

Developing a policy guidance for financing dental care in Iran using the RAND Appropriateness Method

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Objective: This study aimed to provide recommendations on health care financing with special emphasis on dental care. **Methods:** The RAND Appropriateness Method was employed to obtain the collective opinion of a multidisciplinary panel of experts on a set of recommendation statements regarding Iranian dental care financing. An initial set of recommendations were identified from a literature review. Panel members, selected purposively and by peer nomination, each rated the *appropriateness* and *necessity* of the recommendations in a structured process of two rounds. Each recommendation was classified as inappropriate, uncertain, appropriate but not necessary, or appropriate and necessary according to the median rating score and the level of disagreement among the panellists. **Results:** Of 28 initial recommendations, 25 were agreed on as *appropriate*, of which 22 were considered as *necessary*. Altogether, these recommendations provide a holistic picture of an oral health system's financing in three domains: revenue collection, pooling of revenues and purchasing of dental services. **Conclusion:** The policy guidance recommendations are intended to provide the Iranian oral health authorities with an evidence-base for financing dental care. The recommendations may be transferrable, at least in part, particularly to developing countries with similar hybrid health system structures. Finally, the method used to develop the recommendations can serve as a model for use elsewhere.

Key words: dental care; health policy; health care financing administration, dental insurance, health planning

Introduction

Health care is organised through various systems around the world that may to some extent explain the differences in health outcomes among populations. Thus, identifying those system characteristics contributing to better outcomes may help a health sector reform via better informed choices and thereby help to develop a more efficient and equitable health system. This idea was probably first proposed by Cochrane (1972) who highlighted that the health systems should be regularly scrutinised for effectiveness and efficiency to reduce wasted effort and resources.

The worldwide variation in oral health care systems (OHCSs) is well documented (Anderson *et al.*, 1998; Ingle and Blair, 1978; Widström and Eaton, 2004; Yule, 1988). The financing arrangements for OHCSs have changed over the years but it has been noted that, at the system level, these changes often lack an evidence base (Whelton, 2004).

Assuming that patients choose to receive healthcare, any system should have characteristics to encourage them to utilise appropriate services (Daly *et al.*, 2002). The financing arrangements of an OHCS play an important role in determining access to services. The characteristics of the financing system affect both the quality and quantity of care provided (Gift *et al.*, 1990).

Oral health policies should address the difficulties in financing and provision of oral health care worldwide.

Specifically, rapid increase in expenditures, failures in coverage and access to services, and concerns about the efficiency of care provision are among the most common and important challenges faced by OHCSs around the world (Whelton, 2004) demanding changes in systems design, particularly with regard to financing. Since it is difficult for dentistry to compete with other health areas for a greater share of limited public resources (Bailit and Beazoglou, 2008), all available policy tools should be employed to optimise the performance of OHCSs despite the scarcity of resources.

Unfortunately, oral health policymakers often seem to base their decisions more on the conventional wisdom than on up-to-date scientific evidence (Baelum *et al.*, 2007). This may cause major problems when making crucial decisions, like those regarding system design. Even if policymakers seek evidence to inform decision-making they may not find such in the literature covering the financing of OHCSs. This shortcoming motivated us to conduct a study to provide recommendations concerning oral healthcare financing to help the Iranian oral health authorities in developing informed policies, and to identify the areas of high priority when considering reform options.

With an increasing number of dentists and dental specialists (currently about 25,000 active ones, corresponding to a national average dentist:population ratio of about 1:3,000), national oral health surveys have revealed high levels of unmet need (Hessari, 2009), while about 90%

of dental costs are being met directly by patients or their families (Hosseinpour *et al.*, 2010). These findings together imply an urgent need for appropriate interventions.

Iran is a middle-income developing country with a hybrid healthcare system. Its tax-financed integrated primary health care network, including oral health care, is directed by the Ministry of Health and Medical Education (MOH). A mainly preventive package of oral health services is delivered free to the target groups (under 12 year-olds and pregnant or lactating women) through a network of about 2,000 currently active rural and urban health centres. Social insurance is a prominent feature of Iran's health system offering a very basic benefit package of dental services to about 90% of the population. This coverage has been described and critiqued in detail with emphasis on dental care (Jadidfard *et al.*, 2012). Commercial insurance plays an increasing role in financing Iranian's healthcare and is supplemental to the above social insurance scheme.

