

How are dentists recruited, hired and paid over the world? A scoping review

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Abstract

Background: *Studies on human resources for health (HRH), particularly in Dentistry, are scarce, although the subject is an important component contributing to decrease with the inequalities of access to the public health services, especially in the social vulnerability areas.*

Methods and analysis: *The purpose of this study is to characterize and analyze, the dentist recruitment, hiring and payment types by means of the scoping review methodology using, as the theoretical rationale, the resource hiring framework develop by the World Health Organization's (WHO) Health Service Provision Department. Following the application of the scoping review eligibility criteria, 33 studies were included. The categorization was conducted according to the studies' approach and in compliance with the framework; considering that the public or private health services are provided in different*

ways in each country. The studies were, then, grouped into three categories: i) type of contract for the dentists and the impact to the patient care, ii) dental health insurances and the implications in the dentist's work market, iii) salaries and benefits with view to the recruitment of dentists in the public service. The forms of remuneration identified in the studies were: fixed salary, fee-for-service, for capitation or mixed.

Discussion: *The relationship between the type of contract and remuneration in recruitment and in the quality of the service provided was evidenced, revealing that the human resources contracting issue in Dentistry directly influences the health service provision to the population. Public policies informed through scientific evidence are important to collaborate with equity in the access to the services improving the distribution of the human resources for health, providing appropriate incentives and work conditions, with efficient personnel selection processes, so that the countries can reach the WHO global strategy principles for HRH, providing availability, accessibility, acceptability, and quality of the workforce.*

Keywords: Human resources for health. Public Health. Oral Health. Primary care. Dentistry.

BACKGROUND

The lack and poor distribution of health professionals, with professionals concentrated in urban areas, have been noted in the literature as an important component of inequities in the access of more vulnerable populations or those in remote areas to the health services, however, few studies include dentists, privileging publications in the medical and nursing areas^{1,2,3}.

In 2014, the Global Forum of Human Resources for Health held in Recife, Brazil, discussed the need to reduce the inequalities in the distribution of the health professionals and the importance of extending the universal health coverage, highlighting the importance to obtain evaluability (stock and qualification of the health works to meet the population's need), accessibility (equity in the access to the health services), acceptability (capacity to treat everyone with dignity) and quality (knowledge and qualification of the health workers).

The allocation of human resources is a relevant topic discussed in the countries which are part of the OECD, and in its document "Health Workforce Policies in OECD Countries - Right Jobs, Right Skills, Right Places", the main political trends and priorities in the workforce in health are analyzed⁴.

Glick in a Federal World Dental Federation (FDI) document states that greatest investments in oral health and in the professionals' education are required to decrease the inequities⁵.

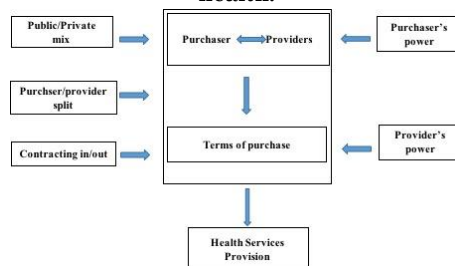
The inclusion of oral health in public health policies is essential so that the population without access to the private service is equally assisted. Analyzing the hiring, remuneration and recruitment of human resources for health (HRH) is essential to provide scientific evidence which may contribute with the health policies, once the professional behavior and, consequently, the service provided to the patient, can be influenced by the form of remuneration^{6,7}. Both the problem of the work relations and the HRH distribution are directly related to the development barriers of an efficacious, efficient and effective health system. Currently, the scientific evidence point out four great strategy groups to improve the recruitment and establishment of dentists, namely, education, regulation, personal and professional support and financing, however, the latest is poorly explored concerning the different forms of professional relationship⁸. In this context, the purpose of this scoping review was to characterize and analyze the dentist recruitment, hiring and remuneration types.

METHOD

A scoping review was conducted to answer the question: how are dentists hired, recruited and paid over the world?

The use of the framework has shown to be an interesting strategy and used by the World Health Organization (WHO) and by the World Bank to systematize the health area studies. Following this trend, to organize our study, a conceptual framework developed by the WHO health service provision department proposed by Zurn and Adams⁹ which explain the HRH hiring mechanisms was chosen, emphasizing the importance of the employer, the resource provider, of the contract terms and their interrelationships impacting health service supply (Figure 1).

Figure 1 – Framework for evaluating the hiring of human resources for health.



Source: Zurn and Adams (2004)⁹.

