

# Designing a Public-Private Partnership Model for Public Hospitals in Iran

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## Abstract

**Background and Objectives:** Public-private partnership (PPP) is a well-established model to alleviate the risk of investment in health domain. While the model is widely applied in the developed countries, the adoption of the model in many developing countries is hampered partly by the lack of knowledge on dimensions and requirements of its local implementation. The present study, thus, aimed to identify the key aspects of PPP for hospital building in an Iranian context.

**Methods:** A comparative study of PPP implementation in seven pioneer countries revealed 53 elements potentially influencing development of PPP. Using rigorous expert opinion seeking, these elements were refined and adapted with respect to the Iranian context. Based on this information a 38-item questionnaire was designed. The questionnaire was distributed among 220 experts from different health domains, including clinicians of public and private hospitals and policy makers, executives, and authorized advisors from the Ministry of Health and Medical Education (MOHME) and various medical universities. The collected data were analyzed using exploratory factors analysis in order to identify factors influencing PPP development. The robustness of the identified factors was further explored by confirmatory factor analysis (CFA).

**Findings:** Legislation, policy making, finance, capacity building, and social orientation were identified as the five key dimensions of hospital-building PPP implementation in the Iranian context.

**Conclusions:** Identification of the major dimensions of hospital PPP implementation may help policy-makers to develop effective strategies for promotion of PPP in the Iranian health system.

**Keywords:** Public-private participation, Hospital management, Healthcare system

## Background and Objectives

In many developing countries, the public sector has the major responsibility to develop the health system infrastructure, where the private sector plays a minor role due to factors such as high costs, long-run return on investment, weak financial power, and the lack of supportive laws and regulations.<sup>1,2</sup> Factors such as advancement of medical sciences and technology, development of new therapies, lifestyle and socio-cultural changes, population growth, and the change in the nature of required health services, has imposed increasingly higher health expenditures to the health system of many countries, including Iran.<sup>3</sup> Recent statistics has indicated that the expenditure of Iranian government on health accounts for over 15 of

the total government expenditure,<sup>4</sup> demonstrating the financial pressure for provision of health services.<sup>3</sup>

On the other hand the extensive bureaucracy in public sector induces many problems in the health sector. These include (among other factors) focused decision-making, poor management, poor inter-level communication, and low motivation for high efficiency.<sup>5</sup>

In Iran, while both public and private sector contribute to provide health services, the public sector is responsible for the majority of health system development expenditures.<sup>6</sup> The lion share of health expenses in Iran is given to the hospitals. However, the situation of hospitals in terms of efficiency is not much satisfactory.<sup>7</sup>

Advantages associated with collaborative contribution of private and public sectors to provision of health services has embarked the policy-makers to devise bilateral solutions in which the interests of both sectors are met. A successful and extensively implemented model for such

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collaboration is the public-private partnership (PPP).<sup>8,9</sup> PPP allows the public sector to use its strengths in order to promote justice and accessibility and at the same time take the advantages of skills and experience of private sector for higher efficiency and quality.<sup>10</sup>

PPP helps each partner achieve higher efficiency compared with the situation each sector operates alone. This partnership provides opportunity to overcome the financial challenge, enables more efficient management, and bridges the gap between infrastructural needs and available resources.<sup>11</sup>

Although a number of successful health PPPs has been launched and operated successfully in Iran, a comprehensive and coherent conceptual model for implementation of such partnerships is lacking. This lack contributes at least partially to the slow pace of supportive legislation and governmental support of health PPP development as well as obscurity of benefits from such partnership to the private sector. To contribute to filling this gap, this study was designed to develop a native model for PPP in the Iranian health context, based on the international experience and domestic constraints.

## Methods

A comparative study of PPP implementation in seven pioneer countries, including Canada, England, Germany, Brazil, India, Thailand, and Lesotho was carried out using content analysis method. As a result, 53 elements potentially influencing development of PPP were identified. The published literature was further explored with respect to the identified elements resulting in formulation of a 53-item questionnaire. The validity of the questionnaire was sought by expert opinion method (57 experts). As a result, 15 items were excluded and some other items were revised according to the expert advises. The resulting questionnaire comprised 38 items, scored on a 5-point Likert-type scale (from 1 = "very weak" to 5 = "very strong"). The reliability of the questionnaire was ensured by Cronbach  $\alpha$  of 0.85.

