






Interchangeable medicines: impact of expenses from the perspective of customers of a startup from Minas Gerais

Medicamentos intercambiáveis: impacto dos gastos sob a perspectiva de clientes de uma startup mineira

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ABSTRACT

Objectives: The objective of this study was to conduct a cost-minimization evaluation of the potential interchangeability between prescribed medications from the patient's perspective, using information from Far.me, a startup that offers individualized medication organization and delivery services. **Methods:** A retrospective evaluation was conducted with data from 15 clients of the company who had canceled their medication delivery subscription due to cost. Data from medical prescriptions were collected, and the medications that could be interchangeable were identified. The prices used were those practiced by the startup in August 2023. **Results:** The data analysis showed that the monthly costs of prescribed treatments ranged from R\$131.00 to R\$1,219.66, while the costs of potentially interchangeable medications ranged from R\$98.00 to R\$903.78. A potential savings of 9.60% to 55.00% of the monthly cost per patient was observed. **Conclusions:** Interchangeability between medications can generate significant savings for patients, varying according to the active ingredients and brands. This practice can reduce medication expenses when interchangeable options are available. Furthermore, the study highlights the importance of initiatives such as the creation of startups that offer pharmaceutical services focused on the safety, efficacy, and economy of patient treatments, considering the financial demands and vulnerabilities of patients.

Keywords: interchangeability; generic medications; cost savings; health regulation; therapeutic equivalence

RESUMO

Objetivos: Realizar uma avaliação de minimização de custos da intercambiabilidade potencial entre medicamentos prescritos, sob a perspectiva do cliente, considerando informações da Far.me, uma startup que oferece o serviço de organização e entrega de medicamentos individualizados. **Métodos:** Foi realizada uma avaliação retrospectiva com dados de 15 clientes da empresa que haviam cancelado a assinatura de entrega de medicamentos devido ao custo. Coletaram-se dados das prescrições médicas e identificou-se os medicamentos possíveis de serem intercambiáveis. Utilizou-se os preços praticados pela startup em agosto de 2023. **Resultados:** A análise dos dados mostrou que os custos mensais dos tratamentos prescritos variaram de R\$131,00 e R\$1.219,66, enquanto os custos dos medicamentos potencialmente intercambiáveis variaram de R\$98,00 a R\$903,78. Observou-se uma economia potencial entre 9,60% a 55,00% do custo mensal por paciente. **Conclusões:** A intercambiabilidade entre medicamentos pode gerar economia significativa para os pacientes, variando de acordo com os princípios ativos e as marcas. Essa prática pode reduzir os gastos com medicamentos quando há disponibilidade de opções intercambiáveis. Ademais, o estudo destaca a importância de iniciativas como a criação de startups que oferecem serviços farmacêuticos com foco na segurança, eficácia e economia dos tratamentos dos pacientes, considerando as demandas e fragilidades financeiras dos pacientes.

Palavras chave: intercambiabilidade; medicamentos genéricos; economia de custos; regulamentação sanitária; equivalência terapêutica

Introduction

Medicines account for about 40% of health expenditures and compromise 2.5% of total household income, according to data from the Family Budget Survey conducted by the Brazilian Institute of Geography and Statistics (IBGE) and published in 2019.¹ Considering the relevance and impact of health expenditures for the Brazilian population, a concept known as catastrophic expenditure is highlighted, defined as health spending exceeding 10% of household or individual income, being more prevalent among the poorest.² In this context, some factors associated with the increase in catastrophic expenditure should be emphasized, such as the presence of multimorbidity, commonly observed among the elderly population, and consequently the increased demand and use of more medicines, as well as the contracting of private health plans, which compromise the budget of many families.^{2,3}

The National Health Surveillance Agency (Anvisa), created by Law No. 9,782 of January 26, 1999, is responsible for the sanitary regulation of medicines in Brazil, among other functions.⁴ Since 1999, generic medicines have been regulated by the Agency through pharmaceutical equivalence and bioequivalence studies to ensure the quality, efficacy, and safety of these products, in addition to the rules and assumptions applied to interchangeability between reference medicines and their generics.^{5,6} As of 2014, Anvisa began to require that similar medicines also present proof of therapeutic equivalence in relation to reference medicines (Resolution of the Collegiate Board, RDC No. 60/2014).⁷ Currently, the standard in force for generics is RDC No. 753/2022⁸ and for similars, RDC No. 675/2022.⁹

Pharmaceutical equivalence is required for medicines containing the same active pharmaceutical ingredient (therapeutic molecule), in the same dosage form and quantity, with or without the same excipients. They must comply with what is specified in the Brazilian Pharmacopoeia or authorized codes.¹⁰ To demonstrate pharmaceutical equivalence between products, bioequivalence tests are necessary, which are used to evaluate the plasma concentrations of medicines in the human body.⁷