The central axis of the framework shows the structuring aspects of HRH contracting: the employer (public service, private organization or public/private partnership) and the financing agent or resource provider (company, municipality, state or federal government). The interrelationships between the employer and the resource provider will determine the types of contracts. Further in this component are the types of contracts concerning the regimen: public agent, direct hiring, temporary job. Such axis is influenced by different determinants which are in the external axes of the conceptual framework, the ones to the left: public service, private service and public-private partnerships; service provider employer (the HRHs employer, which can be a public, a social organization, a philanthropic institution or private company); hiring / dismissal (procedures applied in recruitment and dismissal, remuneration and benefits). On the right side, there are two additional components of the framework: hiring power (quality: title required at hiring), amount (vacancies available) and distribution; the financing power, in its turn, interferes in the entire hiring and resource provision process. Such set of factors directly influences the health professional relationship with the service and in the quality of the provided service.

The review followed the steps proposed by Arksey and O'Malley (2005)¹⁰; this approach is divided into five steps: Step 1: identifying the research question. A broad research question was elaborated: Which current landscape, described in the available scientific literature, refers to hiring, recruitment and remuneration of dentists over the world? Step 2: identifying the relevant studies: A search was conducted in scientific databases until March 2019: PubMed, *Biblioteca Virtual de Saúde* (BVS) and Epistemonikos using the keywords related to the subject to be researched, according to the used base (the strategies are attached as supplementary material). The references of the studies identified in the search were manually analyzed to include relevant articles which have not possibly been included and the repeated studies were excluded. In addition, Health organization websites were analyzed, in search of the gray literature related to the dentist hiring, recruitment and remuneration subject; Step 3: conducting the selection of the studies: The titles and abstracts of the studies included in the search were read by two independent evaluators, and those relevant to the study objective were selected, in cases of disagreement a third evaluator conducted the tiebreaker. The selected studies were fully read to map the study-relevant data. There were no date and language restrictions. The inclusion criteria were as follows: empirical studies, case and theoretical studies concerning the dentist's recruitment, hiring and remuneration. The exclusion criteria were studies which did not include dentists, or which did not report the dentist's recruitment or hiring or remuneration. Step 4: mapping the findings: The relevant information from the selected studies was extracted according to

table 1; and Step 5: grouping, summarizing and analyzing the results. An analysis of the types of contracts and forms of remuneration recurrent in the included studies was conducted. The studies were, then, grouped into three categories: i) type of contract for the dentists and the impact to the patient care, ii) dental health insurances and the implications in the dentist's work market, iii) salaries and benefits with view to the recruitment of dentists in the public service.

Table 1: Information collection instrument of the included publications

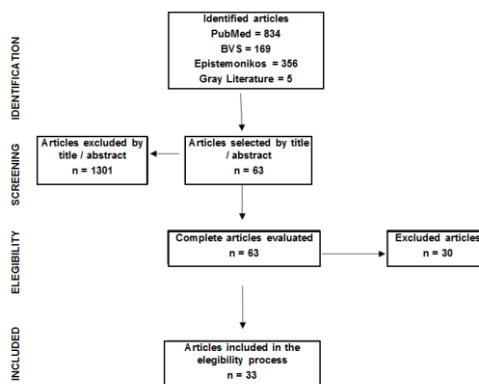
Considered information
Year, journal, authors, place, country
Objective, method, main findings
Professionals involved in the study - dentists
Type of contract – public / private
Types of remuneration
If the publication analyzes or reports the Dentistry work market (Availability, Accessibility, Acceptability and Quality of the workforce)

Source: elaborated by the author

RESULT

Following the application of the described scoping review methodology, 834 articles were identified in PubMed, 169 in BVS and 356 in Epistemonikos. After the titles and abstracts were read, 1301 were excluded and 63 were selected. They were read in full, and after the eligibility process described in the methodology, 28 studies were included in the analyses, plus 5 documents of the gray literature, in a total of 33 studies (figure 2)

Figure 2 – Article selection process flowchart.



Source: elaborated by the author.

The selected studies were divided into the following countries/continents: United Kingdom/England (10), Norway (2), United States of America (6), Brazil (4), Israel (1), Europe (1), Sweden (1), Northern Ireland (1), China (1) and South Africa (1). The profile of the journals which published such works consisted, mostly, dentistry journals, followed by medicine and collective health journals. Concerning the year of publication, the early study included was from 1987 and the most recent one from 2017.

The findings of this review revealed that the relationships of the dentists contracts vary in the several countries, according to the health systems characteristics and to the sector, i.e., public or private, which made the categorization of the results difficult for the analyzes to be conducted, in addition, the purpose of this study was not to compare or elect the best system, but to analyzed how the dentists are hired in the different countries according to the available literature.

The categorization was conducted according to the studies' approaches and observing the framework used as theoretical rationale, namely: i) type of contract for the dentists and the impact to the patient care (Table 2), ii) dental health insurances and the implications in the dentist's work market (Table 3), iii) salaries and benefits with view to the recruitment of dentists in the public service (Table 4).

Following the objectives of this study and the framework logics, different standards related to the research subject were noted, requiring an organization of concepts related to the contracts and remuneration. Variations in the remuneration models were identified in the public, private service and in the dental health insurances.

