Review Article

Identification of Indicators for Evaluating the Financial and Economic Performance of the Pharmacy: A Systematic Review

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A B S T R A C T

Background: Nowadays, by the increasing of the pharmaceutical expenditure the health system in all countries has gone under pressure. Thus, a process must be provided to assess the financial performance of this industry as it is essential to ensure that the limited resources are spent for the best advantages. *Objectives:* This study aimed to review indicators for evaluating the economic and financial performance of pharmacies. *Methods:* A systematic literature research was conducted using seven different search engines and electronic databases (PubMed, EBESCO, Ovid, ProQuest, springer, Science Direct, Scopus) until March 2014 without any time limitation. Inclusion criteria were: articles published in English, and the studies that focused on financial or economical scopes of pharmacy services. Studies that evaluated only clinical or humanistic performance of the pharmacy without an economic and financial assessment and also studies presented in seminars or conferences and letter to editor were excluded from the study. Selected studies were examined carefully, and their results were summarized via Extraction Table. *Results:* finally, 15 articles were chosen from 1437 articles. After assessment of articles, 108 financial and economic indicators selected for evaluating pharmacy's performance. Some indicators were: current ratio, cash ratio, total asset turnover, Net Profit Percentage (NPP). Finally, the financial and economic indicators were divided into three scopes: input, process and output indicators. *Conclusion:* for evaluating pharmacy's performance, valid financial and economic indicators are required. The financial and economic indicators which had been summarized and sorted in our study can be applied by any country for codifying their local indicators.

Introduction

Last three decades, literature evidences showed that the pharmacy performance is a critical factor in the health system's success and create a considerable improvement in society health outcomes. Pharmacies are as direct providers of pharmaceutical services that offer a wide range of services and use so much of healthcare limited resource simultaneously.[1,2] The healthcare is one of the largest and fast growing industries in the world. The pharmaceutical expenditure has been extended by growth in Gross Domestic Product (GDP) and health budgets in recent years; average 15% of annual health care expenditure is allocated to GDP in developed countries. But this extension had a small effect on health indicators.[3,4] Increasing demand of the pharmacy customers has put a force on the health system of all countries, so it seems

essential to assess the financial performance of this industry to ensure that limited resources are spent for the best advantages. The necessity has made this subject as an important part of the health system.[5,6] Pharmacies are depending on financial performance data for their operations to manage costs and clinical care procedure; monitor quality services and publish information for using in inside and outside of organization. Financial management for pharmacy department is a dynamic process, which needs adaptation to environment and the other organization`s changes. So they can reach the most effectiveness in the future and meet the organization strategic goals.[7,8] Financial analysis is a systematic approach which is used to determine how well the available funds are being managed and controlled in a business. It gives an opportunity to pharmacy owners to evaluate their

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pharmacies performance, and helps them make effective decisions to improve their financial performance. Pharmacists use financial analysis as a tool when they want to evaluate financial performance of pharmacies. Three objectives for financial analysis and management in pharmacy are: (a) management efficacy assessment in pharmacy (b) certain financial trends determination in the business and (c) necessary background data provision for business mechanism's control.[9,10] Different countries use a variety of methods to organize their pharmacy services. These key methods are, collecting information from various sources in the pharmacy and developing a system for consistent reviewing these information which leads to provide an efficient and standard healthcare service. There are a limited number of literatures in Iran that consider the economic performance evaluation of the pharmacy.[11,12] The aim of this systematic review was identified indicators for evaluating the economic and financial performance of pharmacies.

Materials and Methods

The systematic review research was done in seven search engines and data bases include: PubMed and Ovid (by applying MeSH terms), EBSCO, ProQuest, Springer, Science Direct and Scopus. The search terms included a combination of the following with AND/OR: "Financial Performance", "Financial Index", "Economic Performance", "Economic Index", "Financial Management", "Financial Analysis", "Ratio Analysis", "Pharmacy", "Drug store", "Hospital Pharmacy" and "Community Pharmacy". Each database had its own characteristics which led to varying search strategies. The systematic review was carried out until the March 2014 and there is no limitation in time bound. As study design had no importance in our study so we included all study designs. The studies were entered into the EndNote X6,

and a list was generated for analysis and selection. Inclusion criteria included: articles published in English language, the studies that focused on financial or economical scopes of pharmacy services and the studies which had been conducted at pharmacy, hospital pharmacy and community pharmacy. Exclusion criteria included: Studies that evaluated only clinical or humanistic performance of the pharmacy without an economic and financial assessment also studies that published in the other languages and studies that presented in seminars or conferences and letter to editor.

