

## Visualisation of Dental Technicians Distribution in Indonesia: A Review Article

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### Abstract

Objective to provide a descriptive review on dental technicians as a profession and their distribution in Indonesia based on a literature review.

Peer-reviewed articles were collected from PubMed and Google Scholar (year 2016 onwards), and Indonesian-based grey literature, such as the Indonesian law on dental technician, documents from the ministry of health, national data on health, and news media report were used. Dental technicians are competent to work in dental laboratories and health facilities within the scope of manufacturing both fixed and removable dental prosthetics, orthodontic appliances, and maxillofacial prosthetics in collaboration with dentists or dental specialists. Only 13 out of 100 Indonesian public health centres have their own dental technicians.

The main task of a dental technician is to plan, manufacture, and evaluate dental prostheses, such as full and partial dentures, fixed dentures, as well as to produce removable orthodontic appliances and maxillofacial prostheses. There is a maldistribution of dental technicians in Indonesia.

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### Introduction

In general, dental technicians are competent in producing means of dental appliance, such as fixed and removable dental prosthetics, orthodontic and maxillofacial appliances based on the consumer's (dentists or dental specialists) order. Being responsible and working in a dental laboratory, dental technicians are challenged to implement their skills gained from formal education to produce appliances in dimensional precision. Dental laboratory can be various in terms of geographical access, types of health facilities, and types of business models.<sup>1</sup>

Indonesia is an archipelagic low-middle income country which has a population over 265 million people. More than a half of the total

population are living in Java Island, the capital Island, which has the most developments and the highest population density among other islands.<sup>2</sup> Indonesian dental technicians are often misrecognized by people as the dentists who are competent in providing comprehensive oral health services. According to the facts, some people experienced oral health care by dental professionals (not dentists) with cheaper costs. They admitted that those dental professionals do not use medical safety standards like dentists and provide dental services using limited resources. Hygiene prior to, during, and after dental treatment are sceptically considered which has proven caused serious and fatal dental to systemic health consequences.<sup>3,4</sup>

Based on the data mentioned above, the writer is curious to find out in specific about the scope of competence as dental technicians and their distribution in Indonesia. The question is whether dental technicians provide dental health services to patients like dentists do, but with relatively lower tariffs or if those unprofessional dental practices are performed by people who

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replicates dentists' procedures without formal education and legal aspects. Interesting points to be also discussed in this paper is regarding the regulation under the dental technician as a profession and kinds of health facilities that possibly need dental technicians based on their management models<sup>5,6</sup>.

A descriptive review to provide information about the profession of dental technicians and their distribution in Indonesia is not conducted yet. The complex issues of the role between dentists, dental technicians and another dental professional have not been evidently and publicly explained. Therefore, this paper describes dental technician as a profession and its distribution in Indonesia.

#### Objective

The objective of this paper is to provide a descriptive review on dental technicians as a profession and their distribution in Indonesia.

#### Materials and methods

This paper is based on a literature review. Peer-reviewed articles were collected from PubMed and Google Scholar (year 2016 onwards), and Indonesian-based grey literature, such as the Indonesian law on dental technician, documents from the ministry of health, national data on health, and news media report were used.

#### Results

Dental technician is not well-known to the public so that people think that people who perform illegal dental practices, called '*Tukang Gigi*' in Indonesia, are dental technicians.<sup>7</sup> Dental technician is a profession whose work is in a dental laboratory, and their competencies are based on their body of knowledge gained from formal higher education.<sup>8</sup>

*Tukang Gigi* has indeed been widely known by the people of Indonesia, even before the world of Dentistry was established in Indonesia. They do not have medical safety standards like dentists since they gained skills from one generation to the next generations. The costs to pay for dental services are relatively affordable to most Indonesian people with low-middle socioeconomic level. In order to protect the public from medical services that are not in accordance with standards and its health

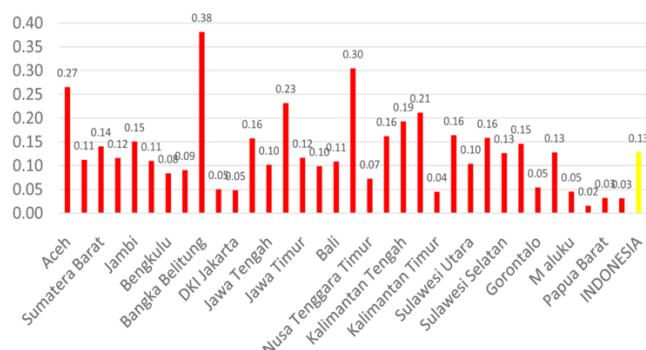
consequences, the government issued a Minister of Health Regulation (Permenkes) No. 1871/MENKES/PER/IX/2011 regarding the revocation of the previous Minister of Health Regulation No. 339/MENKES/PER/V/1989 which regulates the authority, prohibition and licensing of *Tukang Gigi* to perform dental fillings with any fillings; manufacture and installation of fixed dentures/cast crowns; using drugs related to dental fillings, either temporary or permanent; perform tooth extraction, either by injection or without injection; perform medical actions, including the administration of drugs.<sup>9,10</sup> Therefore, people who perform illegal dental services are not dental technicians, dentists, or other dental professionals who are legally registered in the council.

