

Oral health information system in Iran: domains and priorities, using Nominal Group Technique

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Abstract: Objectives: The aim of this study was to identify the domains and their priorities for the Oral Health Information System (OHIS) at Ministry of Health and Medical Education (MOH) in Iran. Method: Using Nominal Group Technique (NGT) with strategic sampling, informants' consensus was developed on selection of main domains by combining few sub domains in June 2012. The participants were also requested to determine the importance of each domain. Results: The informants determined 6 main domains as following: "dental workforce", "Oral health care provision centers", "Oral health care provision", "Covered population demography", "Oral health budgeting and expenditure", and "Oral health indicators". Regarding the current status of gathering data at MOH in Iran, experts believed "Oral health budget and expenditure" was the first priority and "oral health care provision" was the last one. Conclusion: According to participants' opinions, OHIS at MOH in Iran faces incomplete data gathering challenges. To reach the comprehensive data set in OHIS, oral health system has to attempt to cover the six main domains.

Key words: Information system; Oral health; Nominal group technique

1. Introduction

The need for current and reliable information in these recent centuries, which is called the era of "explosion of information", is even greater than before. Information is currently considered as one of the most important resource for decision making in any organization and society (Kadiri and Adetoro, 2012; Adeoti-Adekeye, 1997). The information can determine priorities, help with reorganization of society's health care needs and demands, and facilitates organizational management and control (Adeoti-Adekeye, 1997).

Appropriate information is essential for improving oral health care efficiency (Martínez et al., 2005). Health-related information can provide valuable population-based health profile that, in turn is used to improve and promote community's overall health (WHO, 2014). In public health, smart decision making, policy development, effective problem solving and appropriate budget allocation is basically related to availability of reliable information. However, there are still many countries that struggle due to deficiencies in their health

information systems (Abou Zahr and Boerma, 2005; Littlejohns et al., 2003).

Therefore, to improve oral health as part of overall health system, gathering predetermined information, is crucial. Yet establishing proper oral health information system is one of the declared WHO priority action areas (Petersen, 2008; Petersen, 2007; Petersen, 2005).

The Ministry of Health and Medical Education (MOH) in Iran has adopted a health care network that is based on Primary Health Care (PHC) system. Three levels of services are defined for PHC in Iran. Since 1996 oral health care has been officially integrated into the national PHC network and oral health services provided in the first and second level including preventive oral health care and restorative dental treatments (Oral Health Bureau, 2012). At present data on oral health services are generated at village, district and provincial levels. The information is then transferred to national level, at the MOH for further processing and analyses in order to prepare the reports on national level data. Although there is a basic Oral Health Information System (OHIS) available, it is not comprehensive

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enough for future needs according to the newly developed national policies and strategic plans. Therefore, it is necessary to design an OHIS that could cover all interested relevant domains. This study was designed to identify oral health information system domains and priorities at MOH of Iran in order to determine priority interventions.

2. Methods

In this study, mixed method - (qualitative and quantitative approaches) was conducted. To generate information in response to domains of Oral Health Information System (OHIS) in Iran and develop consensus about their priorities through group discussion, Nominal Group Technique (NGT) was used. The NGT has several advantages over other group decision making processes such as highly structured process, generating a large number of ideas and measuring the relative importance of ideas generated (Bikmoradi et al., 2008). In June 2012, the preliminary session was held in Tehran at the MOH attended by a number of oral health experts, having official positions in dental public health nationwide.

Participants were selected by consultation with the Oral Health Bureau of Ministry of Health and Medical Education through strategic sampling. The topic of the discussion, the aim and importance of the study were included in the invitation letter, in order to increase participants' interest for active participation and discussion. Initially 20 persons at different levels of oral health expertise were invited. Only 14 were interested in participation in the session.

The NGT session took two hours, and it was managed by a facilitator. For fast and smooth processing of session, outline of the discussion, the brief explanation and the question for the NGT session were delivered to participants at the beginning of the meeting. The question to participants was: "Currently, what data are necessary for improvement of the oral health information system in Iran?".