Although many healthcare systems around the world are experiencing reform to address their particular situations and challenges, most of these reforms have in common a number of generic interventions that could be safely replicated in other settings and countries. Periods of reform provide opportunities for implementing organisational change in oral health services.

Despite progress made during recent decades in Iran, health financing structures lack a coherent strategy after piecemeal development has resulted in its current rather confusing composition. With the 2011 implementation of the fifth 5-year national development plan, healthcare financing in Iran may experience a transitional period. In such an environment, using a structured process for obtaining experts' collective opinion, this study aimed to produce evidence-based policy guidance to inform the decision-making regarding financing Iran's dental care.

Method

The RAND Appropriateness Method (RAM) was used to obtain the collective opinion of a panel of experts for a set of recommendations concerning dental care finance in Iran. According to the World Health Organization (WHO) definition, healthcare financing, as one of the main functions of health systems, consists of three consecutive sub-functions: revenue collection, pooling of revenues and purchasing (paying for) services (WHO,

2000). Our conceptual framework for healthcare financing depicts the flow of funds from sources to the care providers (Figure 1).

First, a literature review was conducted to compile the evidence or recommendations indicating appropriate characteristics of oral healthcare financing that would potentially result in improved system performance. The gathered materials were then reworded into the form of recommendation statements by the research team (the authors). Emphasis was placed on guidance which was repeated in countries across the ideological spectrum, which not only mirrors the hybrid nature of Iranian healthcare system but could increase the transferability of the study's results. This first stage took about six months.

Eleven individuals were identified purposively and via peer nomination to constitute the expert panel. Table 1 shows the panel's composition in terms of specialties and professional affiliations of the experts who returned the first round forms. Five files were sent to the participants after obtaining their consent to participate in the study:

1. A form on which to rate the appropriateness of each recommendation statement;
2. A summary of the study and its background, importance and method;
3. A guide to completing the form. Since the aim of the first round was to obtain only the appropriateness ratings for the recommendations, the panellists

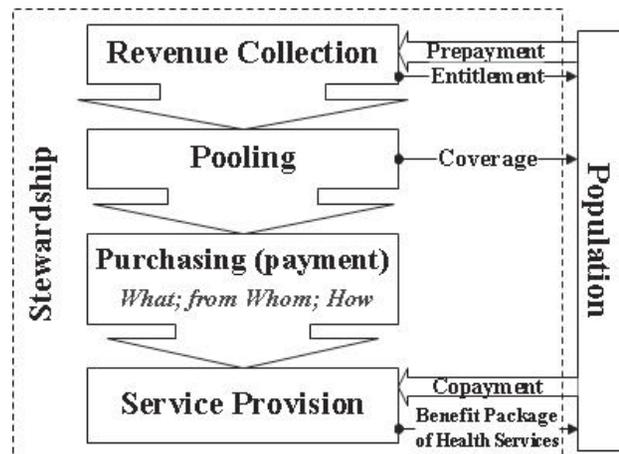


Figure 1. Conceptual framework for healthcare financing system (adapted from Kutzin, 2001; WHO, 2000)

Table 1. Panel composition: specialties and professional affiliations of the participating panel of experts

Specialty	Professional affiliation
1 Health services management	Community oral health department of a dental school
2 General Medicine, Health Financing	Medical Services Insurance Organisation
3 General Medicine, Health Financing	Social Security Organisation
4 General Medicine, Health Financing	A commercial insurance company
5 Dental specialist in oral disease diagnosis	Ministry of Cooperatives, Labour and Social Welfare
6 Health economics	Social Security Organisation
7 Public health	Health Policy Council, Ministry of Health and Medical Education
8 Dental public health	Oral Health Director, Ministry of Health and Medical Education
9 Dental public health and Orthodontics	Educational director of a Dental School
10 Health policy	Educational development centre of a medical university

were provided with explanations for the concepts of *appropriateness* and *necessity* (based on the RAM definitions) to help distinguish between these two while rating. An *appropriate* recommendation was one that is potentially results in improving system performance or is an indicator of desired performance. Whereas, *necessity* is a more stringent criterion referring to recommendations that *must* be undertaken to achieve clear performance improvements in the system. Rating a recommendation as a highly necessary one would imply urgency and priority of implementation. Thus, all the following four criteria (Kahan *et al.*, 1994) must have been met for a recommendation to be considered as *necessary*:

- The recommendation is appropriate (a prerequisite),
 - It is improper not to fulfil the recommendation,
 - There is a reasonable chance that it will improve system performance,
 - The magnitude of the expected performance improvement is not small;
4. The definitions and explanations of some terms used in recommendation statements to harmonise perspectives and achieve greater convergence among raters;
 5. A list of the main reviewed documents which played role in developing the recommendations.