We used PRISMA- statement to provided substantial transparency in the selection process of paper. The final result was 1437 papers and three levels of screening were conducted on them, by two reviewers. The Kappa coefficient was calculated via SPSS as 16 (K = 0.82). After elimination of the duplicates, 1369 articles were remained. In the first level 1302 references excluded on the basis of title and abstract review. From the selected studies, we collected 67 articles full texts. The second stage consisted of reviewing these 67 full text articles with the same criteria used in the previous stage. In the full review processing, each paper was assigned to another reviewer whose job is to confirm inclusion criteria and extract key information. Nonconformities were resolved by consensus. To control evaluation bias, assessors blinded about each other's decisions. At the end of this stage 12 articles persisted. The third stage of screening included of reviewing and searching the references of selected articles. For more comprehensive searching, we used hand searching and gray literature on financial management books which was selected from a small non-random sample of university courses curriculum and key journals which might not exist in databases. We also searched references of references from identified studies. In overall, 15 studies were retained and abstracted (Figure 1).
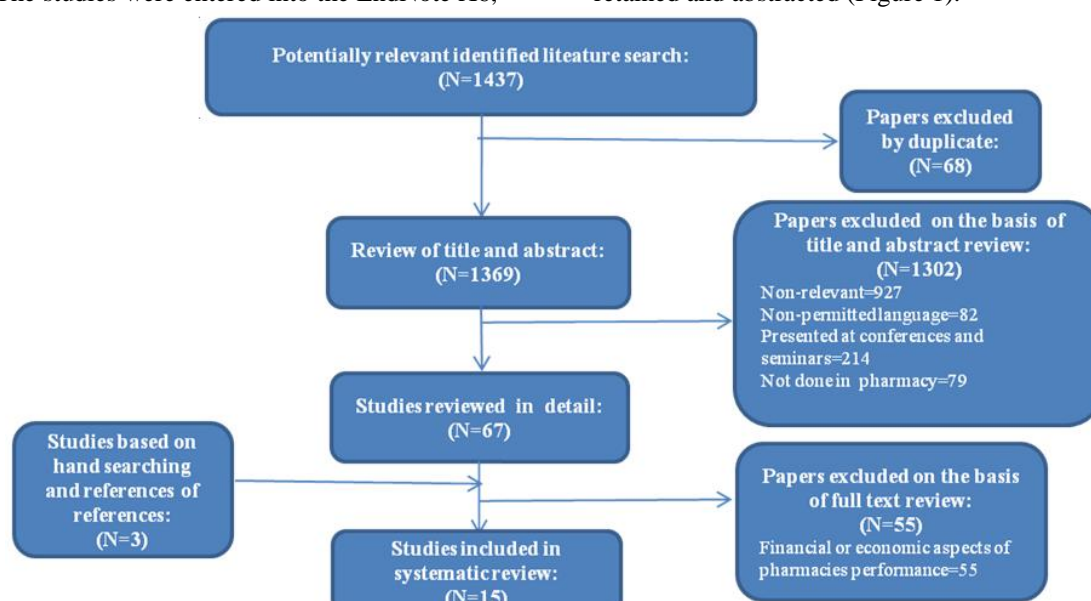

Figure1. Flow diagram of the search and selection process.

We described the final set of 15 included studies, in appendex1. The extraction of the 15 studies was based on the: author, year, location, used indicators and results of each study. Due to the excessive content of results, only some of the mentioned study indicators were presented in this table.

Table 1. Key financial indicators[1].

