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Needs assessment and research priorities in the oral and dental health with health promotion approach in Iran

Esmail Rafie, Mazyar Karamali, Mohammadkarim Bahadori¹, Mohsen Yazdanian, Ramin Ravangard²

Abstract:

BACKGROUND: Today, the scope of dental activities is a broad range from the needs assessment for epidemiological studies to the implementation of comprehensive programs for the prevention of oral diseases at various levels of the society. This study aimed to identify and prioritize the need researches in the field of oral and dental health in a dental hospital in Tehran, Iran.

METHODS: This applied research was a mixed methods study carried out in Tehran, Iran, in 2018. The data gathering tool included a data collection form used for reviewing the documents, a semi-structured interview, and an open questionnaire. MAXQDA 10.0, Expert Choice 11.0, and Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) software were used for analyzing the collected data.

RESULTS: After analyzing the results of the qualitative phase, 171 research topics in 6 areas were obtained, including 44 topics in “dental clinical care and treatment,” 37 topics in “health and prevention,” 19 topics in “education and health promotion,” 37 topics in “management of dental care delivery,” 16 topics in “policy and its requirements,” and 18 topics in “dentistry materials, equipment and technologies.”

CONCLUSION: According to the results, it can be recommended that the research resources should be allocated based on the priorities identified by the present study so that the studied hospital has the highest dynamic performance in achieving its goals and objectives.

Keywords:

Analytical hierarchy process, dental health, dental hospital, oral, research needs assessment, Technique for Order of Preference by Similarity to Ideal Solution

Introduction

Oral and dental health has been considered as an essential component of public health, and the findings of various studies have confirmed its relationship with physical, psychological, and social dimensions of health. Given the relationship between oral diseases and the lifestyle and quality of life, it can be said that oral health affects various dimensions of the individuals' life.^[1-4] Oral and dental

problems are paid special attention in public health and prevention dentistry for many reasons. These diseases are almost universal and rarely can be found anyone who has not been affected by them throughout his/her lives.^[5]

Providing oral health services in dental centers and hospitals around the world faces many problems. Insufficient specialists, resource constraints such as limited financial and workforce, patients' issues, and lack of basic required infrastructure

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Research Center for Prevention of Oral and Dental Diseases, Baqiyatallah University of Medical Sciences, Tehran, Iran, ¹Health Management Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran, ²Health Human Resources Research Center, School of Management and Information Sciences, Shiraz University of Medical Sciences, Shiraz, Iran

Address for correspondence:

Dr. Mohammadkarim Bahadori, Health Management Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran.
E-mail: bahadorihealth@gmail.com; m.bahadori@bmsu.ac.ir

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are some barriers to the provision of oral health care for the community.^[6] Equity in the access to health-care facilities for all people in order to maintain and promote their health can be ensured if the health-related systems conduct needs assessment studies on the issues and problems of the target community.^[5,7]

Understanding the needs provides a good opportunity for designing targeted programs to meet the desired needs.^[8] In this regard, the patient-centered approach and studying the outcomes of personal and social problems resulting from oral and dental diseases have been paid special attention. However, in the past, because of the information gap between the patients and dentists, the disease biomedical and specialist-focused approach was dominant. Therefore, the scope of dental activities is a broad range from the needs assessment for epidemiological studies to the implementation of comprehensive programs for the prevention of oral diseases at various levels of the society.^[5,9]

Conducting researches in the field of health by producing new knowledge through better science and technology and providing evidence-based decision-making not only improves lifestyles and promotes health but also is a necessity for social and economic development. Therefore, it seems that the first step in achieving sustainable development is to understand the urgent need to advance the researches on health.^[10,11] Considering the need for a logical link between researches and needs, first, problems should be identified, and then, given the resource constraints, the research priorities should be determined.^[1,12] Today, many experts and scholars believe that the researches are the basis for new knowledge creation and have a special role in solving problems with which a system faces.^[13]