In the first round, each participant was asked to rate the appropriateness for each of the recommendation statements on a scale of 1-9, considering the contrast between the concepts of appropriateness and necessity as explained. Each recommendation statement was classified as appropriate, uncertain or inappropriate for the system taking into account the panellists' median rating score and their level of inter-rater agreement. Thus, recommendations with panel median rating of 7-9 without disagreement were classified as appropriate; those with median score of 1-3 without disagreement were classified as inappropriate; and those with panel median of 4-6 or any median with disagreement were classified as uncertain.

Disagreement was assessed according to the approach of the European Union BIOMED Concerted Action on Appropriateness (Fitch *et al.*, 2001) which, for a panel size of 8-10, considers disagreement exists where at least three of the panellists rate the recommendation in each extreme (1-3 and 7-9).

The second round meeting was held about 10 days after the initial forms were returned. The main researcher (MPJ) acted as the moderator. Each panelist received an individualised document showing the distribution of all the experts' first-round appropriateness ratings, together with their own specific ratings (Figure 2). During the session, panellists discussed the ratings, focusing on the areas of disagreement or uncertainty as determined by the main researchers, and were given the opportunity to modify the initial recommendation statements, if desired. Some evidence was presented regarding the issues under discussion. No attempt was made to force the panel towards consensus. Afterwards, they individually re-rated the recommendation statements discussed, regardless of their earlier ratings.

Finally, the list of all the recommendation statements sorted as appropriate was prepared and panellists were asked to rate the *necessity* of these recommendations, similarly on a scale of 1 to 9. Then only *appropriate* recommendations with a *necessity* rating of 7 or more and without disagreement were judged *necessary*; otherwise they were identified as *appropriate but not necessary*.

Results

Some 28 initial recommendations for financing Iranian oral healthcare were identified through a review of the relevant literature. Of the 11 experts who initially agreed to participate in the study, ten returned completed forms in the first round and eight of these experts attended the second round meeting.

After the first round of *appropriateness* ratings, 7 recommendations were identified by the research team for discussion in the second round (numbered in Table 2 as 7, 14, 17, 21, 22, 25 and 26). Of the 28 initial recommendation statements, 25 were agreed on as *appropriate* and of those, 22 were considered *necessary* by the expert panel. Table 2 presents the recommendation statements together with the median of *appropriateness* and *necessity* ratings, and the levels of agreement for *appropriateness* ratings at the end of the second round.

Discussion

The RAM is recognised as the only systematic method that combines the collective opinion of experts with existing evidence (Campbell *et al.*, 2003). It has been evolved primarily to develop clinical practice guidelines. The RAM does not aim to obtain the experts' consensus but to assess their level of agreement. Basically, RAM is a modified Delphi method that, unlike the original Delphi, gets the participants to re-rate items after having had the chance to discuss their first round ratings in a face-to-face meeting, similar to the Nominal Group Technique (NGT) and Consensus Development Conferences (Fitch *et al.*, 2001). So, the RAM incorporates the characteristics of both NGT and the Delphi method (Campbell *et al.*, 2003).

Regarding the panel composition, the use of multi-disciplinary panels is strongly recommended to better reflect the opinions of the variety of specialties involved in decision-making and get more realistic rates (Kahan *et al.*, 1995). Our panel included participants from the main Iranian institutions involved in healthcare financing. Though they were not the official representatives of their institutions, it is reasonable to expect that their opinions implicitly reflect the views of their respective institutions. This approach might help identify pragmatic policies and form the basis of collaborative partnerships between the relevant institutions.