Input indicators		Process indicators		Output indicators	
Description	**Formula**	**Description**	**Formula**	**Description**	**Formula**
Current ratio	Current assets ÷ current liabilities	**IT**	COGS ÷ average inventory	**ROA**	Net income ÷ average total assets
Quick or acid-test ratio	(Current assets – inventory) ÷current liabilities	**Accounts payable turnover ratio**	COGS ÷ accounts payable	**ROE**	Net income ÷ average shareholder equity
Net working capital	Current assets – current liabilities	**Accounts receivable turnover**	Net sales ÷ average accounts receivable	**ROI**	Net profit ÷ (owners' equity + long term depts.)
Drug budget	Drug budget ÷ pharmacy department budget	**Break – even point**	TFC ÷ (P – VC)	**Gross profit**	Sales - COGS
Debt ratio	Total liabilities ÷ total assets	**Total Asset Turnover**	Total sales ÷ total assets	**Gross profit margin %**	(Gross profit ÷ sales) × 100
Budgeting of pharmacy	Pharmacy budget ÷ hospital budget	**Average collection period**	365 ÷ accounts receivable turnover ratio	**(Unit CM)**	Unit selling price – unit variable cost
		Average payment period	365 ÷ account payable turnover ratio		
		accounts payable to current liabilities ratio	accounts payable ÷ current liabilities		
		break-even total cost of a prescription	(cost of the drug per prescription + cost of dispense)- average prescription charge		

[1]Abbreviations: IT, Inventory turnover; COGS, Cost of goods sold; TFC, total fixed costs; VC, variable costs; ROA, Return on assets; ROE, Return on equity; ROI, Return on total investment; Unit CM, Unit contribution margin.

Indicators were divided into two financial and economic categories after performing the identification and extraction on the selected texts. In this study among the found indicators, those which grouped as liquidity, activity, debt and profitable ratios were financial indicators, whereas the others were economic. Indicators were grouped by Donabedian model (Figure 2). Donabedian model is the most comprehensive pattern in the health care assessment, introduced in 1966.

This model is including 3 steps, input (proper equipment, sufficient and expert human resources, capital and service delivery matters), process (indicates the quality of service delivery) and output or all result (including result and outputs of health care).[13,14]

Figure 2. The Donabedian Model for extracting the financial and economic indicators of pharmacies.

Results

A total of 1437 potentially relevant records were found, 15 studies were qualified to be included in our systematic review. Included studies were reviewed in detail and appropriate results were summarized and reported in extraction table. Extracted indicators were categorized into 3 scopes: input, process and output

indicators. Among the identified indicators, those were most important and repeated in most of the articles were shown in the tables 1 and 2. Others were shown in the appendix 2. The Study resulted in 108 indicators included 32 financial (30%) and 76 economic (70%). The selected studies were published from 1986 to 2013, and most important target of them was to manage the performance and find out the high performance pharmacy framework. More studies were conducted in the United States (60%) and showed the importance of such studies in developed countries. Most Indicators of financial group were situated in an output scope of 44% which suggests that this group of indicators has been focused on outputs of pharmacy's performance for sale and profitability.

Table 2. Key economic indicators[1]

Input indicators		Process indicators		Output indicators	
Description	**Formula**	**Description**	**Formula**	**Description**	**Formula**
FTE per prescriptions dispensed	Number of FTEs ÷ number of Prescriptions dispensed	**OTC cost allocation**	Total operating cost – The cost of dispensing(COD)	**Net income(loss)**	Revenues - expenses
FTE per investment	Number of FTEs ÷ requiring the investment	**Prescriptions dispensed per day**	Number of Prescriptions filled per day of operations	**Net profit**	Gross profit – expense
Energy charge	Energy costs ÷ Total cost	**Hours of operation and Staffing ratio**	hours the prescription department is open each week ÷ total number of staffing	**Net profit margin %**	(Net profit ÷ Net sales) × 100
Total personnel cost	Total personnel cost ÷ Total number of personnel	**Prescriptions filled per pharmacist per hour**	Number of Prescriptions dispensed by each pharmacist per hour	**Interest coverage ratio**	(Net income before interest and income tax expense) ÷ interest expense
Equipment cost/total cost ratio	Equipment cost ÷ total cost	**Workload**	Number of Prescriptions dispensed per day	**NPP**	(net income ÷ total sales) × 100
Average of depreciation expense	depreciation expense ÷ total expense	**Total Sales to Inventory**	Total sales ÷ inventory	**Ratio of net sales to assets**	Net sales ÷ average total assets (excluding long-term investments)
Pharmacy expenses	Total pharmacy costs ÷ number of	**profit margin of selling domestic**	(Profit of selling domestic drugs ÷ sales) × 100	**Rate earned on total assets**	(net income + interest expense) ÷ average

