FACTORS ASSOCIATED WITH HOSPITAL PROFITABILITY: A SYSTEMATIC REVIEW

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ABSTRACT

Maximizing profitability is a goal that is often a challenge as healthcare providers work to balance the cost of providing effective, timely care and innovative services. This research aims to review the evidence that identifies the factors that can affect hospital profitability using a systematic review study. Articles published in the last 10 years in Proquest, Google Scholar, and EBSCO databases were systematically reviewed. Thirteen articles that met the inclusion and exclusion criteria were selected for further review. Findings regarding factors that can affect hospital profitability were systematically synthesized. Thirteen articles explore This paper attempts to summarize the hospital profitability model by establishing relationships between the seventeen factors divided into six key subheadings identified such as organizational factors, managerial factors, patient mix factors, market conditions, health system and technology services. An examination of the factors was associated with hospital profitability and their impact on profitability can improve our understanding of the hospital industry. Further examination of the varying relationship between hospital operating factors and their profitability by hospital ownership type reveals that nonprofit hospitals behave very differently.

Keywords: Hospital, Profitability, Systematic Review.

BACKGROUND

Financial stability is paramount to the continued growth and development of hospitals (Chun and Cho 1993). Marginal profit measures are derived for the two payment classes, cost payers and charge payers that the hospital industry must consider in profitability analysis, i.e., predicting the excess of revenues over expenses (Cleverley 1978). Hospitals couldn't do much about revenue trends in FY20, as growth slowed to 3% from 5.9% the year before. The suspension of elective procedures and the slow pace of patient volume recovery were key factors (Hut 2021). It is likely that the COVID-19 pandemic has had a significant negative impact on hospital profitability. Financial difficulties may hinder hospitals' efforts to acquire new technologies (Huang 2016), attract well-trained and talented healthcare professionals, and make structural changes necessary to provide patient care in today's value-based purchasing environment (Bazzoli, Fareed, and Waters 2014).

Profit is the difference between revenues and expenses.

Increasing an organization's profitability can be done by increasing revenues, reducing expenses, or a combination of both. Increased profitability is the result of, among other things, organizations efficiently changing their inputs (resources) to increase their outputs (Baik et al. 2013). Whether a service will be profitable for a hospital depends on many circumstances, such as the patient population most likely to receive the service, market conditions, insurance company and government policies at the time the service is adopted and provided, the priorities and management skills of hospital executives, and a number of other factors (Bai and Anderson 2016). If the determinants of hospital profitability can be identified, hospital executives can focus their efforts on those aspects of operations that most influence profitability, and public policy makers can gain insight into the potential impact of alternative policy decisions on hospital financial viability (Gapenski, Vogel, and Langland-Orban 1993).

Previous studies have examined the financial performance of hospitals. However, the results are not consistent and coherent. One factor that complicates the analysis and comparison of financial performance across studies is the lack of standardization of financial performance measures. A study of the relationship between efficiency and hospital profits found that the pursuit of efficiency has become a primary goal of policy makers in most health care systems (Jacobs, Smith, and Street 2006). Mutter showed that although costs can be reduced in socially undesirable ways, such as by reducing the quality or quantity of services (which reduces access), increasing efficiency can increase the quality or quantity of services for the same expenditure (Mutter, Rosko, and Wong 2008). Working capital management is indeed important to hospital profitability. Efforts to reduce large balances in both accounts receivable and accounts payable can often be worthwhile investments that have the potential to reduce the costs associated with working capital management and thus improve an organization's profitability (Rauscher and Wheeler 2012). Gapenski examined a number of determinants of hospital profitability, including teaching status, hospital size, ownership status, system affiliation status, age of the facility, case mix, average length of stay, and others. They categorized the determinants as organization, management, patient mix, and market variables (Gapenski et al., 1993).

However, there has been limited analysis of the hospital profitability. Hospitals must adapt to a new landscape of technologies, regulations, and reimbursement models to serve patients and meet business goals. Maximizing profitability is a goal that is often a challenge as healthcare providers work to balance the cost of providing effective, timely care and innovative services. Many studies have been conducted to examine hospital cost structures and certain financial performance factors. This article aims to review the evidence that identifies the factors that can affect hospital profitability using systematic review studies.

