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Pharmacies' income and its effective factors in Iran: A cross-sectional study

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Abstract

Purpose: Financial assessment of pharmacies and the factors affecting it is an important issue in health system and pharmaceutical industry. The present study aimed to analyze the revenue of pharmacies in Iran and the factors affecting it.

Methods: In the present study revenue data of all active pharmacies in Shiraz in 2018 (*n* = 298) were gathered using a checklist. Descriptive statistics, mean difference test, correlation, and regression analysis were performed for statistical evaluation. Heteroskedasticity and multicollinearity also were checked. Stata 15 was used for statistical analysis.

Results: Average monthly income of the pharmacies was $82,879 USD (SD = 30,635). The monthly revenue of 24 h pharmacies was about $6560 higher than that of the daily pharmacies. The pharmacies founded by non-pharmacists made about $44,038 more than others, and the pharmacies located on main streets earned over $84,247 more than the ones located on side streets. Besides, the pharmacies inside or near hospitals, clinics, or physician buildings made more money than others. Correlation analysis also showed that the pharmacies' working years, the number of adjacent pharmacies, the number of OTC prescriptions, and the number of staff working at the cosmetics counters had a positive relationship with the pharmacies' income.

Conclusions: Final findings indicated that 24 h pharmacies, pharmacies located on main streets, the ones located in hospitals or private clinics and physician buildings, pharmacies with more OTC prescriptions, and the ones with a larger number of employees in the cosmetics departments had higher monthly revenues.

KEYWORDS
health economics, income, pharmaceutical cost, pharmaceutical industry, pharmacy

1 | INTRODUCTION

One of the basic needs of the human throughout life has been medical and pharmaceutical services.[1] Drugs are among the most important products of today's business in terms of impact on public healthcare,[2] and access to them is one of the main goals of all healthcare systems.[3]

Today, pharmacies are responsible for controlling, monitoring, and providing medicine to the community effectively and cost-effectively,[4] and their performance is an important factor in the success of the health system and plays a significant role in improving the health outcomes of the community. Besides, health system managers consider the performance of pharmacies in patient care as a vital factor affecting the health system success.[5,6] According to the latest statistics of the Food and Drug Administration of Iran, there are about 11,036 active pharmacies in Iran, of which 10,028 pharmacies belong to the private sector and the rest are affiliated with government organizations.[7]

In United States of America, medications sold in retail pharmacies accounted for nearly $325 billion or 10% of total healthcare costs in 2015. Net margins average 26% for manufacturers, 3% for insurers, 4% for pharmacies, 2% for pharmacy benefit managers, and 0.5% for wholesalers.[8]

Contrary to the traditional concept of pharmacy (a place for supplying and delivering drugs), pharmacies are now considered as a growing industry,[9] and the pharmaceutical industry is the second largest global industry in terms of market value.[10] According to statistics, the volume of the global drug market has increased from $887 billion in 2010 to about $1.4 trillion in 2020, suggesting a 58% growth in this market over the next 10 years.[11] In addition, over the past decades, the global pharmaceutical industry has been one of the most successful and profitable industries.[12] Pharmacy profitability is defined by pharmacy income less the cost of pharmaceuticals (without rebates or returns) purchased from a manufacturer's or wholesaler.[13]

Profitability is an important issue in the pharmaceutical industry to measure the effectiveness and success of corporate operations,[14] and pharmacies should not only provide appropriate and technically acceptable services, but must also be profitable.[15] Currently, pharmacies in the United States of America are typically work with a gross profit margin of 23%–25%.[16,17] The net income of independent pharmacies usually ranges from 3.5% (over $4 million in sales) to 4.3% ($1.5–2.5 million in sales). However, the net operating income is lower for chain pharmacies.[17] In Iran, the average profit of a private pharmacy is $33,120 per year, that is, $2760 per month. This monthly amount varies from $1631.3 (minimum) to $4894 (maximum).[18] Furthermore, the average annual income of a private pharmacy is $106,301. This income is earned by selling prescription drugs (26.1%), over-the-counter ones (17.5%), health and beauty products and orthopedic supplies (18%), and distribution costs (13.8%).[18]

According to the few studies conducted, the income of private pharmacies in Iran is closely related to the revenue from the sale of prescription drugs, OTC drugs, distribution costs, health and beauty products, and long-term repayment of drug purchases.[18] On the other hand, the increase in the price of OTC drugs has been one of the factors affecting the revenue of pharmacies in the United States,[19] increasing the sales of drugs by 5.8%.[20]

