



# Identification and Prioritization of Dimensions for Empowering Hospitalized Patients in Public Hospitals of Shahid Sadoughi University of Medical Sciences, Yazd

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## ABSTRACT

Identifying factors that impact patient experience is crucial for implementing strategies that support patient engagement and ultimately achieve better health outcomes. This study aimed to present a model for empowering hospitalized patients. This study is a quantitative-qualitative cross-sectional study conducted using stratified sampling with appropriate allocation in public hospitals affiliated with Shahid Sadoughi University of Medical Sciences, Yazd. The study involved 230 participants, including hospital directors, managers, matrons, supervisors, clinical and paraclinical unit heads, staff units, nurses, and physicians. Data were collected using demographic information tools and a researcher-made questionnaire designed to create a model for empowering hospitalized patients. The model's capability was determined by fitting the data using confirmatory factor analysis. Data were analyzed using SPSS version 16 and Amos version 24 software. The questionnaire designed for the patient empowerment model in hospitals comprised 8 domains and 61 items or components. In this study, the chi-square ratio to degrees of freedom was significant ( $p < 0.0001$ ), indicating a good fit for the model. The Goodness of Fit Index (GFI) was estimated at 0.93, showing that the model fit was appropriate. The values of GFI and the Adjusted Goodness of Fit Index (AGFI) for the hospitalized patient empowerment model were above 0.8. Organizations and educational healthcare centers can use this model to empower patients. The necessary groundwork for enhancing patient empowerment should be provided by medical universities and affiliated hospitals.

**Keywords:** Empowerment, Hospitals, Patients.

## 1. Introduction

Today, numerous decisions and choices are being discussed in healthcare, complicated by increasing treatment and care costs, limited healthcare resources, and changing disease patterns, leading to various debates regarding the efficacy of different treatments. In this context, programs and interventions based on providing self-management information result in positive changes in attitudes and beliefs, improved health-related information, and the development of health skills and performance (1).

The patient experience during hospitalization is often stressful, as each patient faces uncertainties about their health changes. However, the hospital environment can act as a catalyst for patient engagement, integrating patients as active participants in their ongoing healthcare (2, 3). Identifying factors that impact the patient experience is essential for implementing strategies that support patient engagement, ultimately achieving better health outcomes. To improve patient engagement, moving towards patient-centered care seeks to address factors such as care coordination, communication, and the involvement of family and friends that affect the patient experience (4).

Designing a healthcare system to understand how patients can experience a sense of ownership of their health and establish stronger relationships with their providers is of high importance (2). Given the environmental and personal stresses patients face in hospitals, it seems that proper education with appropriate methods can alleviate many of their concerns, giving them a sense of more control over their health and illness (5). During hospitalization, poor access to personal information, communication barriers, and uncertainties are factors that make patients prone to anxiety (6). Empowering patients may help reduce some of this anxiety by helping patients and their families better understand the care they receive and the hospital experience (7).

Studies on patient empowerment during hospitalization have been conducted (2, 3, 8, 9). However, no specific research has been conducted on designing a model for empowering hospitalized patients. The absence of a comprehensive study and model that includes all aspects of patient empowerment, along with the increasing need for full and informed participation of patients and their families in their treatment process (10), motivated this study to

comprehensively evaluate the variables and elements required for patient empowerment to design and present a model. Given the role of patient and family willingness and ability to participate in treatment, particularly during hospitalization, the effectiveness of treatment will be better, easier, and more effective when, in addition to accurate diagnosis, there is greater patient support, cooperation, and awareness. Achieving this will result in cost reduction, greater satisfaction, and higher productivity. One of the critical aspects of empowering patients and their families scientifically and practically during treatment and other situations will be operationalized through a comprehensive empowerment model. This study presents this model based on related factors and results; in fact, the empowerment model contains many concepts that can be examined. The purpose of this study is to identify and present a model for empowering hospitalized patients in the public hospitals of Shahid Sadoughi University of Medical Sciences, Yazd.

## 2. Methods and Materials

### 2.1. Study Design and Participants

This study is of applied research with a mixed-methods, quantitative-qualitative approach, and it is descriptive in nature. The research population consisted of all employees in public hospitals affiliated with Shahid Sadoughi University of Medical Sciences, Yazd, who held organizational positions (a population of 4800). A sample size of 230 individuals from this population was selected using stratified sampling with appropriate allocation based on the number of employees in each hospital, including hospital directors, managers, matrons, supervisors, clinical and paraclinical unit heads, staff units, nurses, and physicians.

