed out that only one quantitative study of economic evaluation and multiple clinical outcomes has been found in the literature. However, such a study showed conflicting results, thus making the choice of the optimal treatment difficult in relationship to cost-effectiveness [2].

The lack of consistent data on the social cost caused by alcoholism in Brazil, as well as of economic evaluation studies, has impeded any comparison between the findings obtained in the present study and others existing in the literature. Additionally, the treatment interventions used in this study could not be compared to others, as no similar approaches exist in the literature. However, the economic evaluation regarding dependence on alcohol and other drugs has been reviewed, and evidence of decreased social costs and health impairment resulting from alcohol addiction has been shown following specific treatment [24]. One study carried out in the United Kingdom has shown that psychosocial treatments, such as motivational interview and social skills training, reduce the social cost caused by alcoholism [20].

We believe that the results obtained in the present study will be of value to our country. Estimates of the resource availability and the costs for treating alcoholism, specifically cost-effectiveness, which had never been measured, will allow decision-makers to recognize the problem adequately and to enforce strategies to minimize the socioeconomic impacts by using interventions that are relatively in low cost when compared to the social costs incurred in the absence of treatment.

According to the WHO Commission on Macroeconomics and Health, those interventions having an incremental cost-effectiveness analysis threefold inferior to the GNP per capita are likely to be cost-effective [25]. If we consider that the Brazilian GNP in 2005 was R$ 10,546.00 (about USD 4,333) [22] and the results from the present study suggest an incremental analysis of R$ 5,369.83 (USD 2,334), the HV intervention was found to be a cost-effective intervention.

A gross estimation of the treatment cost versus the social impact caused by alcoholism in Brazil, which was based on the results obtained in the present study and on the alcohol dependence index of 11% [26], shows that an investment of approximately R$ 14 billion for treating 20 million Brazilian alcoholics would be necessary. Such an investment corresponds to 10% of the annual expenses with social problems resulting from alcoholism, which is estimated to be R$ 135 billion [22].

Consequently, we can say that the cost obtained in this study for one abstinent patient is a fair one, considering that it is reasonable for public and private funds to be used in order to improve the living conditions not only of patients but also of the entire society.

Even considering the total effectiveness evaluated in the present study, an average of 67% of abstinence cases, the treatment cost would be much lower than the annual social costs.

Conclusions

The results obtained in the present study show that home visits are a cost-effective intervention. Because of the limitations of the study, however, further research studies involving both randomized clinical trials and economic evaluations should be carried out.

We believe that new studies, performed both nationally and internationally, should give priority to social costs resulting from alcohol dependence and other drugs, mainly in developing countries. In this way, it is possible that new findings can further contribute to minimizing such a problem within public health care. Also, decision-makers can use more reliable and precise information in order to optimally organize and allocate the scarce resources available.

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