Disagreement has been defined in various ways during the RAM history but is essentially the lack of consensus arising from either widely dispersed panel ratings or group polarisation (Fitch *et al.*, 2001). In this regard, we chose a classic approach as explained in the methodology section. This was an arbitrary choice with the number of recommendation statements under consideration seeming to be manageable. Such an approach will be biased for

	Extremely inappropriate	→	Uncertain	→	Extremely appropriate	Median				
			1	2	6					
R01	1	2	3	4	5	6	7	8	<u>9</u>	9
R02			1		1			3	4	
R02	1	2	3	4	5	6	7	<u>8</u>	9	8
R03			1				1	7		
R03	1	2	3	4	5	6	7	<u>8</u>	9	9
R04					2		2	3		
R04	1	2	3	4	5	6	7	<u>8</u>	9	8
R05			1				4	4		
R05	1	2	3	4	5	6	7	<u>8</u>	9	8
R06			1	1	2	1	1	3		
R06	1	2	3	4	5	6	7	<u>8</u>	9	7
R07	1		1	1	4	1		1		
R07	1	2	3	4	5	6	7	<u>8</u>	9	5
R08					3	2	4			
R08	1	2	3	4	5	6	7	<u>8</u>	9	8
R09			1	1	3	2	2			
R09	1	2	3	4	5	6	7	<u>8</u>	9	7
R10			2	2			3	2		
R10	1	2	3	4	5	6	7	<u>8</u>	9	8
R11			1	2	2	1	3			
R11	1	2	3	4	5	6	7	<u>8</u>	9	7
R12			1	5	1	2				
R12	1	2	3	4	5	6	<u>7</u>	8	9	7
R13			2	1	2	4				
R13	1	2	3	4	5	6	7	<u>8</u>	9	8
R14	1		1		4	1	1	1		
R14	1	2	3	4	5	6	7	<u>8</u>	9	6
R15			1				1	4	3	
R15	1	2	3	4	5	6	7	<u>8</u>	9	8
R16					1	1	1	3	3	
R16	1	2	3	4	5	6	7	<u>8</u>	9	8
R17	1		1		3		1	1	2	
R17	1	2	3	4	5	6	7	<u>8</u>	9	5
R18					3	1	1	2	2	
R18	1	2	3	4	5	6	<u>7</u>	8	9	7
R19					2	2	2	3		
R19	1	2	3	4	5	6	7	<u>8</u>	9	8
R20			2	1	3	1	2			
R20	1	2	3	4	5	6	<u>7</u>	8	9	7
R21			1	1	3	1	3			
R21	1	2	3	4	5	6	7	<u>8</u>	9	6
R22	1				4		1	2	1	
R22	1	2	3	4	5	6	7	<u>8</u>	9	5
R23			1	1	1	1	2		3	
R23	1	2	3	4	5	6	<u>7</u>	8	9	7
R24					1	1	3	1	3	
R24	1	2	3	4	5	6	<u>7</u>	8	9	7
R25	1		1		4	1	1	1		
R25	1	2	3	4	5	<u>6</u>	7	8	9	5
R26	1				2	2	2	2		
R26	1	2	3	4	5	<u>6</u>	7	8	9	6
R27					1		4	2	2	
R27	1	2	3	4	5	6	7	<u>8</u>	9	7
R28					1		2	4	2	
R28	1	2	3	4	5	6	7	<u>8</u>	9	8

Note: This document was unique for each panellist and shows the distribution of ratings for each recommendation, together with the panellist's own response (underscored). For the recommendation R01, one panellist rated the recommendation 7, two rated it 8 and six, 9 (extremely appropriate). This particular panellist rated it 9.

Figure 2. Example of an individualised panellist's rating sheet for one of the panel members

panels that are not multiples of three, producing less disagreement for smaller panels (like ours) and vice versa (Fitch *et al.*, 2001). In our case, a review of ratings for each item did not reveal the possibility for such bias in detecting the areas of disagreement.

Generally, discussions focus on the areas of disagreement to explore whether there is real disagreement among panellists or not (Fitch *et al.*, 2001). We decided to include for further discussion those areas of uncertainty over *appropriateness* with more emphasis placed on possible oral health implications.

Use of individual *Personalised Panellist Rating Sheets* (Figure 2) permits each panellist to discuss their rating in the context of all the others' anonymised ratings (Fitch *et al.*, 2001) and formed a good basis for the face-to-face discussion.

The basis of RAM is a literature review of the subject, ideally a systematic one (Fitch *et al.*, 2001). Time limit for this study and the wide range of issues concerning healthcare financing did not allow this approach to be adopted. Instead, an extensive review of relevant literature was conducted.