LITERATURE REVIEW

A review of the economic literature reveals that there are two theories that provide alternative explanations for the factors that influence a firm's profitability. On the one hand, the first theory

suggests that firm profitability depends on the structural characteristics of the industry or sector in which the firm operates (Scherer and Ross 1990). On the other hand, the second theory presupposes that profitability is determined by the capabilities and equity of each firm (Barney 1991). Hospital financial analysis relies primarily on financial accounting information (Watkins 2000), but Cleverly asserts that non-financial information, along with financial ratios, provides more value in diagnosing the health of hospital enterprises (Cleverley 1990).

RESEARCH METHODS

This research uses a systematic review study which was carried out by searching for articles on Proquest, Google Scholar and EBSCO. Search keywords using Boolean Operators include OR/AND/NOT. The literature search terms used were "hospital(s)" AND "profitability" OR "hospital(s)" AND "profit". The selection of library source articles was carried out by assessing the quality and results of studies discussing the determining factors of patient loyalty. Inclusion criteria are original studies conducted as empirical research, articles published in the last ten years 2014-2024, research published in English, full text and free access. Literature review articles, systematic reviews and meta-analyses were excluded from this study.

Quality Appraisal

The CASP Critical Appraisal of Study Quality tool is used to critically appraise studies, including the validity of the research, the accuracy of the research findings, and the usefulness of the research for practice. The quality assessment tool uses a series of questions according to the research design to assess whether the study can be used as high-quality evidence.