Dental technicians are competent to work in dental laboratories of health facilities or privately within the scope of manufacturing both fixed and removable dental prosthetics, orthodontic appliances, and maxillofacial prosthetics in collaboration with dentists or dental specialists.<sup>8</sup> They do not take medical action to patients directly. In producing fixed dental prosthetics, dental technicians use various materials, such as porcelain, metal, and zirconia. They use acrylic, *valplast*, and other materials to produce removable dental prosthetics.<sup>11</sup>

According to the Minister of Health's decision *Kepmenkes Nomor HK.01.07 / Menkes / 460 / 2020* regarding the professional standards of dental technicians are as follows<sup>1</sup>:

1. Dental technicians are professional workers.
2. Providing specialised services to the community.
3. Its profession is recognized and needed by the community.
4. Has the authority authorized or granted by the government.
5. Have clear roles and functions.
6. Have clear and measurable competencies.
7. Having a professional organization (*Persatuan Tekniker Gigi Indonesia/PTGI*) which continuously improves the quality of services provided to the community by its members.
8. Lifetime main job/source.
9. Service oriented and objective needs.
10. Autonomy in work.
11. Doing professional ties, licenses, career paths.
12. Have power and status in specific knowledge.
13. Dental technicians' services aim to support

services performed by dentists in performing dental technical work.



**Table 1.** Ratio of dental technicians per public health centres in Provincial Level of Indonesia<sup>11</sup>.

The ratio of dental technicians per public health centres in the provincial level of Indonesia is 0.13. Compared to the total number of public health centres per province in Indonesia, the number of dental technicians per province does not fulfil the total number of public health centres in the provincial level of Indonesia.<sup>12</sup>

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**Figure 1.** Map visualising the geographical distribution of dental technicians per area/province<sup>13</sup>.

According to the map on figure 1, all provinces have the ratio of dental technicians per public health centres of far below 1. It means that lack in numbers of dental technicians happens in all provinces of Indonesia.<sup>13,14</sup>

## Discussion

Based on the results section, Indonesian dental technicians work basically in health facilities and dental laboratories providing dental

appliances ordered by dentists and dental specialists. Their work is regulated by the Minister of Health's decision *Kepmenkes Nomor HK.01.07 / Menkes / 460 / 2020* regarding the professional standards of dental technicians, including their registration license.<sup>13,15</sup> Although dental appliances, such as fixed and removable dental prosthetics, orthodontic and maxillofacial appliances are used directly by patients, the dental technicians are prohibited to have direct contact with the patient.<sup>16</sup>

Supports from the Directorate General of Medical Services, Ministry of Health Indonesia in developing standards for dental technicians in health facilities was done through standardization, certification, licensing, and law enforcement together with the profession and the community to achieve the National Health System in the scope of public dental health to be optimal, efficient, quality, and affordable.<sup>17</sup>

Scarcity of materials, distribution of dental health facilities, and the distribution of dental technicians' school could influence the maldistribution of dental technicians in Indonesia. Dental materials are over 90% imported from China, Korea, Germany, Italy, and other countries. An uneven distribution of dental health facilities, especially public health centres that have a small number of dentists providing dental health services outside the capital Island. In total of 10 institutions possesses dental technicians' program as their study program and mostly located in Java and Bali Island.<sup>18</sup>

A combination of various dental health practitioners such as, dentists, dental specialists, dental therapist, dental hygienist, and dental technicians should be placed in an equal distribution based on geographical location to develop access to quality dental health services for the population. Private to public partnership programs should also be implemented to support the goals in achieving the optimum degree of dental health status in the population. Scarcity in career opportunities in remote areas could be a factor that influence the maldistribution of dental health practitioners, including dental technicians. Access to auxiliary materials in producing dental appliances is still a challenge in developing a dental health professional environment in remote areas or even outside Java and Bali Island.<sup>19</sup>

Programs in distributing dental technicians to remote areas of Indonesia has not been done yet by the government. In contrast to

the dentists, they are provided by the programs by the ministry of health or local governments, such as Nusantara Sehat and PTT Daerah. Well-being and access to public goods are issues associating the choice of dental technicians' preference to their working environment. Therefore, well-known dental laboratories in big cities of the capital Island are the most favourite places of dental technicians to work.<sup>13</sup>

Due to the development of information and technology in the global as well as in the national scope, the dental world has been shifted their dental service promotion styles into aesthetics and natural restorations. In this case, dental technicians in a dental laboratory play a big role in producing those required dental appliances. In terms of access to dental health facilities in the eastern part of Indonesia, such as Maluku and Papua Island, those sophisticated dental appliances made by dental technicians are left far behind.<sup>4,13</sup>

## Conclusions

The main task of a dental technician is to plan, manufacture, and evaluate dental prostheses, such as full and partial dentures, fixed dentures, as well as to produce removable orthodontic appliances and maxillofacial prostheses. There is a maldistribution of dental technicians in Indonesia. Compared to the total number of public health centres per province in Indonesia, the number of dental technicians per province does not fulfil the total number of public health centres in the provincial level of Indonesia. Only 13 out of 100 public health centres have their own dental technicians.

## Declaration of Interest

The authors report no conflict of interest.

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