A generic medicine must have the same active ingredient, dosage form, concentration, route of administration, dosage, and therapeutic indication as the reference medicine. It can only be produced after the patent of the reference medicine has expired and cannot have a brand name.⁷ A similar medicine, however, must be identified by a commercial name or brand.¹¹ It should be emphasized that generics must have therapeutic equivalence in relation to reference medicines and are interchangeable.⁷ In this context, it is worth noting that on October 10, 2014, Anvisa published a list of interchangeable medicines, available on its website.¹² Additionally, it must be stressed that not all similar medicines have undergone bioequivalence tests and, according to Anvisa, interchangeability is allowed between a reference medicine and its corresponding generic (and vice versa), or between a reference medicine and its interchangeable similar (and vice versa).¹³ Generic and similar medicines are not interchangeable with each other.¹³

The price of medicines is regulated by the Drug Market Regulation Chamber (CMED).¹⁴ The body sets the maximum price of medicines in Brazil, both for public purchases and for consumer sales.¹⁴ It also establishes that the maximum price for generics may not exceed 65% of the price of the corresponding reference medicine.¹⁵ In this sense, the interchangeability of medicines can significantly impact the reduction of drug prices and, consequently, household expenditures, being one of the factors that directly influence treatment adherence.¹⁶ The World Health Organization (WHO) estimates that non-adherence to chronic medication treatment is around 50%,¹⁷ with several studies showing cost as one of the main reasons for non-adherence.^{16, 18, 19}

With the aim of improving medication adherence, the startup Far.me, founded in Minas Gerais in 2018, developed innovative solutions. One of its main products is the Far.me Box, a box of medicines organized in unit doses, individually packaged by day, time, and dosage, according to medical prescription. This system enables individuals to manage their medication use more easily, reducing the risk of taking the wrong medicine or missing doses. The Far.me Box operates under a subscription model, in which clients receive at home a box containing

the medicines required for 30 days of treatment. Far.me has a team of clinical pharmacists who review all prescriptions and assess parameters such as drug interactions, overdosing, dosage optimization, and others.²⁰ When interchangeable and authorized by both the physician and patient, medicines are provided in their generic or similar versions.

In this context, studies that contribute to discussions and reflections on the importance and economic impact of interchangeability in different scenarios and perspectives become highly relevant. Thus, the present study aims to conduct a cost-minimization analysis of the interchangeability of prescribed medicines, from the patient's perspective, involving a startup from Minas Gerais, and to evaluate the associated economic impact of this process.

Methodology

This is a cost-minimization analysis of the interchangeability of individually prescribed medicines, carried out from the patient's perspective, using information from Far.me, a startup that provides individualized medication organization and delivery services.

Only clients who canceled their subscription for medication delivery between August 1, 2022, and July 31, 2023, citing high subscription costs, were selected, totaling 15 clients out of a universe of 1,000 active clients.

A database was constructed in Excel, based on prescriptions issued by physicians, without patient identification. The collected data included: medicine name, monthly quantity administered, and medicine cost.

From this, an evaluation of prescriptions was performed, identifying potentially interchangeable medicines, including reference, generic, and similar medicines, here referred to as the suggested treatment. The costs of each prescribed treatment and the suggested treatment were recorded, using Far.me's prices in August 2023 as a reference.

Monthly treatment costs were calculated according to the individually prescribed quantities. The percentage difference between the monthly cost of the prescribed treatment and the suggested treatment was calculated. Individual costs were presented in

local currency (Brazilian real, 2023) along with the monthly percentage differences between prescribed and suggested treatments, both per client and overall. The data were presented in descriptive tables, showing the costs of prescribed and suggested treatments, as well as the percentage differences between them.

Since no patient data were involved, ethical approval was not required. However, the project was approved by the company and is part of the project "Regulation of prescribed medicines, costs, and access", developed within the Faculty of Pharmacy of the Federal University of Minas Gerais (UFMG).

Results

Based on data collection and analysis, it was found that the cost per prescription ranged from R\$131.00 to R\$1,219.66, while the cost per suggested treatment ranged from R\$98.00 to R\$903.78. The potential savings generated by medicine interchangeability ranged from 9.60% to 55.00% of the monthly cost per patient, with an average of 26.2% and a median of 25.19% (Table 1).

Table 2 describes the medicines and the possible interchangeability between reference medicines and their similar or generic counterparts. The average percentage difference between prices was 48.52%, ranging from, 11.11% to, 73.03%, with a median of 47.89%. Of the thirteen suggested interchanges, 92.31% were for generic medicines.