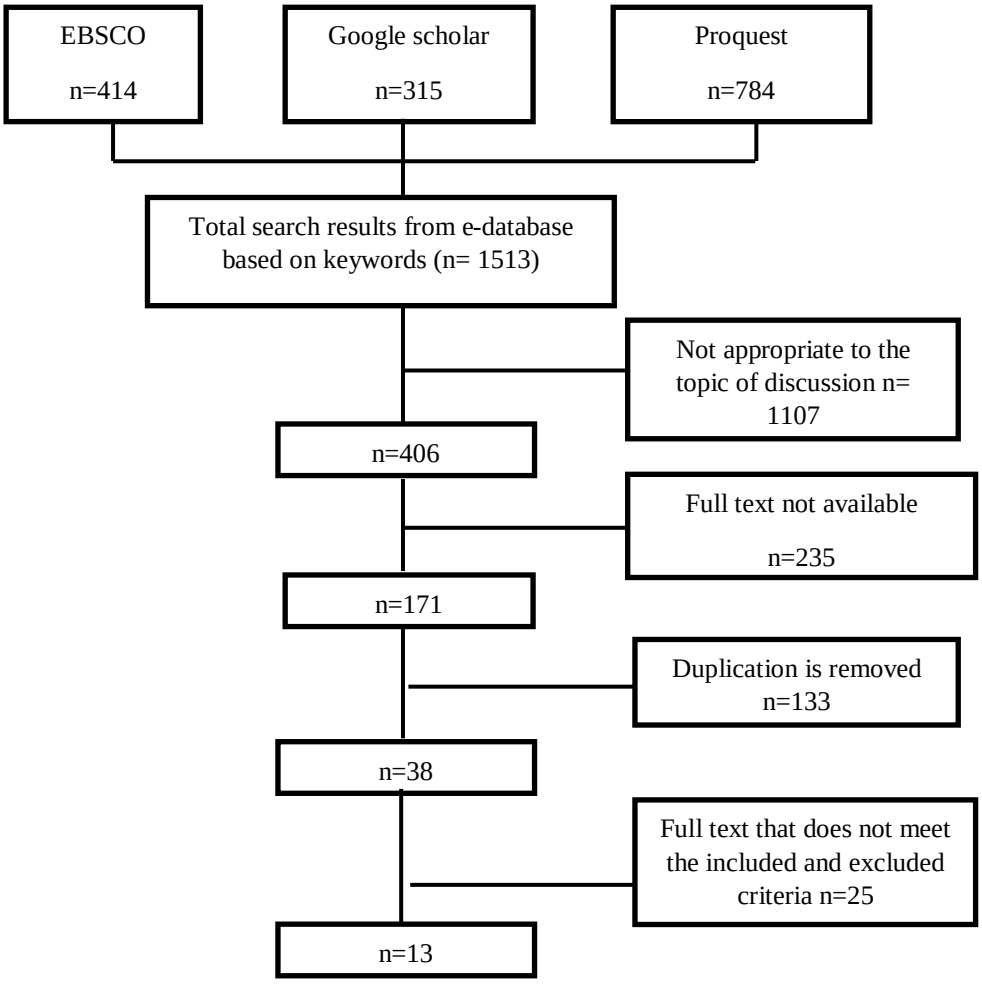

Figure 1. Flow Chart Of Articles Included In The Study

Data abstraction and synthesis

For each article, we extracted author(s) information, title, year of publication, data source/sample, and findings/ conclusions (Table 1). After carrying out the screening process, the final results were 13 articles.

Table 1. Data abstraction

No	Title, Author, year	Sample/ Data source study	Results
1.	**A More Detailed Understanding Of Factors Associated With Hospital Profitability** (Bai and Anderson 2016)	3,255 acute care hospitals with fiscal years beginning 2012 to 2013/Centers for Medicare and Medicaid Services	Having more uninsured patients in the county where a hospital is located was associated with lower hospital profitability
2.	A Kitchen with too Many Cooks: Factors	55,163 hospital-year observations from 1997 to	The ownership type should determine the factors on hospital profitability which hospitals focus

No	Title, Author, year	Sample/ Data source study	Results
	Associated with Hospital Profitability (Na-Eun and Hong 2018)	2010/Center for Medicare and Medicaid Services CMS	and hence are useful to hospital management.
3.	Does Patient Safety Pay? Evaluating the Association Between Surgical Care Improvement Project Performance and Hospital Profitability (Beauvais et al. 2019)	6,400 hospitals / The American Hospital Association (AHA) Annual Survey Database .	a. Two dimensions of organizational profitability: operating margin and net patient revenue. b. Improved hospital safety performance is associated with a relative risk of higher operating margin and net patient revenue, with some variation noted among the measures of patient safety. c. Improvement in patient safety performance is associated with improved financial performance at the hospital level. d. Increased attention to safe care delivery may allow hospitals to generate additional patent care earnings, improve margins, and create capital to advance hospital financial position.
4	An Exploratory Analysis of the Association between Hospital Quality Measures and Financial Performance (Beauvais, Dolezel, and Ramamonjiarivelo 2023)	2127 hospital observations for the year 2022/ Definitive Healthcare .	a. Significant findings were reported for seven of eight quality measures tested, including the HCAHPS Summary Star Rating, Hospital Compare Overall Rating, All-Cause Hospital-Wide Readmission Rate, Total Performance Score, Safety Domain Score, Person and Community Engagement Domain Score, and the Efficiency and Cost Reduction Score b. Failing to address quality and patient safety issues is costly for US hospitals. c. Increased attention to the quality of care delivered as well as patients' perceptions of care may

No	Title, Author, year	Sample/ Data source study	Results
			allow hospitals to accentuate profitability and advance a hospital's financial position.
5	Health systems: changes in hospital efficiency and profitability (Büchner, Hinz, and Schreyögg 2016)	2,045 of all German hospitals from 2000 to 2011/ Research Data Center of the Federal Statistical Office of Germany	a. The health system entry increases hospital technical and cost efficiency by between 0.6 and 3.4 % in four alternative post-entry periods, indicating that health system entry has not a transitory but rather a permanent effect on hospital efficiency. b. Regarding hospital profitability, the results reveal an increase in hospital profitability only 1 year after health system entry, and the estimations suggest that this effect is a transitional phenomenon. c. Overall, health system entry may serve as an appropriate management instrument for decision makers to increase hospital performance.
6	Patient experience and hospital profitability: Is there a link? (Richter and Muhlestein 2017)	3767 hospitals over the 6-year period 2007–2012/ Centers for Medicare & Medicaid Services and Hospital Consumer Assessment of Healthcare Providers and Systems	a positive patient experience is associated with increased profitability and a negative patient experience is even more strongly associated with decreased profitability
7	Revisiting 'The Determinants of Hospital Profitability' in Florida (Nevola 2016)	Florida Uniform Hospital Reporting System for years 2010-2014	a. Hospital markup of charges, and the average age of a hospital's equipment and facilities – negative and positive effects, respectively - with profitability. b. The negative association of debt utilization and bad

