Development of Financial Indicators of Hospital Performance

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Abstract

**Purpose:** To develop an appropriate set of financial performance indicators for use in Iranian hospitals.

**Methods:** This study consists of three steps. At the first step, using a literature review and three focus group discussions, the financial indicators that had been deemed to be important measures of hospital financial performance were identified. As the second step, a multidisciplinary panel of experts rated the indicators via two-round Delphi technique. Through the third step, the panel assessed the indicators at one consensus meeting.

**Results:** Among 102 indicators identified at the first step, 79 indicators were selected in the Delphi technique. In the panel consensus meeting, the positive consensus was achieved on the 34 indicators. Upon the experts' opinion, eight indicators were added after few modifications and 13 new indicators were developed. Finally, 55 indicators were selected as financial indicators for assessing the hospital performance.

**Conclusion:** This study developed a set of financial indicators for Iranian hospitals, that helps hospital managers to identify hospital financial trends over a period of time and compare their performance with peer hospitals. The information derived from these indicators, may guide plans and decisions to improve hospital financial performance.

Introduction

Today’s healthcare providers face a complex environment that is changing rapidly. The rapid growth and change in technology, the aging population, increasing of chronic diseases and finally the rising healthcare costs causes serious financial challenges for healthcare providers. In order to deal with these challenges, healthcare organizations require sound financial management practices specifically monitoring their financial performance to be proactively able to overcome the financial distresses and efficiently and effectively achieve their goals [1-5].

On the other hand, patient’s belief about the service quality is positively associated with hospital’s financial performance [6]. The literature, acknowledge that even if non-profit hospitals’ objective is not the earning profit, they should consider financial variables as essential elements to accomplish their missions [5, 6].

Hospital managers need the valid financial measures to determine their current financial condition and plan to improve their performance [5]. Also, the recent trend toward using financial indicators for hospital executives evaluating is noteworthy [6]. Thus, using financial indicators for assessing hospitals’ performance has become popular [5, 7, 8].
Since the 1980s, hospitals’ financial performance analysis started to grow and the specific financial ratios that reflecting this industry’s unique characteristics, were designed and employed [9]. Collecting and employing of financial indicators not only acts as a hospital internal management tool, but also provides information for external beneficiaries and for bargaining more funding. In addition, it enables hospitals to identify their financial trends over a period of time and make comparisons with peer hospitals. Thus, they can recognize their strengths and weaknesses [5, 10, 11].

To date some studies have been published that focused on identifying, designing and using of financial indicators for hospitals with respect to their unique and defined characteristics. This is the inevitable due to differences between hospitals in missions, goals, financing methods, the population needs, the payment systems, and ownership status and so on [6,12-16].

The purpose of this study was to use available literature and expert consensus to develop a set of financial indicators for Iranian hospitals.

**Methods**

The approach used to select the hospital financial indicators is depicted in **Figure 1**.

**Step 1: Literature review and focus group discussions**

A comprehensive literature review was undertaken to identify the financial indicators that had been deemed to be important measures of hospital financial performance. PubMed, Web of Knowledge, Science Direct, SID and Magiran were searched. Some of Iranian unpublished studies were also reviewed. Articles published prior to 2000 were excluded from the searches. In total, 102 indicators were identified by literature review. [See References 1, 3-5, 7-9, and 12-37 for articles and publications used].

In this step, three focus group discussions with participating of professors of health services management, professors of health economics, hospital managers, and experts in budgeting and financial management of Tabriz University of Medical Sciences were established. In these sessions, 10 financial indicators was introduced which were similar to the extracted indicators from literature review. Focus group discussion is a qualitative research methodology in which a small group of participants convene to discuss on a specific subject. The main feature of focus groups is the interplay between group members, as well as the interplay between them and the moderator. Its main purpose is to provide information about knowledge, attitudes and perspectives that individuals have about certain topics. Focus group discussion popularity is rising in medical and health researches [38,39].