Although there is no interchangeability between similar and generic medicines, a price comparison was conducted. It was observed that generics are, on average, 45.15% cheaper than similars. It is important to note that, in some cases, the producer of the generic is the same as that of the similar, as in the case of the similar Venlift OD 150 mg, manufactured by Torrent Laboratories, and Venlafaxine 150 mg, also produced by the same laboratory. The box of Venlift OD was priced at R\$132.00, while Venlafaxine cost R\$70.00, representing a reduction of nearly 50% of the initially projected expenditure (Table 3).

It was also observed that there are differences among generic medicine prices. The average difference across three active ingredients evaluated was 25.76%, ranging from 14.29% to 42.11%, with a median of 20.88%.

Table 1. Percentage difference between prescribed treatment and suggested treatment in a unit-dose medication company. Belo Horizonte, 2023

Patient	Monthly costs		Percentage Difference (%)
	Prescribed Treatment (R\$)	Suggested Treatment (R\$)	
1	196.00	142.00	27.55
2	701.00	503.00	28.25
3	593.10	536.18	9.60
4	312.00	241.00	22.76
5	1.219.66	903.78	25.90
6	375.50	309.50	17.58
7	513.80	387.09	24.66
8	131.00	98.00	25.19
9	417.77	188.00	55.00
10	167.00	91.00	45.51
11	229.50	204.50	10.89
12	765.52	481.72	37.07
13	566.00	454.00	19.79
14	492.79	344.79	30.03
15	820.93	712.93	13.16
Mean	500.10	373.17	26.20
Median	492.79	344.79	25.19

Source: Authors' elaboration.

Table 2. Percentage differences in the substitution of reference medicines by generics or similars in a unit-dose medication company. Belo Horizonte, 2023

Product (Reference)	Presentation	Price (R\$)	Active ingredient	Type	Price (R\$)	Percentage Difference (%)
Marevan	5 mg, box 30 tb	33.00	Warfarin sodium	G	8.90	73.03
Crestor	20 mg, box 30 tb	294.44	Rosuvastatin	G	81.00	72.49
Actonel	150 mg, box 1 tb	228.00	D'orto	S	70.00	69.30
Wellbutrin XL	150 mg, box 30 tb	209.27	Bupropion	G	71.00	66.07
Glifage XR	850 mg, box 30 tb	35.00	Metformin	G	12.00	65.71
Benicar HCT	40+12.5 mg, box 30 tb	86.00	Olmesartan + HCTZ	G	40.00	53.49
Benicar	20 mg, box 30 tb	71.00	Olmesartan	G	37.00	47.89
Selozok	25 mg, box 30 tb	40.00	Metoprolol	G	24.00	40.00
Corus	50 mg, box 30 tb	13.00	Losartan	G	8.00	38.46
Puran T4	75 mcg, box 30 tb	20.00	Levothyroxine	G	13.00	35.00
Puran T4	88 mcg, box 30 tb	23.00	Levothyroxine	G	16.00	30.43
Aristab	10 mg, box 30 tb	205.00	Aripiprazole	G	148.00	27.80
Glifage XR	500 mg, box 30 tb	9.00	Metformin	G	8.00	11.11
Mean		97.44			41.30	48.52
Median		40.00			24.00	47.89

G: Generic; S: Similar; tb: tablet. Source: Authors' elaboration.

Table 3. Cost reduction achieved through the substitution of similar medicines by generics in a unit-dose medication company. Belo Horizonte, 2023

Commercial Product	Type	Presentation	Price (R\$)	Generic Product	Generic Price (R\$)*	% Difference
Daforin	Similar	20mg box 30tb	81.00	Fluoxetine	18.00	77.78
Betadine	Similar	24mg box 60tb	79.00	Betahistine	24.00	69.62
Tolrest	Similar	50mg box 30tb	98.00	Sertraline	32.00	67.35
Reconter	Similar	10mg box 30tb	18.00	Escitalopram	45.00	61.86
Lamitor CD	Similar	100mg, box 30 tb (disp)	93.00	Lamotrigine	44.00	52.69
Venlift OD	Similar	150mg box 30cap	32.00	Venlafaxine	70.00	46.97
Donaren	Similar	50mg box 60tb	87.00	Trazodone	47.00	45.98
Tolrest	Similar	25mg box 30tb	63.00	Sertraline	39.00	38.10
Valpi	Similar	500mg box 30tb	77.00	Sodium divalproate	52.00	32.47
Quet	Similar	25mg, film-coated, box 30 tb	48.00	Quetiapine	39.00	18.75
Cipide	Similar	100mg box 30tb	52.00	Ciprofibrate	44.00	15.38
Reuquinol	Similar	400mg box 30tb	01.00	Hydroxychloroquine	86.00	14.85
Mean			85.75		45.00	45.15
Median			84.00		44.00	46.00

Same presentation of the commercial product. Source: Authors' elaboration.