No	Title, Author, year	Sample/ Data source study	Results
			debt expenses with profitability c. The positive association of labor yield and county-level hospital concentration. d. Bed size and system affiliation were also negatively associated with profits. e. The remaining characteristics, including the two quality measures (a Hospital Consumer Assessment of Healthcare Providers and Systems patient experience score and the hospital's Magnet Recognition designation), were not significantly associated with profitability.
8	Predictors of Hospital Profitability: A Panel Study Including the Early Years of the ACA (Rosko et al. 2018)	1,908 metropolitan U.S. hospitals in 2000-2015/ Medicare Hospital Cost Reports and the American Hospital Association Annual Survey of Hospitals.	Competitive advantages such as size, market power and availability of high-technology services are associated with higher hospital profitability.
9	Efficiency and profitability in US not-for-profit hospitals (Rosko, Al-Amin, and Tavakoli 2020)	1317 not-for-profit (NFP) hospitals in 2015/ Medicare Hospital Cost Reports	a. More efficient hospitals were also more profitable. b. The positive relationship between profitability and size, concentration of output, occupancy rate and membership in a multi-hospital system. c. An inverse relationship was found between profits and academic medical centers, average length of stay, location in a Medicaid expansion state, Medicaid and Medicare share of admissions, and unemployment rate.

No	Title, Author, year	Sample/ Data source study	Results
			d. The results of a Hausman test indicates that efficiency is exogenous in the profit equations. e. The findings suggest that not-for-profit hospitals will be responsive to incentives for increasing efficiency and use market power to increase surplus to pursue their objectives.
10	Influential variables in the profitability of hospital companies (Creixans and Arimany-Serrat 2018)	80 hospitals in 2008-2015 /SABI database and information in the Companies Registry	The economic and financial health of hospital companies is characterized by acceptable liquidity and indebtedness that significantly influence its profitability; this is accompanied by good financial and expenditure management, though it is necessary to improve the management of assets.
11	The association of hospital profitability and digital maturity – An explorative study using data from the German DigitalRadar project (Vogel et al. 2024)	860 hospitals/ DigitalRadar (DR) project (2021) and financial statement data from the Hospital Rating Report from 2017 to 2019	a. Higher profitability is associated with higher digital maturity. b. Hospital's large chain membership is strongly associated with higher digital maturity c. For larger chains, profitability is more strongly associated with digital maturity. d. Larger chains have IT-strategies, and might benefit from central structures and cross-financing
12	Do Chargemaster Prices Matter?: An Examination of Acute Care Hospital Profitability. (Linde and Egede 2022)	1996 US acute care hospitals through 2017/ Medicare cost report data	Higher chargemaster markups are associated with higher hospital profitability.
13	A Decomposition of Hospital Profitability: An Application of DuPont Analysis to the US Market (Turner et al. 2015)	3,255 U.S. hospitals between 2007 and 2012 / The Centers for Medicare & Medicaid Services'	a. The investor-owned hospitals have higher profit margins, higher efficiency, and are substantially more leveraged.

No	Title, Author, year	Sample/ Data source study	Results
		Healthcare Cost Report Information System (CMS Form 2552)	b. Hospitals in systems are found to have higher ROE, margins, and efficiency but are associated with less leverage. c. A number of important and significant interactions between teaching status, ownership, location, critical access designation, and inclusion in a system are documented.

RESEARCH RESULT

The studies explored a renewed approach was used to carry out this review, that is, the topic was divided under six subheadings and relevant literature was studied and commented on.

Organizational Factors

The type of hospital ownership should determine the factors on which hospitals focus, including hospital profitability. Distinct objective functions for three types of hospitals: for-profit hospitals are driven by the overarching, agreed-upon goal of maximizing profits for shareholders; government hospitals, which are often insurers of last resort, are obligated to put the public interest ahead of profit goals; nonprofit hospitals, which are legally prohibited from distributing profits, occupy the middle ground between for-profit and government hospitals. This implies that the efforts of hospital administrators to increase profitability should be guided by the type of ownership for certain aspects of operations (Na-Eun and Hong 2018). Profitability was negatively associated with government ownership of hospital. A positive relationship was found between profitability and membership in a multi-hospital system. An inverse relationship was found between profits and academic medical centers (Rosko, Al-Amin, and Tavakoli 2020).