Considering the important role of pharmacies and their potential effects on public health, especially in low- and middle-income countries,[21–23] and regarding the 8% share of the pharmaceutical industry in the global health economy (in terms of its share in GDP),[24] financial evaluation of pharmacies and the factors affecting them is of particular importance.[25]

Studies on the financial management rules and revenue rising strategies in the field of pharmaceuticals can help the pharmaceutical industry and pharmacies to increase their income and sales. This issue should be given more attention especially in developing countries where the financing of pharmacies faces serious problems. Despite this issue, few studies have been done in this field worldwide, especially in developing countries and Iran. Therefore, the present study aimed to investigate the income of pharmacies in Shiraz and the factors affecting it.

2 | METHODS

The present study was conducted on 298 active pharmacies in Shiraz in 2018. Having a population of over 1.5 million, Shiraz is the fifth largest city in Iran and the medical hub of the south of the country.

The required data of the pharmacies were collected using a data collection form. The checklist was developed to extract the revenue of pharmacies and various factors affecting it. The data collection tool was designed using experts' opinions, existing literature, and a few short interviews with pharmacists. To this end, the researchers visited the pharmacies in person, and the self-declaration data collection form was completed and returned by the pharmacy officials. Collected variables included monthly gross revenue, activity type, founder specialty, ownership, founder gender, setting, location, founder age, history, number of adjacent pharmacies, OTC prescriptions, and number of staffs working at the cosmetics counters. The main variable investigated, which was also studied as a dependent variable in the current research, was the gross monthly income of the pharmacy.

To analyze the data, the descriptive statistics of the income and the characteristics of the pharmacies were first presented. In the next step, univariate analysis (t-test, ANOVA, and correlation analysis) was performed to investigate the relationships between different factors and the gross monthly income of the pharmacies. Finally, the linear regression model was used to examine the effects of different variables on gross income of the pharmacies. The dependent variable was logarithmically included in the regression model. Thus, the regression coefficients show a relative change in pharmacy revenue per change unit in dependent variables. Finally the following model was estimated by OLS method:

L monthly gross *income* = $\beta_0 + \beta_0$ Activity type
  $+ \beta_0$ Founder specialty $+ \beta_0$ Ownership
  $+ \beta_0$ Founder gender $+ \beta_0$ Setting $+ \beta_0$ Location
  $+ \beta_0$ Founder age $+ \beta_0$ History
  $+ \beta_0$ Pharmacies nearby
  $+$ OTC prescriptions $+ \beta_0$ Cosmetic staffs $+ \beta_0$

The Breusch–Pagan/Cook–Weisberg test, in which the hypothesis of zero variance is constant, was used to examine heteroskedasticity. The VIF was also used to investigate the multicollinearity problem in the model. If this value was >5, the multicollinearity problem would be a concern.

To convert Rials to dollars, the conversion rate published by the Central Bank of Iran in 2018 was used (36,635 Rials per dollar). The protocol of this research was approved by the ethics committee of Shiraz University of Medical Sciences, coded IR.SUMS.REC.1399.148.

3 | RESULTS

The descriptive findings showed that the average (gross) monthly income of the surveyed pharmacies was $82,879. Most of the pharmacies worked in the daytime (88.59%) and were private (98.99%), founding by a male person (74.16%) who was usually a pharmacist (96.98%), and located on main streets (87.92%). About 30% of the pharmacies were located in or near hospitals, clinics, or physician buildings. Other descriptive information can be seen in Table 1.

The univariate analysis showed that the monthly revenue of 24 h pharmacies was about $6560 higher than that of the daily pharmacies, which was a significant difference. The pharmacies founded by non-pharmacists made about $44,038 more than others, and the pharmacies located on main streets earned over $84,247 more than the ones located on side streets. Besides, the pharmacies inside or near hospitals, clinics, or physician buildings made more money than others. The results of the correlation analysis also showed that the pharmacies' working years, the number of adjacent pharmacies, the number of OTC prescriptions, and the number of staff working at the cosmetics counters had a positive relationship with the pharmacies' income (Table 2).

According to the results of the regression model, 24 h pharmacies, pharmacies located on main streets, the ones located in hospitals or private clinics and physician buildings, higher experienced pharmacies, the ones with more prescriptions, and the ones with a larger number of employees in the cosmetics departments had higher monthly revenues (Table 3).