The contract provided different forms of remuneration: for hour (hours worked or fixed salary), for result or product (fee-for-service, episode/case) or for capitation (based on a number or type of patients under the professional's responsibility), in addition to the mixed type of remuneration which comprises a fixed salary and a variable part dependent on productivity (Tables 2 to 4).

Category I: type of contract for the dentists and the impact to the patient care

This category included the types of contracts for dentists and the impacts that the different types of contracts or remuneration cause to the care or services provided to the patient. Of the 15 studies included, 9 were conducted in the United Kingdom and England, 2 in Norway, 1 in China, 1 in Sweden, 1 in Northern Ireland and 1 in Brazil (Table 2).

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Table 2 – Category I results: Type of contract for the dentists and the impact to the patient care

AUTHORS / PUBLICATION YEAR	COUNTRY/ LOCATION	METHOD	YEAR OF DATA COLLECTION	OBJECTIVE	MAIN FINDINGS	EMPLOYER / PROVIDER			RECRUITMENT				CONTRACT/ REMUNERATION			
						PUBLIC	PRIVATE	NOT MENTIONED	PUBLIC SECTOR RECRUITMENT EXAMINATION	OTHER	NOT MENTIONED	FEE-FOR-SERVICE	CAPITATION	FIXED SALARY	MIXED	
Covenry et al., 1989 ¹	United Kingdom	Clinical Trial	1986 - 1989	Clinical trial to compare the for capitation and fee-for-service remuneration types in the GDS in 3 areas in England and one in Scotland	The dentists who worked under the capitation system saw the patients on a lower frequency and took less radiographs, and restored the teeth later, the ones under the for procedure system conducted more preventive consultations	x					x	x	x			
Melby, 1994 ²	England	Longitudinal study	1986 -1989	To examine the costs and treatments performed in four areas in England with payment per children capitation	The youngest dentists provided more preventive treatments than the older ones, the costs with restorations (fee-for-service) were higher in certain cities where the initial conditions of caries index were higher	X					X		X			X
Mellor et al., 1997 ³	England	Longitudinal study	1987/88 and 1992/93	To compare the treatment standards of general dentists who worked under service charge and for capitation	There were less restorative procedures and extractions for children and adolescents, however, more preventive procedures	X		X			X	X	X			
Sória et al., 2002 ⁴	Brazil	Literature review	2002	Two ways to analyzed the impacts and consequences to the dental assistance system were approached	Service charge: greater freedom of choice by the professional, capitation: conflict of interests (the dentist is interested in doing the minimum required)	X	X		X		X	X	X			
Wright; Batchelor, 2002 ⁵	England	Case study	Not mentioned	To identify the general practitioner preferences for different remuneration types and their beliefs concerning the effect of the mechanisms to the care	The general practitioners noticed that the remuneration mechanisms are important to determine the care provision, but not the general levels of the disease. The remuneration mechanism may affect the quality of the provided services	X		X			X	X			X	X
Grytten et al., 2009 ⁶	Norway	Longitudinal study	1999 -2002	To examine the effects of a remuneration system based on incentives to the number of individuals under supervision and to the quality of the public dental services	The transition to an incentive-based remuneration system (per capita and fixed salary) took to an increase in the number of individuals under supervision, without any drop to the quality or a patient selection effect	X					X		X	X		

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Tivkle et al., 2011 ¹⁷	England	Case study	1992-2009	To examine the impact of the changes to the financing of contracts for dentists who work in the NHS	The treatments which can be provided at a lower time increased and treatments taking longer time or with higher material costs were substantially decreased.	X		X				X	X				
Lo et al., 2011 ¹⁸	Hong Kong / China	Longitudinal study	1999	To evaluate the change from the salary pay system to the for item or procedure system	There was an increase in the services provided to the patients	X						X	X	X			
Brocklehurst et al. 2013 ¹⁹	United Kingdom	Systematic review	1947 - 2013	To evaluate the effect of different remuneration methods and the impact to the patients' results	It revealed the low quality of the evidence and it was not possible to determine if there was an impact to the patients' results	X	X					X	X	X	X	X	X
Grytten et al., 2013 ²⁰	Oslo / Norway	Case study	1999 - 2016	To examine the effect of the system remuneration to the dental attendance quality	The transition to the for capitation system did not reduce the quality of the provided services	X						X				X	X
List: Chaakley 2014 ²¹	Switzerland / Kingdom	Case study	1998 - 2007	To identify the impact of financial incentives to the use of dental check-up exams	The different provider pay methods have a substantial impact to the use of the services.	X		X				X	X		X		
Malone; Conway, 2015 ²²	United Kingdom	Systematic review	2013	To evaluate the effects of different remuneration methods of primary care dentists and the impact this has to the patients' results	The number of included studies is limited and the quality of the evidences of two included studies was low / very low for all the results	X		X				X	X	X	X	X	X
Strand 2015 ²³	Sweden	Case study	2013	To investigate the patients experience under a new for capitation pay system	The choice for the capitation system was based on the long term safety	X						X	X	X			
Hulme et al., 2016 ²⁴	United Kingdom	Case study	2012-2013	To evaluate the efficacy and cost-benefit of a new mixed contract compared to the service charge one	The patients from the mixed contract had more procedures performed (tooth extraction and filling), however, 47% of the patients did not return for control	X						X	X				X
Hill et al., 2017 ²⁵	Northern Ireland	Longitudinal study	2011-2014	To examine how the patients results differed between the per capitation Oasis practices, compared to a combination set of control practices paid for traditional FFS pays	There was no evidence of patient selection in both practices, however, the patients received less treatments	X						X		X			X