According to Bader *et al.*, given the financing the researches in the field of dentistry, it is expected that the findings lead to significant improvements in oral health. Unfortunately, studies carried out in the field of oral and dental health, in comparison with those in other fields of medical and health sciences, are not in line with the actual and practical needs because dental literature is influenced by observational studies, short-term studies, surveys, and technical reports. On the other hand, the reason for the lack of researches in this field is often related to the budget constraints.^[14] For instance, the Australian National Health and Medical Research Council annually approves nearly \$ 700 million for conducting health and medical researches, and despite the costs of dental care, for example, \$ 9 billion in 2013, the dental research budget has not mentioned as a priority area. While between 2011 and 2015, cancer, mental health, diabetes, and cardiovascular diseases have received the largest share of this budget.^[15,16]

The results of the Celeste *et al.*'s study show that the focus of oral and dental health researches has been on the tooth decay and children and adolescents' health care, and in recent years, the focus of such studies on the health behaviors, health education promotion, quality of life, and socioeconomic factors has increased.^[17] Due to the diversity and scope of health issues and also resource constraints, it is impossible to work in all these areas and to meet all the research needs of the community.^[18,19] On the other hand, Chalmers and Glasziou in their study state that almost 85% of investment in the research field is wasted because of the lack of prioritization and low compliance with stakeholders' needs.^[20] The proper prioritization of future researches will increase the value of research, especially at the time of resource constraints.^[21] It is also argued that the necessity of prioritizing researches is to systematically promote the scientific basis of each field and stimulate and direct national and institutional research efforts.^[22]

Determining research priorities is a dynamic process in which many organizations and institutions involve and is known as a method for resource allocation.^[23-25] The needs assessment approaches and research prioritization techniques such as the Delphi method, analytical hierarchy process (AHP), and Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) as some tools for the research planners are being expanded and used.^[10,11,13]

One of the vital and sustainable indicators of research priority setting is to have an explicit strategy and a clear framework based on which the research achievements are monitored. What is important in the needs assessment process is the agreement of all stakeholders on the list of priorities which should ideally be provided with the participation of stakeholders and users such as decision-makers, policy-makers, and managers.^[13,26-30] Choosing a suitable model can facilitate and increase the accuracy and credibility of the needs assessment process. This study aimed to identify and prioritize the required researches in the field of oral and dental health based on a goal- and health-oriented hybrid approach with the participation of all stakeholders in a dental hospital in Tehran, Iran, in 2018.

Materials and Methods

This was an applied and mixed methods study carried out in two successive qualitative and quantitative phases in a dental hospital in Tehran, Iran, in 2018. Table 1 summarizes the study processes and methods and tools used for collecting and analyzing data in each phase.

The study sample consisted of library documents (15 documents), as well as 70 stakeholders and patients

Table 1: A summary of the study processes

Phases	Aim	Study sample	Tools used for collecting data	Methods and tools used for analyzing data	Software used
Qualitative	Needs assessment and research priorities in the field of oral health	Documents	Data extraction and data encoding form	Document Analysis	MAXQDA 10.0
		Stakeholders/service providers and service recipients	Interview guideline Open questionnaire	Deductive content analysis	
Quantitative	Determining and prioritizing research topics	Experts and stakeholders	Criteria weighting questionnaire Research topics weighed questionnaire	AHP MADM	Expert Choice 11.0 TOPSIS

TOPSIS=Technique for Order of Preference by Similarity to Ideal Solution, MADM=Multiattribute decision-making, AHP=Analytical hierarchy process

of the dental hospital in Tehran selected using the purposive sampling method. A list of stakeholders was determined using the guidelines of the Council on Health Research for Development (COHRED)^[31] in two main groups of service providers (25 experts, policy-makers, and managers) and service recipients (45 patients).

In the qualitative phase, the data gathering tool included a data collection form used for reviewing the documents, a semi-structured interview manual, and an open questionnaire. In order to determine the most important issues and the current and future needs in the field of oral and dental health in the studied dental hospital, review of documents and semi-structured interviews with 10 service recipients and providers were conducted and also the required data were collected using a researcher-made open questionnaire filled out by 60 study samples. The questions of the interviews and the open questionnaire were designed based on the goal-oriented and health-oriented hybrid approach, and the qualitative method was used to approve the face validity of the questionnaire. The initial questionnaire was sent to five university experts and the studied dental hospital managers. The experts' opinions were taken to examine the level of difficulty in understanding the phrases and words, assess the appropriateness of the items and their relationships, and determine the likelihood of ambiguity and insufficient perceptions of the phrases and words and their meanings, and some minor changes were made to the questionnaire. The interviews were recorded by a tape recorder, and to minimize bias and errors, conducting all interviews and processing and analyzing data were done only by one person. On average, each interview lasted 62 min.