The VIF was <3 for all dependent variables, and the mean value of all variables was 1.53. Therefore, the multicollinearity problem in the model was not a concern. In addition, according to the Breusch–Pagan/Cook–Weisberg test, there was no heterogeneity of variance in the model. According to the F statistic, the significance of the whole model was also as well.

TABLE 1 Descriptive statistics of general characteristics and revenue of studied pharmacies in Shiraz.

		Frequency	Percent
All		298	100
Activity type	Daily	264	88.59
	24 h	34	11.41
Founder specialty	Non-pharmacist	9	3.02
	Pharmacist	289	96.98
Ownership	Public	3	1.01
	Private	295	98.99
Founder gender	Male	221	74.16
	Female	77	25.84
Setting	Any other places	212	71.14
	Private hospital	13	4.36
	Private clinic	32	10.74
	Public clinic	5	1.68
	Physician's building	32	10.74
	Hospital or clinic nearby	4	1.34
Location	Main street	262	87.92
	Bystreet	36	12.08

	Mean	Standard deviation
Monthly gross revenue (US dollar)	82879	30635
Founder age (years)	48.04	10.28
History (years)	8.74	7.55
Number of adjacent pharmacies	1.25	0.83
OTC prescriptions	90.24	145.64
Staffs working at the cosmetics counters	0.95	0.39

4 | DISCUSSION

The present study showed that the average monthly income of the surveyed pharmacies in 2018 was $82,879, which was about 16 times the per capita GDP of Iran in that year (5203 USD).[26] The standard deviation of the pharmacies' revenue (about $30,000 per month) showed a significant difference between the pharmacies in terms of their revenues. The factors affecting pharmacies' revenue are discussed below.

According to the findings, the number of OTC prescriptions had a positive relationship with the pharmacies' revenues, and the pharmacies with more OTC prescriptions had higher monthly income. The results of various studies in Iran showed that the revenue from the sale of OTC drugs had a significant effect on the revenue of pharmacies.[18,27] The results of the study by Christensen and

TABLE 2 Bivariate and correlation analysis of factors affecting pharmacies monthly gross income.

		Mean of MGI	SD	p Value
Activity type	Daily	75,494	21,034	0.0000
	24 h	140,594	32,276	
Founder specialty	Non-pharmacist	125,550	42,670	0.0000
	Pharmacist	81,512	29,267	
Ownership	Public	87,803	32,823	0.7800
	Private	82,879	30,635	
Founder gender	Male	83,973	32,003	0.3105
	Female	79,870	26,505	
Setting	Any other places	74,126	23,058	0.0000
	Private hospital	157,553	34,191	
	Private clinic	99,018	36,926	
	Public clinic	83,426	25,602	
	Physician's building	91,359	14,579	
	Hospital or clinic nearby	97,103	26,778	
Location	Main street	84,247	31,729	0.0379
	Bystreet	73,032	20,268	
		Correlation		
Founder age (years)		0.01		0.890
History (years)		0.18		0.000
Number of adjacent pharmacies		0.23		0.000
OTC prescriptions		0. 35		0.000
Number of staffs working at the cosmetics counters		0.29		0.000

TABLE 3 Regression analysis of factors affecting pharmacies revenue.

		Coefficient	p Value
Constant		21.17	0.000
Type	Daily	Reference	
	24 h	0.4467	0.000
Founder specialty	Non-pharmacist	Reference	
	Pharmacist	−0.1015	0.245
Ownership	Public	Reference	
	Private	−0.0182	0.926
Founder gender	Male	Reference	
	Female	−0.0255	0.383
Setting	Any other places	Reference	
	Private hospital	0.4313	0.000
	Private clinic	0.1469	0.001
	Public clinic	0.0694	0.648
	Physician's building	0.1845	0.000
	Hospital or clinic nearby	0.0496	0.660
Location	Main street	Reference	
	Bystreet	−0.0750	0.052
Founder age (years)		0.0005	0.745
History (years)		0.0004	0.845
Number of adjacent pharmacies		0.0797	0.000
OTC prescriptions		0.0002	0.020
Number of staffs working at the cosmetics counters		0.1377	0.000
Diagnostic tests of model	Breusch−Pagan/Cook−Weisberg test of heteroskedasticity	1.77	0.1837
	Variance inflation factor	1.53	
Goodness of fit	F statistic	27.23	0.000
	Adjusted R^2	0.5715	