Table 4. Price differences among generics in a unit-dose medication company. Belo Horizonte, 2023

Product	Presentation	Laboratory	Price (R\$)	Laboratory	Price (R\$)	% Difference
Atorvastatin	10mg box 30tb	Legrand	57.00	CIMED	33.00	42.11
Esomeprazol	20mg box 28tb	Astrazeneca	91.00	Ranbaxy	72.00	20.88
Furosemide	40mg box 30tb	Neo Química	14.00	Teuto*	12.00	14.29
Mean			54.00		39.99	25.76
Median			57.00		33.00	20.88

The box of the medicine contains 20 tablets; therefore, the cost was proportionally calculated for 30 tablets. tb: tablet. Source: Authors' elaboration.

Discussion

In this study, the monthly costs associated with prescribed treatments showed substantial variation, ranging from R\$131.00 to R\$1,219.66, while treatments suggested through interchangeability ranged from R\$98.00 to R\$903.78. The potential savings reached values between 9.60% and 55.00% of the monthly cost per patient. The average difference between the prices of interchangeable medicines was

48.52%, with reductions compared to initially proposed medicines ranging from 11.00% to 73.0%.

The wide variation in costs of prescribed treatments compared to suggested treatments through interchangeability resulted in significant potential savings for patients, particularly those with chronic conditions requiring long-term treatment. This finding corroborates the conclusions of Costa et al. (2023),²¹ who emphasized the significant cost reduction associated with interchangeability, contributing

to treatment adherence and reducing the economic burden on individuals and families.

Despite initial resistance from both physicians²² and patients²³ regarding generic medicines, studies such as Guttier et al. (2016) have indicated a trend toward change over time, with an increase in the use of generics from 3.6% in 2002 to 26.1% in 2012.²³ Misinformation, both among patients and prescribers, remains a challenge to be overcome. Prescribers' reluctance to counsel patients on therapeutic equivalence and interchangeable medicines also stands out as a barrier. Promoting the use of generics in Brazil is particularly relevant, considering that in 2021, among OECD countries, generics accounted for an average of 54% of total medicine sales, reaching 80% in countries such as Germany, New Zealand, and the United Kingdom.²⁵

Considering patient savings as a central aspect associated with interchangeability, this study found that switching between laboratories for generic medicines could reduce treatment costs by up to 42%, with an average savings of 45.15% when opting for generics instead of similars. The possibility of legislative changes to facilitate such substitutions, especially when the medicines are produced by the same laboratory, should be discussed and regulated by Anvisa. Currently, legislation only allows interchangeability between generics and reference medicines. Generics and similars are not interchangeable.²⁶

The influence of the medical profession on drug selection is evident, highlighting the importance of the role of pharmacists and other health professionals in ensuring effective and accessible treatments.²⁷ The price differences between reference, generic, and similar medicines underscore the need for robust regulations to guarantee therapeutic equivalence and the quality of interchangeable medicines.

This study has some limitations, particularly the small number of medicines involved. However, it is important to note that few studies with similar characteristics have been published in Brazil. This scarcity of research makes it difficult to conduct a deeper and more reflective analysis of a topic of great importance for patients, especially from an economic perspective. Furthermore, in the pharmaceutical context, which requires constant evaluation of its

weaknesses and challenges, prescriber resistance to interchangeability stands out as a critical issue.

In this scenario, there is a pressing need to encourage and conduct additional studies with larger samples, exploring different settings such as diverse locations and the participation of different companies. Expanding this line of research will significantly contribute to a broader understanding of the challenges and opportunities associated with interchangeability, providing valuable insights for health policy decision-making.

Despite the observed advantages, such as the potential positive influence on patient adherence to prescribed treatments, challenges remain, including price variation among interchangeable medicines and the lack of interchangeability between similars and generics. These limitations may affect the choice of the most affordable medicine. Greater rigor should be applied in defining similar medicines, establishing a deadline for all similars to become interchangeable, that is, to require bioequivalence and bioavailability studies, and implementing a comprehensive policy to encourage interchangeability in the country.

The results highlight the relevance of health companies, such as the startup from Minas Gerais, which promote the rational use of medicines. These companies encourage the prescription and selection of interchangeable medicines with proven quality, aiming to reduce costs and, consequently, increase treatment effectiveness.

Conclusion

The interchangeability of medicines can reduce costs for patients and highlights the ongoing need for effective regulations, together with strategies aimed at facilitating access to more affordable medicines, while simultaneously ensuring therapeutic safety and efficacy.

Author Contributions

CQC: project conception, data collection, writing, analysis, data interpretation, and final review of the version to be published. RP and IPDG: data analysis and interpretation, writing, and final review of the version to be published. CMR: project conception, writing, analysis, data interpretation, and final review of the version to be published.

Conflicts of Interest

The authors declare no conflicts of interest.

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Data availability statement

The data will be made available upon request. The datasets generated and analyzed during the current study are available from the corresponding author upon request.

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