Source: elaborated by the author.

There are reports in the literature that the remuneration methods may affect the clinical activity of the primary attention dentists. The more employed remuneration methods presented were: fee-for-service (for procedure), fixed salary, capitation (based on the number of patients or cases assumed by the dentist) and combination pay between these two previous modalities. A clinical trial conducted in the United Kingdom, after evaluating children treated by dentists who provided services for capitation and pay for procedures; it was noted that those who were under capitation had their tooth restores later and were submitted to less preventive consultations¹¹. A systematic review approached the financial incentives involving the transfer of the patients' or third-parties' (government or insurance companies) resources to dentists, however, it revealed the low quality of the evidence concerning such changes to the clinical activity and it was not possible to determine if there was an impact to the patients' results¹⁹. In Scotland, the dental services are provided by private dentists and in the public service, through the National Health Service (NHS) and General Dentist Services (GDS), which are responsible for hiring most of the dentists. The services are paid through four different modalities: 1 – the patient pays a fee and the dentist receives for service charge, 2 – the patient pays a fee and the dentist receives a salary, 3 – the patient is exempt from fees and the dentist receives for service, 4 – the patient is exempt from fees and the dentist receives a salary. Listl and Chalkley²¹ evaluated the impact of the pay modality to the use in the dental checkup visits and concluded that the different pay methods to the provides have a substantial impact to the use of the services, and this must be taken into consideration by the decision makers in order to optimize the incentive for the return visits (prevention). In Norway, the dentists are included in the public system. Grytten et al.¹⁶ examined the remuneration system effects to the dental attendance quality through the databank of 18-year-old patients in the period of 1999 to 2006 (the dental attendance in this country is for free to the age group from 0 to 18 years, and also, for mentally disabled adults, elderly people, people with chronic diseases and people receiving disability pension who live in an institution or who receive home nursing care). The public system remuneration for dental professionals, in Scandinavian countries, consists in a fixed salary; they were given the opportunity to negotiate the fixed salary contract to a for capitation and fixed salary combination contract. In this study, the transition to the for capitation system did not reduce the quality of the provided services, although in other studies, such pay system has encourage dentist to see more patients decreasing the time of the visit for each patient, what may generate a worse quality to the provided services. Another study examined the effects of an incentive-based remuneration system related with the number of individuals being supervised and with the quality of the provided public dental services;

the main conclusion was that the transition to an incentive-based remuneration system led to an increase in the number of individuals being supervised, without a drop in the quality or a patient selection effect²⁰. In a systematic review, the effects of different methods of remuneration were evaluated, in addition to a mix of such methods in the primary care and the impact to the patients, and it was concluded that the financial incentives in the remuneration systems may produce changes to the clinical activities, such as, for example, higher number of extractions and restorations, however, the quality of the evidences of the include services was considered as being low²². Another study conducted in England compared the standards of treatment conducted by general dentists under two types of contracts: service charge and capitation; and noted that the professionals who worked under capitation conducted less exams, restorations, and extractions, and that the patients received more preventive care¹². When evaluated in England, four areas on which the treatments in children were paid for capitation, it was noted that the youngest dentists promoted higher amount of preventive treatments¹². In Brazil, a descriptive study indicated a population with high treatment demand and excess of professionals and reported the main forms of payment described in the literature, related with the patient satisfaction¹⁴. Concerning the fee-for-service or procedure pay, it was note that the patient is generally satisfied and there's no financial risk to the professional; however, for the health system, the possibility of under- and over-treatment must be taken into consideration, once the professionals have difficulty to separate the required treatment from what can be done. In capitation model, in its turn, where the dentist receives a monthly value before conducting the treatment (pre-paid), the patient and the professional satisfaction tends to be lower and to the health system, the possible undertreatment must be taken into consideration. Conducted in England, a study evaluated the impact of the changes to the financial incentives structures to the behavior of the dentists who work in the NHS as a result of a new national contract¹⁷. The treatments which can be provided at lower time (therefore, lower cost to the dentists), such as extractions, increased, and treatments which take longer time or present higher costs with materials, such as prostheses, crowns and restorations were substantially reduced; it can also be concluded that changes to the financial incentive structure may produce great and abrupt changes to the professional behaviors. Through a qualitative study, the influence of different incentive systems was evaluated in the motivation of dentist in the United Kingdom¹⁵. The dentists showed a technical concern with the work, what produced stresses concerning the cost containment on a fee-for-item remuneration, influencing the services provided to the patients. The pay for capitation was introduced in Northern Ireland to contain costs, however, it was noted that there was a reduction in the access of the patients to the