Investor-owned hospitals have higher profit margins, higher efficiency, and are substantially more leveraged (Turner et al. 2015). System affiliation were also negatively associated with profits (Nevola 2016). System affiliation, particularly membership in larger systems, may lead to increased profitability through either improved bargaining power in reimbursement rate negotiations or economies of scale (Bai and Anderson 2016).

Managerial factors

The economic and financial health of hospital companies is characterized by acceptable liquidity and indebtedness that significantly influence its profitability; this is accompanied by good financial, expenditure management and improve the management of assets (Creixans and Arimany-Serrat 2018). The negative association of debt utilization and bad debt expense with profitability, and the positive association of labor yield and county-level hospital concentration (Nevola 2016). Two dimensions of organizational

profitability were operating margin and net patient revenue. Our results indicate that improved hospital safety performance is associated with a relative risk of higher operating margin and net patient revenue, with some variation among patient safety measures.

Improved patient safety performance is associated with improved financial performance at the hospital level. Increased attention to safe care delivery may allow hospitals to generate additional patent care revenue, improve margins, and generate capital to improve the hospital's financial position (Beauvais et al. 2019). Hospital charge mark-ups and the average age of a hospital's equipment and facilities have a negative or positive impact on profitability (Nevola 2016), higher chargemaster markups are associated with higher hospital profitability (Linde and Egede 2022). The efficiency is exogenous in the profit equations, the findings suggest that not-for-profit hospitals will be responsive to incentives for increasing efficiency and use market power to increase surplus to pursue their objectives (Rosko, Al-Amin, and Tavakoli 2020).

Patient mix factors

Increased attention to the quality of care provided, as well as to patients' perceptions of care (Beauvais, Dolezel, and Ramamonjiarivelo 2023) and patient safety performance (Beauvais et al. 2019), can enable hospitals to emphasize profitability and improve a hospital's financial position. Positive patient experience is associated with increased profitability and negative patient experience is even more associated with decreased profitability (Richter and Muhlestein 2017). A positive relationship was found between profitability and occupancy rate. An inverse relationship was found between profits and average length of stay, Medicaid and Medicare share of admissions (Rosko, Al-Amin, and Tavakoli 2020).

Market conditions

Having more uninsured patients in the county where a hospital is located was associated with lower hospital profitability (Bai and Anderson 2016). Competitive advantages such as size and market power are associated with higher levels of hospital profitability (Rosko et al. 2018). A positive relationship was found between profitability with size and production concentration. An inverse relationship was found between profitability and location in a Medicaid expansion state and unemployment rate (Rosko, Al-Amin, and Tavakoli 2020).

Health System

Health system entry increases hospital technical and cost efficiency by 0.6% to 3.4% in four alternative post-entry periods, indicating that health system entry has a permanent rather than a temporary effect on hospital efficiency. Regarding hospital profitability, the results show an increase in hospital profitability only one year after health system entry, and the estimates suggest that this effect is a transitory phenomenon. Overall, health system entry can serve as an appropriate management tool for decision makers to improve hospital performance (Rosko, Al-Amin, and Tavakoli 2020)

Technology Services

The availability of high-technology services are associated with higher levels of hospital profitability (Rosko et al. 2018). Higher profitability is associated with higher digital maturity.

Hospitals' membership in large chains is strongly associated with higher digital maturity. For larger chains, profitability is more closely related to digital maturity. Larger chains have IT strategies and may benefit from centralized structures and cross-funding (Vogel et al. 2024). Health information technology spending has impact on hospital financial performance and productivity.

Hospital Profitability**: An Integrated Conceptual Model**

The literature explores several determinants of patient loyalty within a single framework. Therefore, an integrated conceptual model consisting of all the suggested determinants is proposed (Figure 2). This paper attempts to summarize the hospital profitability model by establishing relationships between the seventeen factors divided into six key subheadings identified. The conceptual model shows the influence of the four previous factors related to profitability that have been identified such as organizational factors, managerial factors, patient mix factors and market conditions. The additional factors are technology services and insurer and government policies.