At this step, the participants were requested to write down their opinions based on their knowledge and experience independently in 15 minutes time limited. In the next step, the facilitator requested each person to take turn and share their opinions without any discussion between the participants. All the responses were recorded on board by a secretary.

Further discussion and clarification for ambiguous items were expressed by informants in

the next step. All suggested statements were listed and consensus was developed on classification of those statements. Eventually, informants reached the final agreement on domains of oral health information system as part of the dental public health priority in Iran.

In the final step, oral health experts were requested to determine the importance of each domain considering prioritization of data. The answers were given on a five grade Likert scale ranging from "highest" (score 5) to "lowest importance" (score 1). The scores of each domain were summed up in order to provide the importance of domain indicator.

2.1. Analysis

In this study, to analyze the data of the NGT session, a combination of quantitative and qualitative methods was conducted. In qualitative method, content analysis of data was conducted by a combination of condensing, and categorizing the structure for exploring the oral health experts' opinions about domains to be considered for oral health information system in Iran. To confirm the information elicited in the NGT session, inductive content analysis of data was used. In quantitative analysis, to identify the priorities, Scoring and ranking methods was used (Bikmoradi et al., 2008; Halai, 2006).

3. Ethical considerations

This study was conducted as partial requirement of a PhD dissertation research project. The purpose of this study was clearly defined for the participants. Also it was made clear to all invited informants that, their participation in the NGT session was on the voluntary basis (Orb et al., 2001; Punch, 1994). Besides, the informants were also ensured that their opinions and statements will be identified and kept confidential by study investigators.

4. Results

Out of 20 invited participants, 14 attended. The group consisted of nine oral health experts, two dentists employed by health centers and three "Behvarz" (community health workers stationed in rural health houses, providing primary oral health care to village population) (Table 1).

Table 1: Characteristic of participants of the NGT session held in June 2012 to identify domains of oral health information system at Ministry of Health and Medical Education in Iran and their priorities

Characteristic	Frequency (%)
Age	
20-30	2(14)
30-40	3(21)
40-50	8(58)
50-60	1(7)

Gender	
Female	6(43)
Male	8(57)
Job experiences*	
0-10	4(29)
10-20	6(50)
20-30	4(21)
Position	
Oral health experts	9(64)
Dentists	2(14)
Behvarzes**	3(21)

* number of years of working experiences

**community health workers stationed in rural health houses, providing primary oral health care to village population.

The NGT session proposed six domains and 19 sub domains as shown in Table 2.

Table 2: Domains and sub domains of oral health information system at Ministry of Health and Medical Education in Iran extracted from NGT session held in June 2012

<ul style="list-style-type: none"> Dental workforce <ul style="list-style-type: none"> Characteristic and distribution of dental workforces and related health workforce Topics and hours of Continuous Medical education (CME) Productivity of dental workforce 	<ul style="list-style-type: none"> Covered population demography <ul style="list-style-type: none"> Number of total covered population Number of target population
<ul style="list-style-type: none"> Oral health care provision centers <ul style="list-style-type: none"> Total number, number of active centers <ul style="list-style-type: none"> Dental equipment counts Number of Inactive days of centers Educational material counts 	<ul style="list-style-type: none"> Oral health Budgeting and expenditure <ul style="list-style-type: none"> Budget <ul style="list-style-type: none"> Expenditures Oral health care provision center income
<ul style="list-style-type: none"> Oral health care provision <ul style="list-style-type: none"> Number of oral care provided for target population Oral health service coverage number of referred cases to health centers utilization of oral health services 	<ul style="list-style-type: none"> Oral health indicators <ul style="list-style-type: none"> Input indicators Process indicators Output, outcome and impact indicators

Table 3 demonstrates that, majority of informants indicated the "Oral health budgeting and expenditure" as well as the "Oral health indicators" had the highest priority and importance. Although,

half of them pointed out that "Oral health care provision" was the lowest priority and importance domain.