The qualitative results were analyzed using MAXQDA 10.0 software through deductive (directed) content analysis method. In this method, the codes and themes are determined using the systematic classification process, in which the main categories and codes are identified based on the available theory, conceptual model or framework, previous studies of the researchers, and the results of previous studies in the studied field.^[32,33]

After analyzing the interviews and the responses to the questionnaire's items in the qualitative phase, the most important issues related to the dental and oral health and the challenges of the studied dental hospital were determined, and the required research topics were identified using the hybrid approach.

In the quantitative phase, the topics of each dimension were determined in a separate questionnaire and by getting the experts and stakeholders' opinions. Each research topic was determined and its importance was identified according to the scoring criteria based on the COHRED criteria, including the alignment with the policies and objectives of the studied dental hospital, feasibility, time priority, applicability of the results, and the scores considered, i.e., "1 = not important" to 5 = extremely important." The AHP was used to weigh the criteria.^[30]

The researchers first designed the hierarchical tree and weighted the criteria using the AHP technique. Finally, research topics were ranked based on their level of importance using TOPSIS, which is one of the multiattribute decision-making (MADM) techniques. In this method, *n* options are evaluated by *m* indexes. This technique is based on the notion that the selected option should have the least distance from the positive ideal solution (the best possible solution) and the maximum distance from the negative ideal solution (the worst possible solution). In other words, the distances between a factor and the positive or negative ideal solutions, which are the criteria for ranking and prioritizing the studied factors, are assessed.^[16] Given the unique features and capabilities of some MADM techniques, some experts and scientists have used the AHP and TOPSIS techniques in the research processes.^[11,31,34,35]

The proposed topics were given to the studied hospital experts and managers in the form of a researcher-made questionnaire in order to prioritize them based on the criteria. In the quantitative phase, Expert Choice 11.0 and TOPSIS software were used.

The present study was approved by the Ethical Committee of Baqiyatallah University of Medical

Sciences (Ethical Code: IR.BMSU.REC.283). Written informed consent was obtained from all participants in this study, and all of them were assured of the confidentiality of their information, characteristics, and responses.

Results

The results showed that most of the participants were male (62.9%), whose mean ages were 44 ± 5 in the service providers and 37 ± 5 in the recipients. The majority of the service providers had a PhD degree (32%), and most of the service recipients had a BSc's degree (35.56%). After analyzing the results of the qualitative phase, including the analyses of interviews, responses to the questionnaire's items, and participants' viewpoints on the problems and future of the oral and dental health and the challenges of the studied dental hospital, 171 research topics in 6 areas were obtained [Figure 1].

The studied COHRED criteria were weighted and ranked using the AHP technique as follows: alignment with the policies and objectives of the dental hospital, applicability of the results, time priority, and feasibility with the score of 0.347, 0.296, 0.261, and 0.096, respectively.

On the basis of weighted criteria, the research topics in each dimension were ranked using TOPSIS technique. The results of ranking research topics in each six areas from the studied experts and stakeholders' viewpoint showed that "Reviewing the status of evidence-based dentistry (EBD)" (CL: 0.714) in the dimension of dental clinical care and treatment, "Development of the protocols for the oral health and prevention of dental diseases in specific patients such as the diabetics, etc." (CL: 0.726) in the dimension of health and prevention, "Study of the dentists' training and education effects on the oral health of dental hospital patients" (CL: 0.716) in the dimension of education and health promotion,

"Designing a comprehensive pattern for evaluating the satisfaction of dental care recipients" (CL: 0.734) in the dimension of management of dental care delivery, "Development of standards for evaluating and assessing the health-oriented dental hospital" (CL: 0.665) in the dimension of policy and its requirements, and "The health technology assessment (HTA) study of using laser technology in dental treatments" (CL: 0.705) in the dimension of dentistry materials, equipment and technologies had the highest ranks. The first four research topics in each dimension have been presented in Table 2.