To collect relevant information, the following four steps were used:

Extracting and finalizing titles: In this step, the researcher conducted a systematic review from 2005 to 2023 in international databases such as PubMed, Web of Science, Scopus, Science Direct, Web of Knowledge, EBSCO, Wiley, ISI, Elsevier, Embase databases, and Google Scholar search engine using keywords related to the study title "empowerment model" and limited to the United Kingdom. The researcher carefully reviewed texts, guidelines, and

documents and conducted interviews with experts and authorities to obtain necessary information. In the comparative study of patient empowerment in Iran and the United Kingdom, the researcher described and explained key factors and differences, extracting significant and influential factors.

**Identifying dimensions and prioritizing:** In this phase, significant factors related to patient empowerment were identified and prioritized. The researcher conducted a qualitative study through interviews with experts and authorities to identify important dimensions, shared key factors from the current situation and comparative study, and used statistical and qualitative prioritization methods. In this phase, a questionnaire for designing the hospitalized patient empowerment model was developed and distributed to 230 hospital directors, managers, matrons, supervisors, clinical and paraclinical unit heads, staff units, nurses, and physicians in the public hospitals of Shahid Sadoughi University of Medical Sciences, Yazd. After completing the questionnaires, data were entered into SPSS version 16 and analyzed using statistical tests and qualitative prioritization methods.

**Designing the model:** Using the results from the first phase, including observed and extracted interview codes, laws and guidelines, comparative study results, and significant factors identified through interviews with experts and authorities, the researcher created a model. Two other researchers separately reviewed the model, resolved discrepancies, and finalized the design, reporting the hierarchy and subcategories in order of priority.

**Model validation:** The designed model's capability was determined by fitting the data using confirmatory factor analysis.

Data collection in this research was done using a two-part tool: a) demographic information tool and b) a questionnaire designed to create a model for empowering hospitalized patients.

### 3. Findings and Results

The Friedman test was used to rank the domains. The Friedman test showed that the importance and rank of each of the dimensions related to the empowerment of hospitalized patients are different ( $p < 0.005$ ); however, the importance and rank of each dimension within the outcome

domain were the same ( $p=0.465$ ). The comparison of mean ranks indicates that the most important dimensions in the resources and elements domain are nurses, physicians, and the patients themselves, with mean ranks of 8.78, 8.26, and 7.40, respectively. The least important factor in the empowerment of hospitalized patients is neighboring patients, with a mean rank of 3.53.

The comparison of mean ranks indicates that the most important dimensions in the domains and dimensions are acute illness, psychological aspects of the patient, and mental and cognitive aspects of the patient, with mean ranks of 4.78, 4.40, and 4.12, respectively. The least important was patient self-medication, with a mean rank of 3.07.

The comparison of mean ranks indicates that the most important dimensions in the infrastructure/environment and community are hospital staff experience, the patient's surrounding living environment, and the patient's capacity and self-confidence, with mean ranks of 5.56, 5.22, and 5.09, respectively. The least important was the availability of parallel accessible services, with a mean rank of 3.06.

The comparison of mean ranks indicates that the most important dimensions in the characteristics/requirements/prerequisites domain are the willingness and interest of the healthcare staff, the knowledge of the healthcare staff, and the ability and skills of the healthcare staff, with mean ranks of 7.61, 7.32, and 6.93, respectively. The least important was patient trust and self-confidence, with a mean rank of 4.66.

The comparison of mean ranks indicates that the most important dimensions in the outcomes domain are continuous and appropriate evaluation and review of the process of providing services to patients, self-care, and cost management, with mean ranks of 5.12, 4.99, and 4.75, respectively. The least important was patient foresight, with a mean rank of 3.77.

The comparison of mean ranks indicates that the most important dimensions in the tools domain are the use of films, pamphlets, brochures, and self-care booklets, with mean ranks of 4.76, 4.06, and 4.03, respectively. The least important was websites, with a mean rank of 3.86.

The comparison of mean ranks indicates that the most important dimensions in the methods domain are face-to-face education, workshops, family classes, and group classes, with mean ranks of 5.32, 4.15, 4.12, and 4.06,

respectively. The least important was patient lectures (speeches), with a mean rank of 3.10.