Table 3: The frequency and total importance score of domains of oral health information system at Ministry of Health and Medical Education in Iran elicited from NGT session held in June 2012 (N=14)

	highest importance (5)	high importance (4)	Importance (3)	low importance (2)	lowest importance (1)	Total score
Oral health budgeting and expenditure	8	5	0	1	0	62
Oral health indicators	8	2	2	1	1	57
Oral health care provision centers	6	5	1	1	1	56
Covered population demography	8	0	4	1	1	55
Dental workforce	6	2	3	1	2	51
Oral health care provision	6	1	0	3	4	44

5. Discussion

Nominal group technique as a time efficient and cost effective procedure is mentioned to facilitate decision making through problems identifying,

solutions finding and prioritizing (Potter et al., 2004). In this study, Nominal Group Technique (NGT) method was used to determine and prioritize the data that should be gathered for OHIS in Iran. According to the informants' experiences the

suggested data was categorized into six domains. The extracted domains were in compliance with Health Information System (HIS) framework reported by World Health Organization (WHO) and Human Metric Network (HMN) (WHO, 2014).

WHO-HMN guideline contains three subdivisions and six components which are all required for a strong health information system. The subdivisions contain "inputs", "processes" and "outputs". "Inputs" include the needed resources for HIS and "processes" refers to how data is gathered, managed and how data sources are selected. The "outputs" subdivision is about the information production, dissemination and usage. Among the six components of HIS, three are related to "processes" category comprised of: "indicators", "data sources" and "data management". Findings of this study are comparable with the "indicators" component of "processes" category of WHO-HMN framework on health information system (WHO, 2014).

A strong HIS for collecting the essential data is fundamental for effective and better decision making. According to informants' opinion, collecting the data on dental workforce, oral health care centers, covered populations demographics, oral health care provision, oral health indices, and oral health budgeting and expenditure are needed for an effective oral health information system at the national level. These findings are partly in agreement with the study of Peterson et al., who described the important elements of oral health information system including oral health status, risk factor surveillance, quality and outcome, care and intervention and administration of care (Petersen, 2005). Comprehensive collection of data is necessary for monitoring trends of oral diseases and evaluation of oral health projects at country, regional and global levels, with special focus on the importance and necessity of such of the compilation of such information (Petersen, 2005).

The data generated by an oral health information system should be able to get queries in different categories such as epidemiological surveillance, coverage of the population by oral health services, oral health service recording, reporting, management of resources and administrations, quality of care, monitoring of oral health program, and outcome evaluation (Petersen, 2008).

The current oral health data gathering condition at MOH is not comprehensive enough. It seems limited resources and incomplete data in some domains can so far be the main concerns. In this study "oral health budgeting and expenditure" domain was the first priority. So far, there has been no formal and regular collection of data in this field. Implementation of oral health interventions with effective results depends mainly on financing management through gathering financial data (Lu et al., 2010).

Given that, a surveillance system means continuous gathering, analyzing and reporting data for better planning, implementation and evaluation of different programs, WHO has developed some

indices to assess a surveillance system (Teutsch, 2000; Buehler et al., 2004). As a second priority, core oral health indicators should be collected regularly to assess oral health conditions, monitor, and evaluate the programs.

In Iran, similar to some East-European Countries, the current method of data collection has been limited to the number and types of oral health services provided in rural and urban health centers (Petersen, 2005). Currently these data has been gathered with some deficiencies which resulted in selecting the "oral health care provision" as the last priority.

One limitation of this study is difficult accessibility to all invited informants and we do not determine whether they reach the same consensus as well. Since the variety of different set of informants was participated in NGT session and data saturation were occurred, we can be mostly convinced that the informants represented variety of the oral health experts.

6. Conclusion

The existence of a comprehensive oral health information system is the most imperative factor for better planning, implementing and evaluating of any intervention conducted at the national level. According to participants' opinion, oral health information system at the Ministry of Health and Medical Education in Iran should cover the six main domains to collect the necessary data in which "Budgeting and expenditure" domain determined as the most important and first priority.

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