Discussion

Needs assessment is considered as the first step in understanding and identifying problems.^[36,37] A large part of the research planning process is devoted to the research needs assessment. In a strategic needs assessment, the external and internal factors affecting the organization's performance are examined, and the gaps between the current and desired situations are identified. Filling this gap is essential for the long-term success of an organization.^[38] In the present study, six areas and 171 research topics were determined and prioritized based on the strategic plan of the dental hospital for the development of health-oriented dentistry, as well as the macro-organizational, supraorganizational, and national orientations. The strength of the present study is to assess the needs and provide the long-term solutions for the existing issues or new functional needs and solve the problems that affect the core processes of product development and service delivery.

Various approaches are used to assess the needs. Although these approaches vary and different methods are used to obtain the necessary information in each approach, it is important that the methods should appropriately be selected. Shirinbak *et al.*,^[5] Ajjawi *et al.*,^[26] Bahadori *et al.*,^[10] Kolahi *et al.*,^[18] and Malekafzali *et al.*^[39] determined the research priorities of different fields and organizations through applying different methods. Considering the recommendations in recent studies for the use of hybrid approaches and the great use of them in recent years, in the current study also, a hybrid approach was used for needs assessment and prioritization of the required researches based on the studied dental hospital's vision and objectives.

Priority setting is an important process in the management of health researches in the countries, whose importance will be double when financial and human resources are limited. One of the important reasons for priority setting is that it is known as a resource allocation method. What is currently visible in many organizations is the complexity and difficulty of decision-making in the

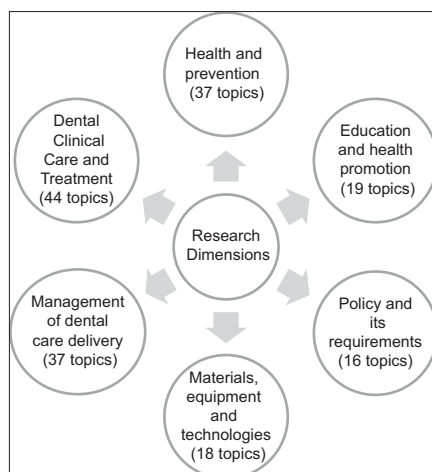


Figure 1: The research areas and topics obtained

Table 2: Technique for Order of Preference by Similarity to Ideal Solution ranks of the oral and dental health research topics in each studied dimension

Research Areas	Number topics (n)	Research titles	CL	Ranks
Dental clinical care and treatment	44	Reviewing the status of evidence-based dentistry (EBD)	0.715	1
		Study of the common dental clinical errors and their causes at the studied dental hospital	0.676	2
		Development of diagnostic and therapeutic procedures for the emergency dentistry	0.534	3
		Identifying the prevalence of common oral and dental infections in patients referred to the studied dental hospital	0.425	4
Health and prevention	37	Development of the protocols for the oral health and prevention of dental diseases in specific patients such as the diabetics, etc.	0.726	1
		Reviewing the effectiveness and efficiency of disinfectants in the environmental, equipment and supplies health at the studied dental hospital	0.652	2
		Evaluation of the infection control standards at the health-oriented dental hospital	0.587	3
		Development of preventive and oral health interventions for childhood	0.328	4
Education and health promotion	19	Study of the dentists' training and education effects on the oral health of patients referred to the studied dental hospital	0.716	1
		Vocational needs assessment of staff and dentists at the health-oriented dental hospital	0.654	2
		The pattern of dentist-patient relationship at the health-oriented dental hospital	0.574	3
		Development of lifestyle indexes related to the oral and dental health	0.286	4
Management of dental care delivery	37	Designing a comprehensive pattern for evaluating the satisfaction of dental care recipients	0.734	1
		Assessment of the patient's safety status at the studied dental hospital	0.572	2
		Study of the prime cost of health-oriented dental services	0.437	3
		Study of the dentists' practical experiences in meeting the needs of patients referred to the studied dental hospital	0.374	4
Policy and its requirements	16	Development of standards for evaluating and assessing the health-oriented dental hospital	0.665	1
		Assessment of the health-oriented dental services in terms of equity in health	0.589	2
		Development of the cost-sharing policies for oral and dental health services	0.476	3
		Development of a comprehensive primary care system for oral and dental health	0.295	4
Dentistry materials, equipment and technologies	18	The health technology assessment (HTA) study of using laser technology in dental treatments	0.705	1
		Evaluation of the effectiveness and efficiency of dental materials and equipment used in the studied dental hospital	0.524	2
		Feasibility study on preparing electronic oral and dental health records at the studied dental hospital	0.448	3
		Study of the use of stem cells in the root canal therapies	0.254	4