**Step 2: Delphi technique**

The Delphi technique is a structured process to collect and summarize knowledge from a panel of experts which is done by questionnaire [40]. Expert is a person that is knowledgeable about a specific subject [41, 42]. Selecting different groups of experts assures a wide range of opinions [42, 43]. The first non-military application of Delphi technique was suggested in planning developing economies [44, 45]. In this study, we used two-round Delphi technique to collect experts’ opinions on the indicators using two criteria: importance (whether the indicator is considered as an important measure of the hospital financial management) and feasibility (whether the indicator can be accurately calculated using hospitals’ financial documents). The panel size was 25 including professors of health services management, professors of health economics, hospital managers and experts in budgeting and financial management of Tabriz University of Medical Sciences. In the first round, the expert panel was provided with a package that included the research purpose and method and a tabulated list of indicators, their definition and formula. In this package, indicators were categorized in 7 performance dimensions. The panel members were asked to rate indicators in terms of importance and feasibility on a 9-point scale. For each indicator, the experts’ rating was summarized into a median rating. In round 1, indicators with the median score less than 4 were excluded, score >4 and <7 were selected to the second round of Delphi and indicators with score of >7 were accepted as the final indicators.

In round 2, 83 indicators were rated by panel’s members and indicators with score >7 were selected on the Friedman’s rating test.

**Step 3: Panel consensus meeting**

One panel consensus meeting was established to review and finalize the selected indicators in Delphi technique.
Figure 1. Approach for selecting hospital financial indicators.

Results

In total, 102 hospital financial indicators were identified from literature review and focus group discussions and distributed across 7 performance dimensions: 11 indicators were assigned to the domain of “profitability”, 6 to the “liquidity”, 21 to the “revenue”, 25 to the “cost”, 11 to the “capital structure”, 14 to the “asset efficiency” and 14 to the “human resources”.

In the first round of the Delphi technique, 100% of the questionnaires were returned from the participants. For each indicator, median score was calculated. 19 indicators gained a median score > 7 in both of criteria.

Table 1. The list of final accepted hospital financial indicators.

<table>
<thead>
<tr>
<th>Row</th>
<th>performance dimension</th>
<th>indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Profitability</td>
<td>Return on asset</td>
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<tr>
<td></td>
<td></td>
<td>Total margin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Operating margin</td>
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<tr>
<td>4</td>
<td>Liquidity</td>
<td>Current ratio</td>
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<tr>
<td></td>
<td></td>
<td>Quick ratio</td>
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<tr>
<td></td>
<td></td>
<td>Days cash on hand</td>
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<tr>
<td></td>
<td></td>
<td>Average payment period</td>
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<td>8</td>
<td>Capital structure</td>
<td>Capital expense</td>
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<tr>
<td></td>
<td></td>
<td>Debt ratio</td>
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<td></td>
<td></td>
<td>Debt service coverage</td>
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<td></td>
<td></td>
<td>Long term debt to capitalization</td>
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<td></td>
<td></td>
<td>Long term debt to total asset</td>
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<td></td>
<td></td>
<td>Cash flow to total debt</td>
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<td>Fixed asset financing</td>
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<td></td>
<td></td>
<td>Cash flow to assets</td>
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<td></td>
<td></td>
<td>New investments to total expenses</td>
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<tr>
<td>17</td>
<td>Revenue</td>
<td>Inpatient revenue percentage based on the hospital wards</td>
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<tr>
<td></td>
<td></td>
<td>Outpatient revenue percentage based on the hospital ambulatory units</td>
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<td></td>
<td></td>
<td>Drug revenue to total revenues</td>
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<td></td>
<td></td>
<td>Drug revenue to drug expense</td>
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<td></td>
<td>Growth rate in the dedicated revenue</td>
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<td></td>
<td>Dedicated revenues to total financial resources</td>
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<td></td>
<td></td>
<td>Non-operating revenue</td>
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<td></td>
<td>Rate of realization of hospital revenue</td>
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<td></td>
<td>Rate of received revenue from the insurers</td>
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<tr>
<td></td>
<td></td>
<td>Dedicated revenue to total expenses</td>
</tr>
<tr>
<td>27</td>
<td>Cost</td>
<td>Cost per hospitalization based on the hospital wards</td>
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<tr>
<td></td>
<td></td>
<td>Cost per outpatient visit based on the hospital ambulatory units</td>
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<td>Patient deductions</td>
</tr>
</tbody>
</table>
In round 2, 83 indicators were sent to the experts to rate. 22 experts returned questionnaires thus the response rate was 88%. In this round, 23 indicators were excluded. According to the two-round Delphi results, 79 indicators were retained and discussed in a panel consensus meeting to revise and finalize. In the panel consensus meeting, 8 indicators were revised based on the panel members’ opinions and 37 were omitted. Also, 13 indicators were developed upon the experts’ opinions. Finally 55 indicators were selected as financial indicators for assessing hospital performance (Table 1).