treatments when compared to the control group on which the professionals received a service charge²⁵. Patients in the public service in Sweden were interviewed with respect to the new for capitation system in replacement of the service charge and most of them approved the capitation once it provides more security over the time²³. Lo et al., evaluated the results of the change to the pay for salary to fee-for-service in a dental clinic of a university which served the students and employees, and noted that the dentists became more productive and there was an increase to the provided services¹⁸. A controlled, non-randomized study conducted by Hulme et al., comparing the results of the for-procedure contract being replaced a mixed contract, revealed that in the latest type of contract the patients received greater amount of provided services, especially extractions and restorations²⁴.

Category II: Dental health insurances and the implications to the dentist's work market

This category gathered studies addressing the dental health insurances and the implications to the dentist's work market. 5 studies were included, 4 from the United States of America and 1 from South Africa (Table 3).

Table 3 – Category II results: dental health insurances and the implications to the dentist's work market

AUTHORS / PUBLICATION YEAR	COUNTRY/LOCATION	METHOD	YEAR OF DATA COLLECTION	OBJECTIVE	MAIN FINDINGS	EMPLOYER / PROVIDER			RECRUITMENT			CONTRACT/ REMUNERATION				
						PUBLIC	PRIVATE	NOT MENTIONED	SECTOR	RECRUITMENT EXAMINATION	OTHER	NOT MENTIONED	FEE-FOR-SERVICE	CAPTATION	FIXED SALARY	MIXED
Zatz et al. 1987 ²⁶	USA	Descriptive study	Not mentioned	To analyze and compare the several methodologies for the reimbursement of dental benefits.	The authors described all the dental reimbursement forms and hope it helps the dentists in their choices		X					X	X			
Branson et al. 1998 ²⁷	USA	Descriptive study	Not mentioned	To describe the dental health plans' characteristics	They approached the practical characteristics of dentists who are part of such plans, highlighting the positive points of their performance and the best opportunities to expand the number of patients		X				X	X				
Shenkin, 1999 ²⁸	USA	Descriptive study	1999	To approach how a form of reimbursement affects the dentist profession	The dental health plans increased the dental treatment possibility both in the sector public and in the private one.		X				X	X				

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Mathabathe et al., 2000 ²⁸	Gauteng / South Africa	Case study	2000	To determine the dentist's point-of-view concerning the managed health care	The findings indicated that the professionals are unbelievers concerning the MHC.	X				X	X			
Gotowska, 2001 ²⁹	USA	Descriptive study	Not mentioned	To describe the growth of the DPPO (dental benefit plan companies)	The pay approach was fee-for-service, and highlights that the plans can increase the population coverage with dental services, in addition to being of benefit for the professionals	X				X		X		

Source: elaborated by the author.

Shenkin²⁸ reported that the dental health plans had an expressive increase in recent years in the USA, what increase the offer of dental treatment to the population, however, such access is still limited to less than half of the American population. The data show that the knowledge about the consequences of such change is poor, for example, concerning the possibility of over- or undertreatment, which is directly related to the quality of the oral health care. This article highlights the dental practice and the profits, evidencing the important role of the dental insurances in the professional practice. The Managed Health Care (MHC), initially offered in medicine, was introduced in South Africa in dentistry, using the American model of health insurance, and was seen as an alternative system to control the health care costs. The study analyzed the dentists' understanding and perception concerning such new approach in the country, and the findings indicated that the professionals are skeptical with respect to the MHC, highlighting concerns related to a new threaten to their practice and impairing the professional-patient relationship, what emphasizes the indication of stimulating more information to the dentists about such approach²⁹. A study conducted in the United States analyzed and compared the several health plans reimbursement methodologies reporting the advantages and disadvantages of the capitation method under the patient's, the dentist's, the plan administrators and purchaser's point-of-view, assisting the dentists with their choices to participate in the different programs, however, the study does not indicate the best option²⁶. Gotowska³⁰, approached the growth of the dental plans, however, highlighting that such growth is still slow in dentistry. The pay was conducted on a fee-for-service basis and highlighted that the plans can increase the population coverage with dental services, in addition to being of benefit for the professionals Study conducted in the Managed Care Marketplace information system by ADA's Council on Dental Practice approached the characteristics of practices of dentists who participate in such plans, highlighting the positive points of the action and better opportunities to expand the number of patients²⁷.