	patients in hospital per day Salaries ÷ number of patients in hospital per day	**drugs**			total assets
average expense of renting pharmacy location	expense of renting pharmacy ÷ 30	**Generic percentage**	Generic medication COGS ÷ total medication COGS	**Medication expense per patient day**	Annual medication cost ÷ average patient days
Total payroll per FTE	Payroll expenses ÷ total number of FTE	**EOQ**	$\sqrt{\dfrac{2(Annual\ usage\ in\ units)(Order\ cost)}{Annual\ carrying\ cost\ per\ unit}}$	**average net income gained from selling prescription medicines**	net income gained from selling prescription medicines ÷ total number of prescriptions
Total pharmacy department expense	Labor expense + drug expense	**Employee turnover**	[(personnel hired +personnel left) ÷ 2]÷personnel employed	**Sales ratio**	Department sales ÷ total store sales
Third party percentage	Third party Prescription payments ÷ total Prescription sales	**Labor efficiency**	worked hours per 100 orders, worked hours per pharmacy intensity weighted discharge, pharmacy labor expense per pharmacy intensity weighted discharge	**Total COD**	Labor cost + direct cost +allocated FC + allocated VC
		Percentage of refilled Prescriptions	Number of refilled Prescriptions ÷ total Prescriptions dispensed	**cost efficiency**	drug expense ÷ pharmacy intensity weighted discharge, total pharmacy expense ÷ pharmacy intensity weighted discharge
		total cost of a prescription	cost of the drug + cost to fill the prescription	**Average Prescription sales price**	Prescription sales ÷ number of Prescriptions dispensed
		cost of the drug per prescription	total cost of goods sold in the prescription department ÷ total number of prescriptions filled	**prescription price**	COGS + COD + profit
		average expenses of delays in insurance companies reimbursements	expenses of insurance companies reimbursements ÷ 30	**Net Functional income/cost ratio**	Functional income ÷ Functional costs (Depreciation excluded)

Prescribing errors	Identification and resolution of unintentional departure from recommended prescribing practices per patient bed day	**Net Total income/ Total cost ratio**	Total income ÷ Total cost (Depreciation excluded)
percentage of expired drugs in pharmacies	(number of expired drugs ÷ total number of drug) × 100	**GMROI**	Gross Margin ÷ Average inventory cost

[1]Abbreviations: FTE, Full-time employee; OTC, over-the-counter; EOQ, Economic order quantity; NPP, Net Profit Percentage; COD, cost of dispensing; COGS, cost of goods sold; GMROI, Gross margin return on investment.

Table 3. Main scopes of financial and economic indicators.

Financial group indicators	Liquidity ratios	Current ratio Quick ratio
	Activity ratios	Inventory turnover Total Asset Turnover Average collection period Accounts receivable turnover ratio Accounts payable turnover ratio
	Debt ratios	Debt-equity ratio Debt ratio
	Profitability ratios	Return on assets Return on equity Gross profit margin% Break even analysis
Economic group indicators	**Cost management**	Drug cost Total personnel cost Energy charge
	Efficiency	Workload Labor efficiency Prescriptions dispensed per day
	Profit/income	Net profit percentage Net income(loss) Net Functional income/cost ratio

General processes for the selection of the indicators included: collection of indicators and dividing them into financial and economical groups, and categorizing each group into 3 scopes including: input, process and output indicators. Our study`s result showed that there are two basic financial statements that we can use for detection and calculation of financial ratios: **profit and loss statement** and **balance sheet**. The profit and loss statement determines the financial performance of pharmacy, and the balance sheet, provides a view of all pharmacy assets and liabilities in a period or point in time.[15] For better presentation we sorted the identified financial indicators into four scopes and economic indicators into three in table 3.