In the present study, the chi-square ratio to degrees of freedom was significant ( $p < 0.001$ ), and the chi-square divided by the degrees of freedom was 2.40, indicating a good fit of the model. The Goodness of Fit Index (GFI) was estimated to be 0.93, showing that the model fit was appropriate. The GFI and Adjusted Goodness of Fit Index (AGFI) values for the hospitalized patient empowerment model were above 0.80 (the closer to one, the better the fit of the model to the observed data), confirming the results of the chi-square test. The Root Mean Square Residual (RMR) was 0.107 (the closer the model test to zero, the better the

fit), indicating a good explanation of the covariances. High values above 0.80 for the Normed Fit Index (NFI) and Non-Normed Fit Index (NNFI) and values above 0.90 for the Incremental Fit Index (IFI) and Comparative Fit Index (CFI) indicate a very good fit of the designed model (Table 6). The Root Mean Square Error of Approximation (RMSEA) is the root mean square of the approximation error. This index is 0.05 or less for good models. A model with this index 0.10 or more has a poor fit. The very low value of this index for the confirmatory factor analysis model of the components necessary for empowering hospitalized patients used in this study indicates a relatively good fit and an appropriate design of the study (Table 1).

**Table 1**

*Model Fit Indices for the Confirmatory Factor Analysis Model Presented (n=230)*

Index	Criteria	Reported Value
RMR	Between 0 and 1	0.107
GFI	> 0.85	0.892
AGFI	> 0.80	0.830
NFI	> 0.80	0.840
NNFI	> 0.80	0.810
IFI	> 0.90	0.910
CFI	> 0.90	0.910
RMSEA	< 0.80	0.032

The indices with the t-value shown in Table 2 were significant ( $p < 0.001$ ). All indicators had significant factor loadings on their respective constructs. Overall, the result indicates that at the first factor level, the indicators have a significant interaction with their constructs, and all indices can be considered valid for measuring this design.

The relationship between factors is called the gamma coefficient. In Table 7, the factor loadings between the constructs are shown. Based on the results of the confirmatory factor analysis, the studied domains in the hospitalized patient empowerment model significantly show their impact. Thus, the present model structure, given the significance of all 61 items forming the eight domains in the research model, has a statistically acceptable foundation for accepting the relationship between items.

Next, the validity of the identified indicators was evaluated through a survey of 10 organizational and academic experts using the fuzzy Delphi method. The purpose of using the fuzzy Delphi method was to assess the

suitability of the identified indicators and provide supplementary suggestions to complete the initial model. The Delphi method is an accepted approach to achieving expert consensus. The steps of this technique and its results are explained below.

**Collecting Expert Opinions:** Experts were asked to specify the suitability of the identified indicators on a scale with linguistic variables including: very low, low, medium, high, and very high. They were also asked to provide corrective and supplementary suggestions if deemed necessary.

**Calculating the Fuzzy Value of Each Question:** Based on the collected data, the fuzzy value for each indicator was calculated.

**Converting the Obtained Fuzzy Values of Each Indicator to Defuzzified Values (Sj):** After calculating the fuzzy value for each research indicator, these values were defuzzified using Chang's method for comparison purposes.

**Table 2**

*Standardized Factor Loadings with Significance Level (Significance at 95% Confidence Level, Error 0.05)*