Category III: Salaries and benefits with view to the recruitment of dentists in the public service

The studies reporting strategies such as salaries and benefits were grouped in this category, with view to greater recruitment of dentists in the public service. 8 studies were included, 2 from the United States of America, 1 from England, 1 from Israel, 1 in Europe and 3 from Brazil (Table 4)

Table 4 – Category III results: salaries and benefits with view to the better recruitment of dentists in the public service

AUTHORS / PUBLICATION YEAR	COUNTRY/LOCATION	METHOD	YEAR OF DATA COLLECTION	OBJECTIVE	MAIN FINDINGS	EMPLOYER / PROVIDER			RECRUITMENT			CONTRACT/ REMUNERATION			
						PUBLIC	PRIVATE	NOT MENTIONED	PUBLIC RECRUITMENT EXAMINATION	OTHER	NOT MENTIONED	FEE-FOR-SERVICE	CAPITATION	FIXED SALARY	MIXED
Levy et al., 1990 ³¹	Israel	Case study	Not mentioned	They evaluated two remuneration methods in Israel Armed Forces	The pay for procedure and fixed salary method was adopted in a special project in order to decrease the waiting time for prosthetic treatment in Israeli Armed Forces. The dentist were more productive and earned more with the new method	X					X			X	X
Bolin and Shulman, 2004 ³²	USA	Descriptive study	2004	To quantify the vacancies in the community centers and compare the current salaries and benefits	The government incentives (Medicaid, NHSC, IHS) to recruit the dentists in such centers were not successful. The candidates who declined the vacancy mentioned inappropriate salaries and benefits	X			X					X	
Bolin, Shulman, 2005 ³³	USA	Case study	2002	To quantify the vacancies in the community centers and compare the salaries with other career options	The incentives to recruit and retain dentists in such centers were not successful. Although the salaries are better than in the academic area, they are lower than in the private sector and there are no benefits	X				X				X	
Hornby et al., 2006 ³⁴	Midlands / England	Multi-method study	2002 -2003	To explore the NHS workforce in Shorpsire and Staffordshire	The change from NHS to the private work, retirements and disappointment with the remuneration lead to a lack of dentists in the area	X		X		X					
Martelli, et al., 2010 ³⁵	Brazil	Case study	2005	To characterize the profile of the dental surgeons in the FHP	The results showed that 70.4% of the dentists are female, with prevalence in the age group of 31 to 49 years, being that 65.2% of them are hired under the form of contract.	X			X					X	

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Lenzi et al., 2010 ³⁶	Brazil	Case study	2008	To evaluate the profile of the dental surgeons included in the Programa Saúde da Família [Family Health Program], in the municipality of Santa Maria - RS	Most of the interviewed individuals were women between 28 to 45 years of age. The dentists joined the FHP through temporary contract, work in teams and are pleased with the work	X			X							X	
Gallagher; Eaton, 2015 ³⁷	Europe	Case study	2011	To examine human resources in oral health in Europe with a framework used in a case study in England	England developed a management system which affects the professionals' organization, in other countries, governance is limited. One of the great changes in Europe was the workforce migration. Governance promotes the employment facilitation for undergraduates according to the population demand	X					X						
Da Silva Moço et al., 2017 ³⁸	Brazil	Case study	2006 -2014	To evaluate the characteristics of the public sector recruitment examinations intended to hire dentists for the FHP	Most of the public sector recruitment examinations was conducted in the Southeast region, State of Minas Gerais. Collective Health Contents were required only in the minority of the recruitment examinations	X			X							X	

Source: elaborated by the author.

In the United States, the community health centers serve the low-income population and migrants. The government incentives (Medicaid, National Health Service Corps - NHSC, Indian Health Service - IHS) to recruit the dentists in such centers were not fully successful. In the study by Bolin and Shuman³², questionnaires were sent to the community centers directors and dentists, performing a national recruitment and salary survey. The candidates who decline the position mentioned the inappropriate salaries and benefits and, as the research was anonymous, it was not possible to geographically track where the recruitment problem occurs preventing the monitoring which would regulate more assertive actions to solve the problem. In another study from 2005, Bolin and Shulman³³ reported that the salaries of the dentists who work in community centers are higher than those of academic positions, but lower than those of the private sector, in addition not to offer any benefits. In Brazil, public sector recruitment examinations are conducted in order to recruit dentists to work in the public service, according to Silva Moço et al.³⁸, they showed public service announcements which were inaccurate, with lack of important information for a secure decision to participate in the selection process. Most of the recruitment examinations was conducted in the Southeast region, State of Minas Gerais, leading to the conclusion that direction is requirement, particularly with respect to the knowledge required in the tests, so that the professional with appropriate profile and knowledge is selected for the work in primary care, particularly in the Estratégia Saúde da Família [Family Health Strategy] (ESF). Martelli et