Discussion

Financial indicators including: liquidity ratios, efficiency ratios, debt ratios and profitability ratios. **Liquidity ratios** evaluate pharmacy's ability to pay short-term debt and involving current and quick ratios. These display a ratio comparison for current assets. The greater the level is the more liquidity for pharmacy's business will be produced. **Activity or efficiency ratios** measure the way a pharmacy can manage its assets and how quickly it converts non-cash assets to cash assets. These ratios include: Inventory turnover (IT), Average collection period and Total Asset Turnover. Inventory turnover ratio indicates how rapidly inventory is sold and replaced in a pharmacy. High ratio is appreciated and means that the pharmacy can collect accounts receivable much better, with much more accessible cash. Accounts payable turnover ratio indicates how the pharmacy classifies its payments and evaluates liquidity status. Average collection period displays the average number of days needed to gather pharmacy sales on credit.[16,17] **Debt or leverage ratios** are used to analyze and quantify the pharmacy's ability to pay long-term debt obligations, and continue to perform well. There are Debt equity and Debt ratios. Profitability ratios, relates to the

pharmacy's ability to generate profits through the efficient use of its assets providing a return to shareholders on their invested capital. The profitability ratios for analyzing Include: Return on assets (ROA), Return on equity (ROE) and Earnings per share on common stock. Return on assets measure the general profitability of assets and return on equity use for the measurement of the earnings on the shareholder's investment. The gross profit margin ratio is used as an indicator of a pharmacy's financial health and is expressed as a percentage. The higher the percentage is the more money is left for other operating expenses and net income. Another important financial indicator is Working Capital. It ensures that a pharmacy has enough cash to pay debts and expenses as they fall due, particularly during start-up periods. The working capital cycle is made up of four focal components. The key factor of successful cash management is to control each step in this cycle.[18-20]

We categorized pharmacy economic indicators further into 1) cost management, 2) efficiency and 3) profit/income categories. When we analyze a pharmacy, the first thing that reaches to our mind is prescription dispensing. Therefore, ratio analysis can be suitable and provides essential information for the pharmacy managers to develop appropriate staffing requirements and provide quality patient care. Two frequent indicators in this category include: Prescription sales per store open hour (Indicator of prescription activity and determining each operation hour of the pharmacy) and Prescriptions filled by a pharmacist per hour (Indicator of the efficiency for one pharmacist per day). Many ratios are used for effective management of payroll in relation to the prescription such as, FTE per Prescriptions dispensed (Indicator of FTE staffing levels relative to prescription dispensing volume) and FTE per patient day (Indicator of staffing levels relative to total number of patients in the hospital).[21-23]

In a study conducted in university of Lowa, pharmacy costs were classified into seven groups: production, supplies, employment, sales, overhead, gear, and miscellaneous (2). In another study on hospital pharmacy practice, the most important expenditure that required monitoring in a pharmacy was drug cost allocating to itself 70% to 75% of the pharmacy's budget. Other important expenditures include personnel and supplies. As a result, the major financial focus is the pharmacy's director who must be controlling the department's drug and personnel expenses.[24] In economic evaluation of clinical pharmacy services using cost analysis and outcome most studies showed positive financial benefits of the evaluated pharmacy service.[25] One important indicator is to break the equal analysis, which is the point at which income and expenses are exactly equal. This point is in its lower bound when it is defining profit margins and can be calculated for any period of time.[26] In the study of the University of Alabama, the pharmacy was divided into the prescription department and the front end enabling us to put the indicators in two scopes. The front end refers to all non-prescription item sales.[27] The pharmacy should have an adequate efficiency for better service delivery and use of resource. More studies were mentioned in this issue as important key indicators for assessing economic performance of the pharmacy.[28] In the performance evaluation and ratio analysis, different financial ratios were used, such as liquidity ratios, debt ratios, asset management and etc. Results showed that, the ratio analysis was the most important factor for performance assessment.[29,30] Gross margin return on investment (GMROI) is the other important ratio for pharmacy performance. It analyzes the pharmacy's ability to turn inventory into cash beyond the cost of inventory. The higher the ratio the better the result will be.[31] In the studies of Alabama Community Pharmacies, results showed that the managers should monitor prescription department inventory cost and target gross margin, as GMROI.[32] Our study results showed that the inventory management of pharmacies is an important basis for a better performance. Lacking technology to support automate, enough and on time purchasing caused the increasing of cost and investment and subsequently decreased the quality of care.[33]