The questionnaire was distributed among a sample of 220 individuals purposefully selected from among physicians and medical board members, policy makers, and experts from medical universities, the Ministry of Health and Medical Education (MOHME), hospital chief executive officers (CEOs).

The collected data was analyzed using exploratory factor analysis (EFA) to identify the factor structures underlying the data loadings across these factors. The sufficiency of sample size for factor analysis was ensured by Kaiser-Meyer-Olkin (KMO) score of 0.67. Bartlett test of sphericity resulted indicated the significance of the corre-

lation matrix. Levene test showed that distribution of variances was homogeneous ( $P > 0.05$ ). Principal component analysis was then performed with varimax rotation for factor extraction. The internal consistency reliability of the extracted factors was calculated using Cronbach  $\alpha$ . The models were then validated by confirmatory factor analysis (CFA). A series of goodness-of-fit indices including comparative fit index (CFI), goodness-to-fit index (GFI), adjusted goodness-to-fit index (AGFI), and root mean squared error of approximation (RMSEA) were considered to evaluate the quality of model fit.

## Results and Discussion

### Literature Review

Table 1 summarizes the PPP-supporting efforts made by the pioneer countries in terms of legislation, policy-making, financing, capacity building and social orient. Among these efforts are distributed legislation in Canada, and development of supporting laws in Brazil, and policy-making aimed at protection of PPP in Lesotho.<sup>12-14</sup>

### Explanatory Factor Analysis and Model Improvement

We performed factor analysis with solutions with various number of factors. Ultimately, the 5-factor solution turned out to be more consistent. Due to inadequate internal consistency of some extracted factors, a model improvement procedure was carried out. To develop more reliable model, an iterative cycle of model modification was run for each construct, and at each run, a single item that had low factor loading and communality was dropped from the model. Although the extracted factor in three methods was found to be almost identical, the varimax results which required less eliminated items, was chosen. The criteria for stopping the procedure were factor loadings of more than 0.3 for all items. The criteria were met for the constructs after removal of eight items from various factors. Table 2 shows the specific value, variance, and the cumulative variance of 5 factors. The specific values of all factors were higher than one. The identified factors together explain 66.52 of the total variance of the variables. Also internal consistency reliability of the 30-item was calculated to be 0.71. Reliability analysis of the factors in improved model identified adequate levels of internal consistency for all factors ( $\alpha > 0.7$ ).

Based on their content, the factors were nominated as the following: Factor 1: Legislation, Factor 2: Policy-making, Factor 3: Financing, Factor 4: Capacity building, and Factor 5: Social orient. Table 3 presents the items of each factor and corresponding the factor loading.

The resulting model was validated by CFA. Results of fitness data analysis with single factor model (Table 4)

Table 1. Summary of Supportive Strategies for Hospital PPP Development in Pioneer Countries