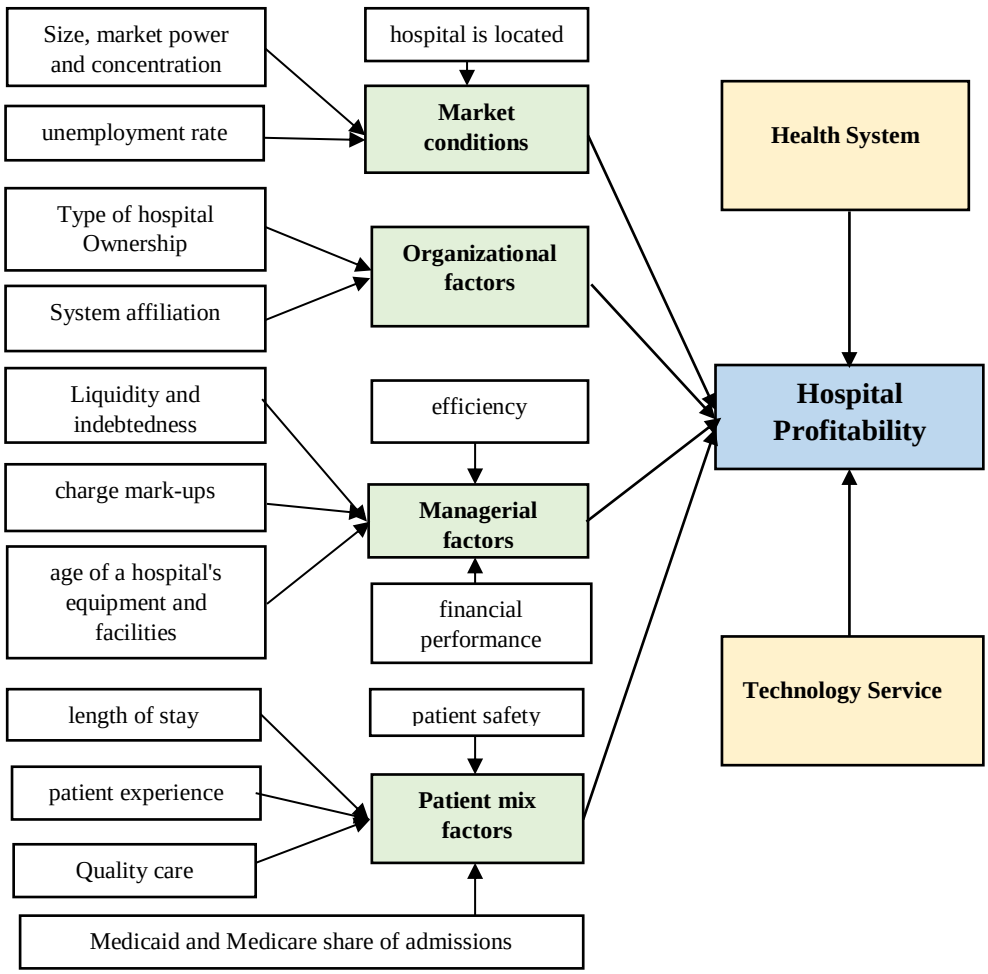

Figure 2. The conceptual model of hospital profitability

The organizational factors was found relationship with profitability included type of hospital ownership and system affiliation of hospital. Managerial factors namely liquidity and indebtedness, chargemark-up, age of a hospital's equipment and facilities, financial performance and efficiency that significantly influence its profitability. Patient experience, quality care, patient safety, average length of stay, Medicaid and Medicare share of admissions are patient mix factors related to hospital profitability. Market conditions i.e., hospital located, unemployment rate, and competitive advantages (such as size, market power and concentration) were associated with hospital profitability. The availability of high-technology services was associated with higher levels of hospital profitability. Regarding hospital profitability, the results show an increase in hospital profitability only one year after health system entry (insurer and government policies)

CONCLUSION

An examination of the factors was associated with hospital profitability and their impact on profitability can improve our understanding of the hospital industry. Further examination of the varying relationship between hospital operating factors and their profitability by hospital ownership type reveals that nonprofit hospitals behave very differently.

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