A strong point of our study was that there wasn't any study available determining the economic and financial indicators to evaluate the pharmacy performance until the recent years. This study makes a basis for future research that takes advantage of these indicators in focus group discussion (FGD) and Delphi technique and formulates these indicators to assess the financial and economic performance of the pharmacy. Despite the considerable degree of heterogeneity in financial and economic indicators, there was scientific evidence of associations between pharmacy performance and financial and economic management. The authors searched the articles in Farsi data base; but due to lack of appropriate literature consist with the search strategies, the search was restricted to English articles. Unavailability of some valid databases, Lack of studies concerning financial indicators in a pharmacy and inaccessibility of electronic files for earlier papers (1970-1990) are the main shortcomings of the present study. Unpublished grey literature, publication in non-electronic journals and articles in other languages could lead to our publication bias.

Conclusion

It seems that the economic and financial evaluation of a pharmacy performance is essential. All the owners of the pharmacies in all countries need these indicators to evaluate their financial performance. It would be helpful to access such references, which have been derived from the literatures of the other countries to get more familiar with the indicators. The financial and economic indicators which had been summarized and sorted in our study, can be applied by any country for codifying their local indicators.

Acknowledgments

Conflict of Interest

The authors report no conflicts of interest.

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Reference	Number of used indicators & Example	Results
Robert J, et al:2006 Pittsburgh	8 Drug budget, Accounts receivable turnover	Director of pharmacy must use an approach to budgetary management
Lee C. Vermeulen, et al:2007 USA	6 Total Asset Turnover, FTE per investment	Identified seven dimensions of high-performance pharmacy (HPP) framework
Malovecká, I, et al:2013, Bratislava	18 Average collection period, Gross profit, Current ratio	Understanding and analysis of the financial statements in the pharmacy
Bruce A. Berger, et al:1986 Albama	11 total cost of a prescription, average prescription charge	Use the cost accounting principles showed that profitability in this study could be attributed primarily to the prescription department
William R. Doucette, et al:2011 USA	5 Total revenue for each service, FTE per Prescriptions dispensed	Examined to determine the total revenue and costs of each service and 7 of 11 pharmacy services showed a net profit each year
Mehdi Mohammadzadeh, et al:2013 Iran	3 Qtubin(rate of market value to net asset value), Return on equity (ROE)	Alignment between Marketing strategy and Financial strategy had significant impact on profitability
Miwako Kamei, et al:2000 Japan	4 OTC cost allocation, Workload	Evaluation functions were analyzed and classified into seven dimensions
Steve S. Rough, et al:2010 USA	10 Revenue adjustment, cost efficiency, Drug cost per patient day	Preferred productivity and cost metrics for measuring pharmacy department effectiveness
www.highperformancepharmacy. com USA	6 Budgeting of pharmacy, Employee turnover	Ranked hospital pharmacies and scores them on 78 practice elements in 8 dimensions
A.M. Sabzghabaee, et al:2008 Iran	8 Total income/ Functional costs ratio, Net	pharmacies financial documents and reports, used as a base for calculating the total income and the total costs

	Functional income/cost ratio	
David H. Kreling, et al:2004 **USA**	6 Hours of operation and Staffing ratio, Prescriptions dispensed per day	Dispensing and patient care activities, have increased productivity, quality of care and financial performance
Jerome Ng, et al:2010 **New Zealand**	2 Clinical pharmacy interventions, Prescribing errors	The top ranked KPIs reflected the pharmacist's central role in improving the individual patient's medicines use
KhosroKeshavarz, et al:2012 **Iran**	13 average net income gained from selling prescription medicines, percentage of expired drugs in pharmacies	Analysis indicated that the average annual costs (and expenses), income and profits of pharmacies have significant effects on a pharmacy's economy
Keith NHerist, et al:2011 **USA**	50 Cash ratio, Interest coverage ratio, Dividend yield, Reorder point (RP)	Provided evidence of the relevance of accounting and financial management in many areas of pharmacy practice
Zgarrick, David Paul:1993 **USA**	18 Size of Total Assets, Net Profit Percentage (NPP), Total Sales to Inventory	operational and environmental factors were Influenced in financial performance of pharmacy