Farris[19] in the United States also showed that the increase in the number and price of OTC drugs was one of the factors affecting pharmacies' revenues.[21] According to available statistics, sales of OTC drugs constituted a major part of the sales of traditional community pharmacies, ranging from 5% to over 50% of the revenues of typical pharmacies.[2] Therefore, pharmacies' revenues would increase with the increase in sales of OTC drugs. On the other hand, due to the tendency of consumers towards self-medication, the OTC drug market outlook has remarkably changed in recent years, so that the OTC global pharmaceutical market revenue was $120,894 million in 2021.[28] Thus, the increased demand for OTC drugs and the increased number of such drugs in different countries[28,29] (currently more than 300,000 OTC drugs are available in the US market-alone),[30] have moved the OTC drug industry.[31]

In United States of America, the average gross profit was 71% for manufacturer's, 22% for insurance providers, 20% for pharmacies, and 4% for wholesalers. Those spreads show that for every $100 spent on retail pharmacies, approximately $17 offset direct manufacturing costs, $41 allocated to the manufacturer's, and $41 belong to the distribution system. The gross markup for generic drugs is lower for manufacturer's (50%) and much higher for pharmacies (43%).[13]

The number of adjacent pharmacies had a positive relationship with pharmacy revenue. The number of pharmacies in a region indicated the level of competition a pharmacy faced. Hence, more pharmacies in a region would indicate stronger competition.[32] In general, competition in all dimensions improves performance and increases efficiency. In competitive markets, manufacturer's constantly try to increase the quality of their products and services, which not only improves their market share, but also causes

customers and consumers to be highly satisfied with their products and services.[33] In addition, the density of pharmacies is usually higher near medical centers or doctors' offices. Therefore, such pharmacies are likely to have more customers and their sales and revenues will be higher as well.

The pharmacies located on main streets earned over $84,247 more than the ones on side streets. Furthermore, the pharmacies inside or near hospitals, private clinics, and physician buildings had higher monthly incomes. The results of various studies in Iran showed that the specialization of the physicians adjacent to pharmacies, professional cooperation between pharmacists and adjacent physicians, and geographical locations of pharmacies were the indicators affecting income.[18,27] In contrast, Patel et al. in India indicated that geographical location of a pharmacy was not a factor that increased its efficiency and thus its profitability.[34] The number of physicians in an area appears to be related to the total pharmacy turnover, because a pharmacy's income depends more on the number of prescriptions it receives, and thus, the pharmacy relies on the prescribers (i.e., doctors) in that area. Therefore, as the number of physicians in an area increases, the number of prescriptions received by the pharmacy increases as well, and this increases the pharmacy's income.[32] On the other hand, after their visits to doctors, patients are more likely to take their prescriptions to the nearest and most accessible pharmacies. Thus, being located on main streets or adjacent to medical centers will increase patients' access to pharmacies and can be one of the possible reasons for increasing the income and profitability of pharmacies.[32]

The results of the present study showed that the number of employees in the cosmetics departments had a positive relationship with the pharmacies' income, and pharmacies with more employees had higher monthly income. According to the pharmacists, the number of employees in the cosmetics departments, which indicated the share of these products in pharmacy sales, had a significant impact on the pharmacies' revenues ($p < 0.01$).[18,27] Previous surveys indicated that although there were large stores selling cosmetics in the United States and other countries, more than 45% of these products were sold in pharmacies, showing that pharmacies were the best place to sell health and beauty products.[35,36] On the other hand, it is often observed that staff density affects the number of customers who actually shop at a store.[11] In Japan, for example, Sadahiro found that the stores with more staff had a larger number of visitors,[37] which could possibly increase sales and revenue.

According to the findings of this study, 24 h pharmacies had higher monthly income and their revenue was significantly higher than daytime pharmacies. Increased working hours of a pharmacy could definitely increase the sales of medicine and other health supplies, and as a result, its revenue.

To the knowledge of the researchers, this study is one of the few studies conducted on the revenue of pharmacies in the world, especially in developing countries. However, one of the main limitations of this study was that the income data were collected through the self-reporting method and it was impossible to evaluate the data accuracy. Another limitation of the present study was that the income from the sale of medicine and the income from the sale of cosmetic products were included in the study as a merged variable. Of course, it was tried to control the effect of the sale of this type of products on the income of pharmacies by including a proxy variable as the number of employees in the cosmetics departments.

5 | CONCLUSIONS

It found that 24 h pharmacies, pharmacies located on main streets, the ones located in hospitals or private clinics and physician buildings, pharmacies with more OTC prescriptions, and the ones with a larger number of employees in the cosmetics departments had higher monthly revenues. Pharmacy managers can develop strategies to increase income for their pharmacies based on the current findings.

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