The Name of Country	Effective Variable			
	Legal	Policy	Financial	Social
Canada	<ul style="list-style-type: none"> <li>- There is no specific law – agreed rules in the contract + framework of public interest protection</li> </ul>	<ul style="list-style-type: none"> <li>- Normative Neoliberal policies and marketization promotion + depoliticization of the PPT bureaucracy</li> <li>- Introducing DBFO as the best hospital PPP model</li> <li>- Using PFI to provide clinical services</li> </ul>	<ul style="list-style-type: none"> <li>- Return on investment of private sector in the long-term by the public sector</li> <li>- Financial support from insurance companies</li> <li>- Financial support of doctors by the public sector</li> </ul>	<ul style="list-style-type: none"> <li>- Promoting medical education and research and business activities</li> <li>- Encouraging innovation and innovative care</li> </ul>
England	<ul style="list-style-type: none"> <li>- There is no specific law</li> <li>- Agreed rules in the contract + OTF advice and support</li> </ul>	<ul style="list-style-type: none"> <li>- Decentralization policies + PPP units creation in ministries</li> <li>- Devolution Incentives</li> </ul>	<ul style="list-style-type: none"> <li>- An annual grant from the NHS Trust, to the private sector</li> <li>- Allocation of loans to the private sector by banks</li> </ul>	<ul style="list-style-type: none"> <li>- Improving the standards of hospital care</li> <li>- Modernization of facilities and services</li> </ul>
Brazil	<ul style="list-style-type: none"> <li>- Draft of PPP law + Coordination, approval and supervision of the Ministry of Planning and National Monetary Council</li> </ul>	<ul style="list-style-type: none"> <li>- Decentralization policies + competition encouraging policies</li> <li>- The public sector Monitoring on projects progress and contracts</li> <li>- Developing public sector capacity for new investment</li> <li>- Project management and risk assessment</li> </ul>	<ul style="list-style-type: none"> <li>- Return on investment of the private sector by public sector</li> <li>- Allocation of Loans for PPP investment</li> </ul>	<ul style="list-style-type: none"> <li>- Promotion of professional researchers to foster innovation in educational capacity building</li> </ul>
Germany	<ul style="list-style-type: none"> <li>- There is no specific law</li> <li>- Procurement rules are fully implemented for PPP + agreed rules in the contract</li> </ul>	<ul style="list-style-type: none"> <li>- Policies to support small companies to join the PPP</li> <li>- Promotion of the BTO model for PPP</li> <li>- General supervision of the public sector</li> </ul>	<ul style="list-style-type: none"> <li>- Compensation of costs by public sector in the case of bad performance of the private partner</li> <li>- Allocation of loans to the private sector by banks</li> <li>- The general financial compensation, life cycle and value for money</li> </ul>	<ul style="list-style-type: none"> <li>- Improved quality and standards of hospital services</li> <li>- Modernization of facilities and services</li> </ul>
Lesotho	<ul style="list-style-type: none"> <li>- There is no specific law</li> </ul>	<ul style="list-style-type: none"> <li>- Ministry of Health support of PPP and outsourcing hospital services + public sector supervision</li> </ul>	<ul style="list-style-type: none"> <li>- Fixed annual salary from public sector to the private partner</li> </ul>	<ul style="list-style-type: none"> <li>- Promoting education and motivation of doctors, specialists and staff</li> <li>- Attracting Skills, money and management of private sector</li> </ul>
Thailand	<ul style="list-style-type: none"> <li>- A separate chapter on PPP in the Constitution + draft of PPP law</li> <li>- Three decision making, policy and regulation committees</li> </ul>	<ul style="list-style-type: none"> <li>- Encouragement of private sector partnership</li> <li>- Infrastructure development</li> <li>- The accountability of public sector to improve the efficiency and effectiveness of PPP</li> </ul>	<ul style="list-style-type: none"> <li>- Allocation of low-interest loans to invest on PPP</li> <li>- Financial model value for money</li> </ul>	<ul style="list-style-type: none"> <li>- Monitoring public interest</li> <li>- Improving the referral system</li> </ul>
India	<ul style="list-style-type: none"> <li>- There is no national comprehensive law</li> <li>- PPP Financial, monitoring and development committees + Legal, political and financial support of the public sector</li> </ul>	<ul style="list-style-type: none"> <li>- Encouraging competition policy</li> <li>- Supervision of the public sector on PPP</li> <li>- Promoting BOT and DB model in PPP</li> </ul>	<ul style="list-style-type: none"> <li>- Loans and facilities from development funds</li> <li>- The annual financial assistance from the public sector to the private partner</li> </ul>	<ul style="list-style-type: none"> <li>- Increased access to hospital services</li> <li>- An increase in private insurances</li> <li>- Free services to poor people</li> <li>- Health insurance for the poor</li> </ul>
Iran	<ul style="list-style-type: none"> <li>- Iran's 20-year vision plan</li> <li>- the fourth and fifth laws of development</li> </ul>	<ul style="list-style-type: none"> <li>- Support of the Ministry of Health from PPP and outsourcing hospital services</li> <li>- Supervision of the Ministry of Health on contracts</li> </ul>	<ul style="list-style-type: none"> <li>- Allocation of low-interest loans from banks</li> <li>- Paying salaries to staff from the public sector</li> </ul>	<ul style="list-style-type: none"> <li>- Improving Medical Education and Research</li> <li>- Limited implementation of PPP projects with NGOs</li> </ul>

**Table 2.** Specific Value, Variance Percentage, and the Cumulative Variance Percentage of the Identified Factors

Factors	Specific Value	Variance Percentage	5 Factors Cumulative Variance (%)
H	6.422	21.407	21.407
S	3.953	13.178	34.585
M	3.792	12.640	47.224
Z	3.634	12.112	59.337
E	2.155	7.183	66.520

shows that the single model is properly fitted with data which makes it explicit that the linear combination of 5-factor components in the questionnaire can build up the public and private partnership model for public hospitals in Iran.