Domain	Indicator	Standardized Factor Loadings	Standard Deviation	t	P-value
Resources and Elements	Q11	1.00			
	Q10	0.88	0.071	12.482	0.001>
	Q9	0.88	0.076	11.652	0.001>
	Q8	0.63	0.054	11.905	0.001>
	Q7	0.84	0.076	11.026	0.001>
	Q6	0.46	0.055	8.427	0.001>
	Q5	-0.34	0.072	-4.726	0.001>
	Q4	-0.42	0.085	-4.955	0.001>
	Q3	-0.12	0.083	-1.548	0.022
	Q2	-0.23	0.068	-3.526	0.001>
Domains and Dimensions	Q1	-0.44	0.074	-6.026	0.001>
	Q18	1.00			
	Q17	1.45	0.195	7.45	0.001>
	Q16	0.21	0.160	1.32	0.016
	Q15	1.78	0.237	7.55	0.001>
	Q14	2.11	0.241	8.75	0.001>
	Q13	2.08	0.239	8.71	0.001>
Characteristics/Requirements /Prerequisites	Q12	1.11	0.149	7.47	0.001>
	Q27	1.00			
	Q28	0.85	0.073	11.71	0.001>
	Q29	0.85	0.070	12.14	0.001>
	Q30	0.81	0.065	12.62	0.001>
	Q31	0.69	0.053	12.99	0.001>
	Q32	0.49	0.054	9.11	0.001>
	Q33	0.50	0.055	9.16	0.001>
	Q34	0.88	0.064	13.81	0.001>
	Q35	1.14	0.088	13.08	0.001>
Methods	Q36	1.02	0.062	16.48	0.001>
	Q37	0.89	0.077	11.65	0.001>
	Q55	1.00			
	Q56	4.63	0.718	6.46	0.001>
	Q57	2.24	0.368	6.09	0.001>
	Q58	1.16	0.223	5.22	0.001>
	Q59	1.39	0.282	4.94	0.001>
Infrastructure/Environment/Community	Q60	0.67	0.195	3.44	0.001>
	Q61	2.49	0.422	5.91	0.001>
	Q26	1.00			
	Q25	1.79	0.297	6.04	0.001>
	Q24	1.12	0.217	5.19	0.001>
	Q23	2.68	0.381	7.03	0.001>
	Q22	0.01	0.138	0.08	0.033
Outcomes	Q21	1.38	0.240	5.78	0.001>
	Q20	1.52	0.254	5.99	0.001>
	Q19	2.82	0.422	6.68	0.001>
	Q38	1.00			
	Q39	1.21	0.122	9.97	0.001>
	Q40	0.96	0.092	10.47	0.001>
	Q41	1.07	0.106	10.08	0.001>
Tools	Q42	1.38	0.126	10.93	0.001>
	Q43	1.33	0.126	10.58	0.001>
	Q44	1.06	0.100	10.69	0.001>
	Q45	1.07	0.107	10.11	0.001>
	Q54	1.00			
	Q53	1.06	0.069	15.36	0.001>
	Q52	0.80	0.069	11.71	0.001>
	Q51	0.88	0.063	14.10	0.001>
	Q50	1.13	0.071	15.93	0.001>
	Q49	0.79	0.064	12.32	0.001>

#### 4. Discussion and Conclusion

The findings of this study showed that in the resources and elements domain, based on the responses of participants, nurses, physicians, and the patients themselves are of high importance in the empowerment of hospitalized patients. In the domains and dimensions domain, acute illness, the psychological aspects of the patient, and the mental and cognitive aspects of the patient were of high importance in empowering hospitalized patients. Patients with acute illness need significant psychological changes to cope with their illness. In other words, acute illness affects all aspects of a person's life, and patients feel powerless in the face of many changes, so they should be prioritized for empowerment. In this domain, the experience of the hospital staff, the patient's surrounding living environment, and the patient's capacity and self-confidence are of high importance in empowering patients. The high experience of hospital staff makes patients feel more secure. Additionally, having a calm and stress-free environment around the patient can play a significant role in empowering patients. The most important dimensions in this domain are the willingness and interest of the healthcare staff, the knowledge of the healthcare staff, and the ability and skills of the healthcare staff, which can play a crucial role in empowering hospitalized patients. Continuous and appropriate evaluation and review of the process of providing services to patients, self-care, and cost management in the outcomes domain were the most important dimensions because continuous and appropriate review of the process of providing services to patients, self-care, and cost management can take a significant step in empowering hospitalized patients. The use of films, pamphlets, brochures, and self-care booklets can play an important role in empowering patients. Face-to-face education, workshops, family classes, and group classes were of high importance because increasing education can improve patient empowerment. The results of the confirmatory factor analysis showed that all 11 dimensions of resources and elements impact the empowerment of hospitalized patients, with some having a positive impact. The results of the confirmatory factor analysis showed that all eight dimensions in the domains and dimensions domain impact the empowerment of hospitalized patients. The results of the confirmatory factor analysis showed that all