Turning to the results, though many of the appropriate characteristics of a successful health system have been identified, they are not evident in the policies adopted by governments particularly in developing countries. The recommendations provided as the results of this study, should be viewed as our best current effort in an evolving field rather than a definitive list. Altogether, these recommendations provide a holistic picture of oral health system across three domains of healthcare financing according to our conceptual framework, namely, revenue collection, pooling and purchasing of dental services. Most of our expert panel members were experienced in healthcare financing and quite familiar with the current shortcomings of the Iranian health system. This may explain the high ratings given to the statements that were primarily developed to address those failures.

As a subsystem for the general health system, OHCS shares many of the structural characteristics and challenges of health care in general. Although some papers (as cited in the introduction) describe healthcare systems in different countries with emphasis on dental care, it seems that the dental literature is not rich on the techni-

Table 2. Final median scores of appropriateness and necessity ratings and agreement level for recommendation statements regarding financing dental care in Iran

<i>Recommendation statements*</i>	<i>MAS</i> [†]	<i>AL</i> [‡]	<i>MNS</i> [§]
1 MOH must establish a specialised institution to make policies regarding healthcare financing and health insurance considering the national priorities, constraints and circumstances	9	+	8
2 MOH must accurately prepare and annually report the National Health Accounts (including the dental sector) according to standard formats	8	+	8
3 At least 70% of health system revenues must come from general revenues and social insurance premiums	9	+	8
4 Out-of-pocket payments must not exceed 40% of total dental expenditures	8	+	7.5
5 All people must be covered for basic health insurance including a benefit package of dental services	8	+	8.5
6 Each individual must be covered only by one basic health insurance fund	7	±	7.5
<u>7</u> Each health insurance fund must at least cover 500,000 people	6.5	±	-
8 Social health insurance premiums must be progressive and be revised at regular intervals	8	+	7.5
9 MOH must encourage integration of small and fragmented risk pools and development of the largest possible pools at the national level	7	+	8
10 Health insurance funds must not get involved in direct service provision	8	±	7.5
11 MOH must establish a specialised institution to periodically determine the basic benefit package of health services	7	±	8.5
12 Defining the basic benefit package of health services must be based on their relative cost-effectiveness, their cost burden for households, existence of demand for them in health market and the socio-economic status of the potential consumers	7	+	8
13 Basic benefit package of health services must be the same under different funds	8	+	8
<u>14</u> Basic health insurance funds must cover supplementary services considering the specific local health needs	7.5	±	6.5
15 A unitary pool at the national level must cover the health (including dental) expenditures for patients suffering from special high-cost general diseases	8	+	7.5
16 Contracting process and purchasing health services must be based on the universal health information system and evaluation of providers' performance	8	+	7.5
<u>17</u> Receipt of services within the basic benefit package must not require patients' co-payment	3.5	±	-
18 Differential co-payment rates must be set for covered dental services based on the contribution of each service in oral health promotion and the individuals' responsibility for treatment prognosis	7	±	7.5
19 To improve the deprived groups' access to health services, exemptions must be considered to their health payments	8	+	8
20 A mixed payment method (fee-for-service as well as capitation [#]) must be introduced to generate appropriate incentives to oral health care providers mainly in terms of quality assurance and cost containment concerns	7	±	8
<u>21</u> Payment method for primary [oral] health care must include a capitation component	8	+	8
<u>22</u> MOH must set local tariffs for all health services in cooperation with all stakeholders	7.5	+	8
23 The tariffs of [oral] health services must reflect the service time, physical and mental effort and psychological stress of providers	7	±	6.5
24 National priorities and circumstances, including evidence-based clinical practice guidelines, the preferred provider of services and interdisciplinary income equity must be taken into consideration when setting local tariffs for health services	7	+	7
<u>25</u> Private tariffs must not exceed 200% of public tariffs	6	±	-
<u>26</u> Private (commercial) insurance premiums must be based on "community-rating" [#] rather than individuals' characteristics such as age or health status	7	±	6.5
27 Services covered by private (commercial) insurance companies must be supplemental to those of social insurance scheme	7	+	8.5
28 Excise taxes must be levied on goods and services detrimental to oral health and the resulting resources must be proportionately allocated to oral health promotion interventions	8	+	8

* After modifications made following the first round feedbacks and during the meeting discussion. Note the order of the recommendations approximately approximates to the flow of funding in the framework depicted in Figure 1.