al.³⁵, characterized the profile of the dentists included in the primary health care in the Estratégia de Saúde da Família in municipalities of the State of Pernambuco, Brazil. The results showed that 70.4% of the dentists are female, at the age between 31 to 49 years, being that 65.2% are hired with irregularities in the contract (precarious contracts). Conducted in Santa Maria (Rio Grande do Sul - Brazil), another study concluded that most of the ESF dentists, of primary health care, are women and the age group is comprised between 28 and 45 years of age. Most of the dentists joined the Family Health Program through another temporary contract and performed a workload of 40 hours a week. All the interviewed individuals were experts in Collective Health, worked in teams and were pleased with the work they did in the ESF³⁶. The dental attendances in the Israel defense forces promote the emergency treatment to the soldiers, traumas, and injuries occurred in the battles or training and the treatment to the population who serve the armed forces. The increase in the demand for dental care made the recruitment of dentists difficult only in the permanent military force; then, the civil dentists were recruited to solve this problem, particularly in the placement of prosthetic crowns. A new remuneration method was studied for dentists in order to decrease the waiting time for prosthetic treatment. Such new combination method of pay for procedure and fixed salary was adopted by the Israel Defense Force (IDF) because the more productive dentists earned more³¹. Gallagher and Eaton³⁷ conducted a study with oral health human resources data from Europe, using a governance model applied in England for organization, availability, and distribution of professionals. Such workforce governance facilitates the dentist's recruitment planning according to the population's demand. A study conducted in England³⁴, explored the opportunities for the development of the workforce in general dental services of the NHS (GDS) in Shropshire and Staffordshire; the results confirmed that there's a lack of dentists in the area, influenced by multiple factors, including disappointment with the NHS' policies and remuneration, the change from the NHS to the private work and the decision to retire earlier.

Gray Literature

After evaluating the gray literature documents, efforts organizations to disclose documents and strategies to improve the HRH stock were noted, revealing the importance and need for studies on the subject. In the WHO, with the purpose of optimizing the performance and quality of the human resources for health through policies informed through evidenced, and contributing for an effective universal coverage, the global strategy for human resources for health was describe disclosing the objectives of availability, accessibility, acceptability, and quality of the workforce⁸. According to Zurn et al¹, the imbalances of public health indicators in the different countries are

difficult to be evaluated due to the different health systems presented, with no possibility to compare them; however, the studies on HRH may contribute to improve the distribution of such resources. The report by the Organization for Economic Cooperation and Development (OECD), which joins 36 countries, analyzes the recent needs and policies adopted by the member countries for HRH policies⁵. A document called FDI Vision 2020⁵, reports that the dental profession requires a comprehensive, long-term view, of the main challenges the oral health faces and how the profession can grow in order to contribute for the improvement of the global oral health over the next decade, and reveals the need for investment in workforce, particularly with view to the promotion of oral health^{5,39}. In 2017, the Ordem dos Médicos Dentistas of Portugal published the “*Diagnóstico à empregabilidade*”⁴⁰, which revealed that the beginning of the dentist career, as the Dentistry professionals are called, in the beginning of the activity presents low remuneration and only 24% have a fixed remuneration, the method of payment of 60% of the patients is directly to the professionals and only 10 to 13% are served by the public system. In Brazil, the Ministry of Health provides programs such as PROVAB⁴¹ (Program for the Valuation of the Basic Healthcare Professional), instituted in 2011 to extend the teaching-service integration with the community and provision of professionals in sanitary gap areas. The PAHO (Pan American Health Organization) in partnership with the Brazilian Ministry of Health, comprises a network of observatories of human resources for health in order to encourage research and make information available with the purpose of improving the public policies in health⁴³.

DISCUSSION

This review was structured from the framework described by Zurn and Adams⁹ for WHO's Department of Health Service Provision, which relates the relationships between the employer and the hired individual, having the type of health service (public or private) as an influencer of such relationships and affecting the health service supply. The poor distribution of human resources for health is a worldwide phenomenon and the planning of the regulation and strategies directed towards the HRH hiring are some essential factors to contribute for the equity in the access to the health services to be reached. According to the WHO, the human resources are a crucial part of any health system. In 2014, in Recife, the 67th World Conference on Human Resources for Health stated that “*there's no health system without human resources*”. In 2016 “The Global Strategy on Human Resources for Health: Workforce 2030”, called WHO Health Workforce 2030⁸ emphasizing the importance of availability, accessibility, acceptability and quality of the work force for the health systems, renewing the commitment with the universal health

coverage; therefore, the forms of hiring and remuneration must be studied for a better understanding of the entire landscape which includes such subject³⁹. The dentists hiring and remuneration is a poorly explored subject in the human resources for health researches³, calling the attention of research groups and Human Resources Observatories, due to the relevance of such subject and its importance to make the health work and access of the population to the professional of this area feasible, and the need to advance in research to inform and strengthen the information systems.