seven dimensions in the infrastructure/environment and community domain impact the empowerment of hospitalized patients. The results of the confirmatory factor analysis showed that all 11 dimensions in the characteristics/requirements/prerequisites domain impact the empowerment of hospitalized patients. The results of the confirmatory factor analysis showed that all eight dimensions in the methods domain, six dimensions in the tools domain, seven dimensions in the outcomes domain, and three dimensions in the outcomes domain impact the empowerment of hospitalized patients. Through in-depth exploration of nurses' experiences in the field of empowering hospitalized patients, innovative strategies that nurses use to overcome empowerment barriers can be utilized. The high importance of nurses in empowering patients may be because nurses can provide opportunities for patients to make choices about their care, such as participating in dressing changes. Empowerment interventions designed to improve patient engagement in care should focus on the ethical principles of patient autonomy and independence. Nurses may also educate patients about their right to participate in care and the types of questions they may want to ask healthcare providers to make informed decisions about their care. In this study, after nurses, physicians had high importance in empowering patients; the patient-provider relationship has been confirmed in previous studies and is consistent with the findings of this study (11, 12). The reason may be related to the impact of effective communication. Shared decision-making between providers and patients is generally considered an effective way to improve the quality of healthcare and patient satisfaction (12). Recent studies indicate that patient-provider communication, such as practicing interpersonal exchange and goal setting, can significantly improve patient engagement (13); in this study, a high importance of providers in empowering patients was observed. The priority of the patients themselves was ranked third. Therefore, patients are at the center of our proposed framework. Treatment outcomes can only be optimized if patients actively participate in their treatment and take responsibility for their health. Healthcare providers, the community environment, and the healthcare delivery system can separately or simultaneously affect patients' knowledge, confidence, or self-determination to improve patient

activation and empowerment. Improving patient activation and empowerment, in turn, may help the patient-provider relationship and increase the efficiency of healthcare delivery systems (13).

In the present study, a model for empowering hospitalized patients was designed from the perspective of service providers, and eight important domains in patient empowerment were identified. The results of the confirmatory factor analysis showed that all dimensions in the domains of resources and elements, domains and dimensions, infrastructure/environment and community, characteristics/requirements and prerequisites, methods, tools, outcomes, and results impact the empowerment of hospitalized patients. Empowering hospitalized patients is impossible without implementing participatory management programs, so organizations and educational healthcare centers can use this model to empower patients. The necessary groundwork for enhancing patient empowerment should be provided by medical universities and affiliated hospitals. Additionally, using creative and innovative methods in educational approaches can indirectly improve the empowerment process. Future studies are recommended to examine the impact of acute illness, the psychological aspects of the patient, and the mental and cognitive aspects of the patient on the empowerment of hospitalized patients through clinical trials or descriptive-analytical studies. Examining the impact of hospital staff experience, the patient's surrounding living environment, and the patient's capacity and self-confidence on the empowerment of hospitalized patients through clinical trials or descriptive-analytical studies is recommended. The impact of the willingness and interest of the healthcare staff, the knowledge of the healthcare staff, and the ability and skills of the healthcare staff on the empowerment of hospitalized patients should be studied through clinical trials or descriptive-analytical studies. The impact of continuous and appropriate evaluation and review of the process of providing services to patients, self-care, and cost management on the empowerment of hospitalized patients should be examined through clinical trials or descriptive-analytical studies. The impact and comparison of educational methods such as films, pamphlets and brochures, and self-care booklets on the empowerment of hospitalized patients should be studied through clinical trials

or descriptive-analytical studies. Additionally, examining the impact and comparison of face-to-face education, workshops, family classes, and group classes on the empowerment of hospitalized patients through clinical trials or descriptive-analytical studies is recommended.

### Authors' Contributions

S.A.D.S. conceptualized the study, designed the research methodology, and supervised the data collection process. S.H., the corresponding author, conducted the data analysis using SPSS and Amos software, interpreted the results, and led the drafting and revising of the manuscript. R.B.K. assisted with participant recruitment, supported the development and validation of the researcher-made questionnaire, and contributed to the literature review. All authors participated in discussing the findings, critically reviewed the manuscript for important intellectual content, and approved the final version for publication.

### Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

### Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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### Declaration of Interest

The authors report no conflict of interest.

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### Ethics Considerations

The study placed a high emphasis on ethical considerations. Informed consent obtained from all participants, ensuring they are fully aware of the nature of

the study and their role in it. Confidentiality strictly maintained, with data anonymized to protect individual privacy. The study adhered to the ethical guidelines for research with human subjects as outlined in the Declaration of Helsinki.

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