[†] MAS: Median Appropriateness Score on the scale: 1, extremely inappropriate, 5, uncertain, 9, extremely appropriate.

[‡] AL: Level of Agreement: +, agreement;
-, disagreement;
±, indeterminate.

Note there were no recommendations over which there was disagreement as defined in the method.

[§] MNS: Median Necessity Score on the scale: 1, clearly not necessary; 5, might be necessary; 9, clearly necessary.

 Items identified for discussion at the meeting have underscored numbers on the left.

[#] Definitions and/or explanations for the terms marked # were provided to the raters.

A *round to the middle* strategy has been adopted to treat decimal medians that fall exactly between the 3-point boundaries, that is, medians of 3.5 and 6.5 would be assigned to the uncertain category (3.5→4 and 6.5→6).

cal characteristics of delivery systems and there are few rigorous studies that explore causal relationships between a particular mode of financing oral health services and change in any desired outcome such as efficiency of care delivery or oral health status of the population served. This may be due to the numerous known and unknown confounders that complicate such studies.

When, in some areas, the research team did not find convincing evidence suggesting an effective solution to achieve the best performance, we stated the recommendation in a more general way. New evidence produced through on-going and future studies should illuminate these aspects of financing dental care. Specifically, with regard to payment mechanisms (that perhaps form the greatest part of dental literature regarding financing systems) we did not find evidence pointing to a scheme that in addition to keeping down the costs of the system, encouraged both patients and providers to adopt an appropriate rate and pattern of service utilisation that, while meeting patients' needs, would promote the oral health of the population. Although, there are a lot of schemes undertaken by, for example, insurance companies, these experiences have mainly been made with the primary concern of cost containment. Meanwhile, a few studies (Bailit *et al.*, 1985; Coventry *et al.*, 1989; Zickert *et al.*, 2000) have shown the importance of some strategies in payment mechanisms for oral health services. The results of these studies are reflected in some of the recommendation statements.

The conceptual framework adopted for the study originates from The World Health Report 2000 (WHO, 2000). At first sight, it includes elements beyond the common boundaries of oral health, but the researchers believed that such a comprehensive framework allows consideration of oral health issues in the context of the overall healthcare financing system. As a result of adopting this framework, many of our recommendations go beyond the direct control of oral health authorities. It has been discussed that any source of inefficiency in resource allocation at the whole system level means a waste of resources that might otherwise be used by the health sector to move towards a more universal coverage (WHO, 2010). The marginal position of oral health compared to other health areas, especially when allocating limited public resources, makes the process of financing dental care (through public prepayment or insurance schemes) very sensitive to fluctuations in available resources. Thus, the issues of efficiency and equity of the whole system are of particular importance to the dental sector and oral health (Jadidfarid *et al.*, 2012). Accordingly, this package of recommendations implies that, in some areas, the role of oral health authorities would be advocacy of reforms or interventions at the overall health system level or beyond, rather than undertaking insufficient downstream actions independent of the overall context, which may result in wasting limited available resources. In the long term, the dental sector would benefit from such fundamental changes. In other words, some of these recommendations imply the inadequacy of interventions aimed at addressing specific problems at the OHCS level without adequate attention to the wider context of the overall health system; e.g. tackling inequity utilisation of oral health services within a poorly-regulated and fragmented

health system with different subgroups of society being covered by numerous funds offering different benefits to them, when it is that very system which may account for much of the inequity. In such an environment, addressing failures while ignoring deficiencies in the overall system may not be justifiable.

Conclusion

The set of policy guidance recommendations developed by this study are the outcome of an initial effort to provide the Iranian oral health authorities with an evidence-base for financing dental care. The recommendations may be transferrable, at least in part, particularly to developing countries with similar hybrid health system structures. Finally, the method used to develop context-specific recommendations can serve as a model for use elsewhere.