A scoping review showed important difference in the dentists hiring and remuneration over the world, particularly due to the diversity of the health systems included in the study, and how such countries provide these services, i.e., only through the public sector, exclusively in the private sector or a public-private combination. Considering such differences, these variations were identified and analyzed so as to better understand such dynamics and not to compare or elect an ideal form, because this may facilitate better choices by the different employers, whether they are from the public or private sector.

The analysis of the studies included in category I allowed to note that the type of contract of the dentists impacts the results of the service provided to the patient¹⁰⁻²⁴; and this result is of extreme relevance, as we recognize that the oral health is part of the whole patient health^{44,45}. Thus, understanding how the different types of contract and remuneration of the dentists and how they may influence the provided care, starts to be crucial, especially concerning the health management planning. Such variations may pose a risk to the patient health; some articles suggest that the variation cannot be seen just as market issue but as a health issue^{20,28}. The results suggest important impact to the amount and quality of the provided service, such as, for example, the patient over- and undertreatment. The countries must consider such impacts to organize their health systems, particularly in the universal public systems such as the SUS [Brazilian Health System], which include the oral health in the public health services. The qualification and appropriate selection of professionals may transform the practice and create mechanisms which regulate the provided services, with view to minimize the possible damages to the population's health. Concerning management, Ordell⁴⁶ points to the need to induce a balance between a good work for the dentists, an efficient organization and a good service perceived by the public. In other studies, it is also observed a direct relationship between the management and the practice perceived in the clinic⁴⁷, with management tools to contribute and impact the final attendance to the patient⁴⁸.

In category II, concerning the dental health insurances and the implications in the dentist's work market²⁶⁻³⁰, it was possible to identify a strong trend towards the increase in the offer of health insurances in the

dental area, particularly in the USA. Such increase can be justified due to the high-cost dentistry presents in the private sector (difficult access if the patient does not have an insurance) and also for the little or no availability of dental attendance in the public sector. Thus, the option to extend the insurances presents as a possibility to increase the access to this service. However, it is necessary to analyze the risks and benefits of this assistance model. The research in this area are essential to clarify such impacts to health, but they still present as a great gap to be filled.

Concerning the salaries and benefits, with view to a higher and better recruitment of dentists in the public sector, category III³¹⁻³⁸, it was possible to observe that the reality in the countries demand good recruitment strategies to make the availability and geographic distribution of the dentists in the public sector feasible.

One of the greatest challenges of the health systems is the distribution and establishment of professionals, so that the access to the services is guaranteed to the entire population, preventing sanitary gaps and inequities in health³ and with this respect, the hiring forms and remuneration can be a differential for the success of such systems. Especially, in this category, the participation of Brazil in the included articles became evident, once its public system (Brazilian Health System – SUS) integrates dentistry in the primary, secondary and tertiary care^{44,45} and, it consequently presents a great demand for professionals in this area, emphasizing the strategy of public sector recruitment examination as a more efficient and democratic recruiting method⁴⁹.

In this context, the existing models related to hiring present strong relationship with the recruitment of the dentists in the public sector, although this is not a reality in most of the countries⁵⁰ yet, which has a managed assistance (health insurances) as the only form of assistance in addition to the private sector.

The studies included in the scoping review reflected the health system models of the countries, i.e., they related the health professionals options of inclusion in the work market, public, private and mixed, and different forms of remuneration: fee-for-service, fixed salary, capitation (based on the number or type of patient under the professional's responsibility) pay, or mixed models (combination) as a way to promote financial incentives within the systems in order to promote changes to the clinical activity, particularly in primary care. The poor number and low evidence of the studies was evident, although the relevance of the subject is essential to collaborate with the public, private or public-private management^{51,52}.

In a capitalist world, the remuneration, hiring, expenditures, efficiency subjects should be more centralized, and more studies must be conducted and even fostered by research agencies so that we could better

understand the complex phenomena which comprise such picture, resulting in more assertive decision makings and informed by scientific evidence. This scoping review evidence the relationship between the type of contract, remuneration and quality and amount of the service provided to the user; thus, as pointed out by Zurn and Adams⁹ in their conceptual framework, when they state that the set of factors comprising the issue of hiring the HSH directly influences the provision of the health services to the population.

CONCLUSION

The publications about the subject reveal the importance of the research on hiring, recruitment, distribution, and remuneration of human resources for health, despite of that, a gap of knowledge was noted, especially concerning the dentists, particularly in low and medium-income countries. Despite of this, impacts were revealed to the quality and amount of the services provided to the patient (overtreatment or undertreatment), when different forms of remuneration and recruitment are employed (fee-for-service, fixed salary, capitation, or mixed models pay).

Public policies informed through scientific evidence are important to collaborate with equity in the access to the services improving the distribution of the HRHs, providing appropriate incentives and work conditions, with clear and effective personnel selection processes, so that the countries can reach the WHO global strategy principles for HRH, providing availability, accessibility, acceptability and quality of the workforce.

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