Appendix 2. financial and economic indicators[a]

Financial indicators				Economic indicators					
Input indicators		Output indicators		Input indicators		Process indicators		Output indicators	
Description	Formula	Description	Formula	Description	Formula	Description	Formula	Description	Formula
Cash ratio	(cash + cash equivalents + investments) ÷ current liabilities	**Rate earned on total shareholders' equity**	Net income ÷ average shareholders' equity	**FTE per occupied bed**	Number of FTEs ÷ number of occupied bed	**Percentage of new Prescriptions**	Number of new Prescriptions ÷ total Prescriptions dispensed	**Total profit**	Net income × sales ratio
Size of Total Assets	Total assets a pharmacy has at the end of a given fiscal year	**Rate earned on common shareholders' equity**	(net income − preferred dividends) ÷ average common shareholders' equity	**TIC**	Purchase cost + order cost + carrying cost Or [(cost per unit × annual utilization)+ (annual utilization/EOQ) + (EOQ/2)]	**Technician order entry**	Number of new Prescriptions entered by technician ÷ total number of new Prescriptions	**ASP**	Total revenue from a products sale ÷ total number of unit sold
Debt-equity ratio	Total liabilities ÷ total stockholders' equity	**Earnings per share on common stock**	(net income − preferred dividends) ÷ shares of common stock outstanding	**RP**	Lead time × average usage per unit of time (lead time from placing to receiving an order)	**Total payroll per Prescriptions dispensed**	Total payroll ÷ number of Prescriptions dispensed	**Revenue adjustment**	total inpatient and clinic pharmacy charges ÷ total inpatient pharmacy charges
		Dividends per share of common stock	Dividends ÷ share of common stock outstanding	**Space ratio**	Total department area ÷ total facility area	**Average COD**	Total COD ÷ number of prescriptions	**Total revenue for each service**	service frequency × number of patients
		Dividend yield	Dividends per share of common stock ÷ market price per share of	**Drug cost per patient day**	Drug cost ÷ number of patients in hospital per day	**average prescription charge**	Total prescription department sales ÷ total number of prescriptions	**Functional income/cost ratio**	Functional income ÷Functional costs

			common stock				filled		
		Total sales to accounts receivable	total sales ÷ accounts receivable	**Qtubin (rate of market value to net asset value)**	Equity Market Value + Liabilities Market Value) ÷ (Equity Book Value + Liabilities Book Value	**Prescription sales per store hour open**	Total Prescriptions dispensed ÷ total store hours of operations	**Non-functional income/ Non-functional costs ratio**	Non-functional income ÷ Non-functional costs
		Working capital as a percentage of sales	[(inventory + accounts receivable – accounts payables) ÷sales] × 100	**Drug cost**	Drug cost ÷ number of hospital admission or discharge	**Clinical pharmacy interventions**	Identification and resolution of potential or actual drug related problems per patient bed day	**Total income/ Total costs ratio**	Total income ÷ Total costs
		Gross profit margin ratio	Gross profit ÷ sales	**average manpower expense**	manpower expense ÷ number of manpower			**Total income/ Functional costs ratio**	Total income ÷ Functional costs
				Variable costs allocation to COD	Total variable costs × sales ratio			**Net income ratio**	Net income ÷ net sales
				Fixed costs allocation to COD	Total fixed costs × space ratio			**Pharmacy profitability**	prescription department + front-end merchandise
				FTE per patient day	Number of FTEs ÷ number of patients in hospital per day			**Net profit margin ratio**	Net profit ÷ Net sales
								average net income gained	net income gained from selling

								from selling OTC drugs	OTC ÷ total number of OTC
								average net income gained from selling hygienic & cosmetic products	net income gained from selling hygienic & cosmetic products ÷ total number of hygienic & cosmetic products

Abbreviations: FTE, Full-time employee; TIC, Total inventory cost; RP, Reorder point; COD, cost of dispensing; ASP, Average sale price; OTC, Over-the-counter.