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References

- Anderson, R., Treasure, E.T. and Whitehouse, N.H. (1998): Oral health systems in Europe Part II: finance and entitlement to care. *Community Dental Health* **15**, 145-149.
- Baelum, V., Helderma, W.V.P., Hugoson, A., Yee, R. and Fejerskov, O. (2007): A global perspective on changes in the burden of caries and periodontitis: implications for dentistry. *Journal of Oral Rehabilitation* **34**, 872-906.
- Bailit, H. and Beazoglou, T. (2008): Financing dental care: trends in public and private expenditures for dental services. *Dental Clinics of North America* **52**, 281-195.
- Bailit, H., Newhouse, J., Brook, R., Duan, N., Goldberg, G., Hanley, J., Kamberg, C., Spolsky, V., Black, A. and Lohr, K. (1985): Does more generous dental insurance coverage improve oral health? *Journal of the American Dental Association* **110**, 701-707.
- Campbell, S., Braspenning, J., Hutchinson, A. and Marshall, M.N. (2003): Research methods used in developing and applying quality indicators in primary care. *British Medical Journal* **326**, 816-819.
- Cochrane, A.L. (1972): *Effectiveness and efficiency; random reflections on health services*. London: Nuffield Provincial Hospitals Trust.
- Coventry, P., Holloway, P.J., Lennon, M.A., Mellor, A.C. and Worthington, H.V. (1989): A trial of a capitation system of payment for the treatment of children in the General Dental Service. Final report. Dental Health Services Research Unit, University of Manchester. *Community Dental Health* **6**(Suppl 1), 1-63.
- Daly, B., Watt, R.G., Batchelor, P. and Treasure, E.T. (2002): Problem with health services. In: *Essential dental public health*, p. 329. Oxford: Oxford University Press.
- Fitch, K., Bernstein, S., Aguilar, M.D., Burnand, B., LaCalle, J.R., Lázaro, P., Loo, M., McDonnell, J., Vader, J.P. and Kahan J.P. (2001): *The RAND/UCLA appropriateness method user's manual*. Santa Monica: RAND Corporation.

- Gift, H.C., Gerbert, B., Kress, G.C. and Reisine, S.T. (1990): Social, economic, and professional dimensions of the oral health care delivery system. *Annals of Behavioral Medicine* **12**, 161-169.
- Hessari, H. (2009): *Oral health among young adults and the middle-aged in Iran*. Dissertation. Helsinki: University of Helsinki. helda.helsinki.fi/bitstream/handle/10138/20284/oralheal.pdf?sequence=1
- Hosseinpour, R., Ebrahimi, E., Sani, M.M. and Shahsavari, B. (2010): [A review of functions and goals of dental sector in Iran's health system]. *Today's Dentistry* (in Persian) **43**, 19-28.
- Ingle, J.I. and Blair, P. (1978): *International Dental Care Delivery Systems; Issues in Dental Health Policies*. Battle Creek, Michigan: W.K. Kellogg Foundation.
- Jadidfard, M.P., Yazdani, S. and Khoshnevisan, M.H. (2012): Social insurance for dental care in Iran: a developing scheme for a developing country. *Oral Health and Dental Management* **11**, 189-198.
- Kahan, J.P., Bernstein, S.J., Leape, L.L., Hilborne, L.H., Park, R.E., Parker, L., Kamberg, C.J. and Brook, R.H. (1994): Measuring the necessity of medical procedures. *Medical Care* **32**, 357-365.
- Kahan, J.P., Park, R.E., Leape, L.L., Bernstein, S.J., Hilborne, L.H., Parker, L., Kamberg, C.J., Ballard, D.J. and Brook, R.H. (1995): Variations by specialty in physician ratings of the appropriateness and necessity of indications for procedures. *Medical Care* **34**, 512-523.
- Kutzin, J. (2001): A descriptive framework for country-level analysis of health care financing arrangements. *Health Policy* **56**, 171-204.
- Whelton, H. (2004): Efficiency in oral health care; The evaluation of oral health systems in Europe. In: Bourgeois, D.M. and Llodra, J.C., *European Global Oral Health Indicators Development Project; 2003 Report Proceedings* pp48-59. Paris: Quintessence International.
- World Health Organization (2000): *The World Health Report 2000; Health systems: Improving Performance*. Geneva: WHO.
- World Health Organization (2010): *The World Health Report 2010; Health Systems Financing: The Path to Universal Coverage*. Geneva: WHO.
- Widström, E. and Eaton, K.A. (2004): Oral healthcare systems in the extended European Union. *Oral Health and Preventive Dentistry* **2**, 155-194.
- Yule, B. (1988): *Financing of Dental Care in Europe: Part 2*. Copenhagen: World Health Organization.
- Zickert, I., Jonson, A., Klock, B. and Krasse, B. (2000): Preventive dentistry: Disease activity and need for dental care in a capitation plan based on risk assessment. *British Dental Journal* **189**, 480-486.