CL=Longitudinal coefficient

field of researches so that there is a growing pressure on research organizations to improve the efficiency and effectiveness of their research programs.^[11]

In the process of research needs assessment, after identifying research needs and setting priorities, a specific budget should be allocated to the research projects based on the certain criteria, the most important one of which can be the importance and role of researches in solving problems, aligning with goals, removing the concerns of interest groups and organizations, and cost-benefit analyses.^[29,40]

In the Akhavan Moghadam *et al.*'s study, some criteria such as time priority, applicability of the results, alignment with the organizational goals and objectives, feasibility, and helping to encourage the scientific development of medical faculties were used to prioritize the research topics.^[36] Furthermore, Bahadori *et al.* in their study used the criteria of time priority, applicability

of the results, alignment with the organizational goals and objectives, and feasibility.^[10] In the present study, first, the criteria for prioritizing were determined using literature review, the COHRED criteria framework, paying attention to the studied hospital's missions and goals, and the experts' opinions, and then, the ranking of research topics was done using the MADM model. In the Montibeller *et al.*'s study, the MADM has been mentioned as an effective tool for prioritizing research projects.^[41]

According to the results, in the dimension of dental clinical care and treatment, "Reviewing the status of evidence-based dentistry (EBD)" and "Study of the common dental clinical errors and their causes at the studied dental hospital" were the high priorities. The results of the Haghgoo and Rasouli's study (2016) showed that the how treatment was managed (41.7%) and the lowest percentage of complaints were about the dentist's diagnosis and treatment plan (2.9%),^[42] which were in accordance with the results of the present study,

in which the dental errors and their management was the second priority in the dimension of dental clinical care and treatment.

In the current study and considering the important role of health, prevention, and health promotion and according to the health-oriented approach of the studied hospital and upstream organizational policies in two areas of "health and prevention" and "health education and promotion," 53 research topics were determined and prioritized. The results of Akbari *et al.* study demonstrated that paying attention to the wide range of oral and dental care needs of the narcotic drug abusers and planning their dental treatment were essential.^[43] Based on the results of the present study, "Development of the protocols for the oral health and prevention of dental diseases in specific patients such as the diabetics, etc." in the dimension of health and prevention was the first priority.

"Study of the dentists' training and education effects on the oral health of patients referred to the studied dental hospital" and "Vocational needs assessment of staff and dentists at the health-oriented dental hospital" were two high priority research topics in the dimension of education and health promotion in the present study, which is similar to the results of the Lee *et al.*'s study.^[44] Some results of Mohebbi and Esfandiyar's study on the teaching and providing community dentistry courses for dental students confirm the results of the present study.^[45] However, the results of another study showed that the educational materials related to the oral and dental health had a low percentage of mass media content in Iran and did not cover all educational needs in this area.^[46]

The research needs assessment approach in the present study was to pay attention to the needs of the target population, and accordingly, "Designing a comprehensive pattern for evaluating the satisfaction of dental care recipients" in the dimension of management of dental care delivery has the highest priority, which is line with the results of the Daryazadeh *et al.* study.^[47]

Some results of the present study in the dimension of management of dental care delivery in the field of dentists' practical experiences are similar to the results of the Kopycka-Kedzierawski *et al.*' study.^[48] The results obtained in the dimension of dentistry materials, equipment and technologies are consistent with those of the Dziedzic *et al.*'s study.^[49] In this dimension, one of the high priority topics was "Study of the use of stem cells in the root canal therapies," which was similar to the results of the Miran *et al.*' study.^[50]

Conclusion

Research needs assessment is the key point and the beginning of the research management process. Determining research priorities plays an important role in preventing waste of resources and conducting researches based on the real needs. The research topics prioritized in the present study, based on the studied hospital's strategic goals and policies, can meet the mission of service development and can be dynamic to fulfill the health-oriented dental missions. Finally, it can be recommended that the research resources should be allocated according to such priorities so that the studied hospital has the highest dynamic performance in achieving its goals and objectives.

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Conflicts of interest

There are no conflicts of interest.

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