Among items related to legislation, the “role of specific headquarters in supervising partnership plan” gained the highest factor loading. Consistently, Ghamami identified reliable legal and lawful structure for support of the private sector’s interests as a prerequisite to successful implementation PPP.<sup>15</sup>

Among items related to policy-making, “focus of PPP policies on services quality” gained the highest factor loading. Quality of public services has also been highlighted

in previous reports as an influential factor for promoting contribution of private sector to health services delivery.<sup>16</sup>

Among financial factors, “development of a relevant and standard financial management system” represented the highest factor loading. The same factor is reported to be crucial to development of PPP in the Brazilian health system.<sup>17</sup>

Among factors related to capacity building “training and empowerment of hospital employees” gained the highest factor load. According to the study of Jaafari, employee empowerment and improved managerial skills in public organizations are crucial to establish successful partnership between public and private sectors.<sup>18</sup> Raman and Björkman in their study on PPP in India Health Sector identified the capacity building as an avenue to improved skills and competency in the health human resources, which in turn can help improve structures and processes essential for implementation of PPP.<sup>16</sup>

## Conclusions

In this study, we developed a conceptual framework for the implementation of PPP in Iranian health facilities. Our

**Table 3.** Factor Loading for Items in Exploratory and Confirmatory Analysis

Main Factors	Factors	Abbreviation	Exploratory Loading Factor	Confirmatory Loading Factor	
Legislation	Political decision based on consensus to develop public and private partnership	h1	0.53	0.77	
	Developing legal infrastructures to facilitate partnership	h4	0.59	0.42	
	Granting certification for healthcare public and private partnership	h5	0.61	0.24	
	Establishing specified headquarter with a duty to update public and private partnership	h6	0.40	0.55	
	Comprehensive supervision of partnership plans	h7	0.68	0.82	
	Clarifying the contract scope (size of the capital, risk-sharing mechanism, contract duration, parties' commitments)	h8	0.49	0.11	
	Policy-making	Reducing bureaucracy and preventive laws	s1	0.45	0.03
		Understanding and addressing PPP plans' problems	s2	0.32	0.14
Focus of policies on the value of money in public and private partnership plan		s3	0.70	0.86	
Focus on services quality		s4	0.84	0.16	
Setting competence inspiring policies for PPP		s5	0.61	0.31	
Financial	Setting clear financial goals	m1	0.35	0.80	
	Specifying the situation of government financial aids	m2	0.34	0.81	
	Promoting the partnership of insurance organizations	m3	0.78	0.52	
	Specifying a clear mechanism for capital repayment of private sector	m4	0.52	0.69	
	Establishing a standard accounting and financial management system based on financial model of the PPP plan	m5	0.80	0.49	
	Dependence of finance in private sector to risk sharing and interest rate	m7	0.33	0.47	
	Capacity Building	Provision of training and research services by the participating hospitals	z1	0.77	0.73
Developing managerial instructions		z2	0.81	0.12	
Encouraging private sector to invest in PPP		z3	0.70	0.82	
Promoting research-based in health management		z4	0.77	0.47	
Education-based improvement of health care service management		z5	0.53	0.58	
Training and empowering hospital employees		z6	0.74	0.95	
Improving quality of work life of the managers and employees		z7	0.76	0.66	
Running pilot projects in order to gain better managerial insights		z8	0.35	0.49	
Social	Attention to the public benefits and demands in partnership plan	e1	0.83	0.85	
	Facilitating delivery of services to medium- and low-income families	e2	0.79	0.47	
	Providing discount to individuals belonging to weak social and economic classes	e3	0.84	0.46	
	Emphasize on satisfaction of patients and their visitors and visitors	e4	0.81	0.88	
	Emphasize on environmental concerns	e5	0.81	0.81	

**Table 4.** Fitness Data Analysis for Single Factor Model

CFI	AGFI	GFI	RMSEA	P	df	$\chi^2$
0.799	0.732	0.842	0.022	0.001	398	5604.963

framework consists of five dimensions including Legislation, Policy-making, Finance, Capacity building, Social orient. We speculate that implementation of PPP with according to the requirements of these factors will result in alleviation of present inefficiencies in Iranian hospitals together with enhanced quality of care and patient satisfaction.

### Abbreviations

(PPP): public-private partnership.

### Competing Interests

The authors declare no competing interests.

### Authors' Contributions

MB was involved in the study design, collecting and analyzing the data, and drafting the manuscript. SJT and MRM contributed to designing the study and revising the manuscript. AAN contributed to data analysis. All authors read and approved the final manuscript.

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