Discussion

The current study is aimed to develop a set of financial indicators for Iranian hospitals. Numerous studies demonstrate that various healthcare providers, have developed their own unique performance indicators and this is an uprising trend [7, 46, 47]. In one study to develop comparative financial indicators for “Critical Access Hospitals”, 114 indicators were identified using the literature review. Among them, the 37 frequently used indicators were selected. The research expert panel evaluated the indicators using 3 criteria: usefulness, importance and feasibility. Finally they selected 20 financial indicators and categorized them into 6 financial performance dimensions: profitability, liquidity, capital structure, revenue, cost and utilization [8].

In the research that was performed in Canada, the key financial indicators for “Acute Care Hospitals” were selected. The literature review, focus group discussions and panel consensus meeting was conducted and 9 indicators identified as the key indicators for Acute Care Hospitals. These measures were distributed over 5 financial performance domains [12]. Researchers in the another study, have introduced 15 financial measures as part of a “hospital dashboard” and suggested that analyzing these indicators in combination, is an effective tool for assessing a hospital’s financial performance [14].

A study on public hospitals was done in Turkey. The public hospitals are run by the Ministry of Health. The Ministry of Health is delivering the most primary and secondary health services in Turkey. Researchers achieved 5 key financial indicators for assessing and improving financial performance in Turkish public hospitals [16].

One study surveyed the healthcare executives to identify performance indicators which are necessary for organizational assessment and improvements. 6 indicators were selected as the most important for the healthcare decision-makers [7]. In the current study, 102 hospital financial indicators were identified from literature review and focus group discussions. Then, we used two-round Delphi technique to collect experts’ opinions on the indicators using two criteria: importance and feasibility. Finally in the panel consensus meeting, the retained indicator from Delphi study, were discussed to revise and finalize. Based on the panel members’ opinions, 55 indicators were selected as financial indicators for assessing hospital performance.

Some of the final accepted indicators had been deemed to be important measures of hospital financial performance in many studies. But in case of some of them, there is less evidence support. This is may be due to the differences between Iranian hospitals and other hospitals in the financing methods, accounting methods, the payment system and ownership status. In addition, this is important to consider that the literature alone cannot provide a sufficient basis to select key financial indicators.

Some of the selected indicators in this study, like “bed occupancy rate”, are not financial indicators by nature. However there is evidence that indicates some of non-financial measures like measures of efficiency, influence on hospital financial performance [9, 21, 48, 49]. So, the research experts consider them.

It is better to consider the relevant indicators in a financial performance dimension. This helps achieve an informed judgment about an organization’s financial health. For example, profitability indicators may show a hospital has a profit but liquidity indicators may indicate it is not able to pay its bills [8, 12]. For this reason, we categorize the indicators into 7 financial performance dimensions.

Among Iranian hospitals, there is variation in the volume and type of services provided, ownership, mission and financing method, therefore the expert panel attempted to develop and select the indicators that able to measure financial performance of this wide range of hospitals. The expert panel suggested that some indicators should be defined according to hospital type. For example, the phrase of “dedicated revenue” was replaced...
with the phrase of "total revenue" for nonpublic hospitals because "dedicated revenue" is specially used for the public hospitals. It is necessary to consider the differences to make judgment about hospitals’ financial performance because they influence on the indicators value.

Conclusion
The current study is an attempt to provide policy makers and hospital managers with a set of comparative financial indicators designed specifically for Iranian hospitals to improve their organization’s financial performance.

If hospitals be able to use the resources effectively, they can respond to the population needs. Hospitals and governments for reducing costs, increasing profit and continuing operations need to monitor financial performance and forecast financial problems. The reviewed literature shows that the financial indicators are effective means for monitoring financial conditions and for predicting financial distresses. Finally, it should be noticed that indicators help detect the problems but they will not necessarily show the solutions. Suggested indicators in this study should be evaluated through pilot studies to determine their effectiveness. The researcher intends to conduct a pilot study in teaching hospital in East Azerbaijan, Iran.

Conflict of interests: The authors declare no conflict of interest.

References