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Perspective

Age distribution of dentist workforce in Taiwan



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The history of career of dentists in Taiwan is not long compared to that in other advanced countries. Currently, there are 8 dental schools in Taiwan. The dental school in the Military University, which was established in the mainland China in 1941 and moved to Taiwan in 1949, is the earliest dental school in Taiwan. From 1953 to 1960, Taiwan

established five dental schools in seven years, and the seventh dental school was established in 1980. Finally, the eighth dental school was established in 2019.¹ Obviously, due to the expansion of the number of dental schools, the number of dentists in Taiwan grew significantly after the 1960s. In fact, many senior dentists who entered the workplace in the early stages are still in their jobs. In the past, there was a lack of research on the age distribution of dentists in Taiwan. In this article, we initially explored the age distribution of dentist workforce and its relationship with the population structure in Taiwan.

In this analysis, the open information from the nationwide dental professional guild (Taiwan Dental Association, TWDA) was used to filter the data related to age distribution of their member dentists in February 2023. The

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numbers of dentists were published by the 14 age groups. Therefore, we also searched for corresponding population by the same age groups through the website of Department of Household Registration of the Ministry of the Interior. The numbers and their proportions of member dentists of TWDA and corresponding population among the 14 age groups in Taiwan in February 2023 are shown in Table 1. According to Taiwan's medical-related laws and regulations, dentists must first join the local Dental Association before they can apply for a license from the local government to become a practicing dentist there. In addition, these dentists are also members of TWDA. Therefore, we could estimate the number of practicing dentists in Taiwan from the number of member dentists in TWDA. However, it should be noted that some dentists who are no longer practicing due to retirement or old age may retain their membership in TWDA.

Totally, there were 16,534 dentists in Taiwan in February 2023 (Table 1). The youngest generation of dentists of the 24–29 age group contained 1043 dentists, accounting for 6.31% of the total dentists. The dentists of the 30–34 age group contained the highest number (2057, 12.44%). However, the number of dentists dropped gradually to a relatively lower point (1230, 7.44%) in the 50–54 age group, raised gradually with the increasing age, and reached to another peak (1901, 11.50%) in the 60–64 age group. Then, the numbers of dentists decreased subsequently in the older age groups and finally reached to the lowest point (10, 0.06%) in the greater than 90 age group. Furthermore, the population of the 40–44 age group contained the highest number (2,014,741 people,

accounting for 10.97% of the total population over the age of 24 years), while the number of dentists per 10,000 people was highest in the 30–34 age group (12.86). However, for total population, the number of dentists per 10,000 people was 7.09 (Table 1).

In Taiwan, the dental schools recruit high school graduates and provide a 6-year undergraduate program to award the degree of Doctor of Dental Surgery (DDS).² Therefore, under normal and smooth circumstances, a person has the opportunity to obtain the DDS degree and pass the dentist national examination to become a dentist at the age of 24 years. To the best of our knowledge, Dr. Hsueh-Wan Kwan (1923–2022), who specialized in oral pathology and diagnosis, was still serving patients until the age of 92 years.¹ She was possible the oldest female practicing dentist in Taiwan so far. Our results showed the four bands of change in the age distribution of dentists. First, among the greater than 60 age groups, the number of dentists increased as their age decreased, reaching 11.50% in the 60–64 age group. This reflects the rapid growth of dental graduates entering the workplace after the 1960s. The legally recognized status of dentists in 1975, resulting in the dental profession that was gradually favored by the social value system.¹ Second, among the 50–64 age groups, the number of dentists decreased as their age decreased, reaching 7.44% in the 50–54 age group. This reflects the rethinking of the dental education system in the 1980s, when there was a surplus of dentists, leading to the implementation of enrollment reduction in dental schools.¹ Moreover, in those days, the social atmosphere still preferred the career of physicians, and there were many students who gave up

Table 1 The numbers and their proportions of member dentists of Taiwan Dental Association (TWDA) and corresponding population among the 14 age groups in Taiwan in February 2023.

Age (year)	Dentsits		Population		Number of dentists per 10,000 people
	Number	Ratio (%) ^a	Number	Ratio (%) ^b	
24–29	1043	6.31	1,855,080 (1,340,335) ^c	10.10 (7.30) ^c	5.62
30–34	2057	12.44	1,599,919	8.71	12.86
35–39	2013	12.17	1,663,052	9.05	12.10
40–44	1970	11.91	2,014,741	10.97	9.78
45–49	1727	10.45	1,836,244	10.00	9.41
50–54	1230	7.44	1,769,437	9.63	6.95
55–59	1536	9.29	1,778,970	9.68	8.63
60–64	1901	11.50	1,729,191	9.41	10.99
65–69	1369	8.28	1,496,908	8.15	9.15
70–74	1031	6.24	1,134,017	6.17	9.09
75–79	449	2.72	600,524	3.27	7.48
80–84	154	0.93	470,635	2.56	3.27
85–89	44	0.27	264,363	1.44	1.66
≥90	10	0.06	155,724	0.85	0.64
Overall	16,534	100.00	18,368,805	100.00	–
≤23	–	–	4,944,745	–	–
Total population	–	–	23,313,550	–	7.09

^a Ratio (%) of dentists in this age group to the total dentists.

^b Ratio (%) of population in this age group to the total population over the age of 24 years.

^c The data in brackets refer to the number and proportion of population in the 25–29 age group.

after enrolling a dental school. Third, among the 30–54 age groups, the number of dentists increased as their age decreased, reaching to 12.44% in the 30–34 age group. This indicates the implementation of National Health Insurance (NHI) in 1995, resulting in the increase of income of the dentists and the subsequent recognition of the career of a dentist as a good job by the high school graduates.^{2,3} Fourth, between the 24–29 and 30–34 age groups, the number of dentists in the 24–29 age group was only about half of that in the 30–34 age group. This means that current competition of entering a dental school is fierce and more people retake the university entrance examination for admission to a dental school even though they already have had a degree other than dentistry.⁴ Thus, the age of students entering a dental school is delayed. The relatively higher numbers of dentists per 10,000 people in the 30–34 (12.86) and 35–39 age groups (12.10) may also partially suggest the join of dentists who graduate from foreign dental schools. However, the relatively higher number of dentists per 10,000 people in the 60–64 age group (10.99) indicates that there are more opportunities for admission to a dental school in their young age due to the establishment of 5 dental schools in Taiwan from 1953 to 1960.

Furthermore, according to the statistics of the Ministry of Health and Welfare, there is an average of 465 new-entry dentists per year from 2018 to 2022. However, on average only approximately 110–120 dentists retire each year.⁵ We estimated from this analysis that the average dentist's age was 49.5 years. The age distribution of dentist workforce in Taiwan may shift to the younger age side in the future. In fact, the factors affecting the age distribution of dentist workforce are complex and long-term. Not only the retirement age of dentists and other factors of quitting the job of a dentist, but also the number of dental enrollments, the degree of competition for admission to a dental school, the age of students at enrollment, and the join of dentists graduated from foreign dental schools may affect the

changes in the overall age distribution of dentist workforce in Taiwan. Therefore, it is necessary to establish a mechanism to monitor the age distribution of dentist workforce. The information acquired from that mechanism can further be used as an important basis for dentist manpower planning in the future.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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References

1. Cheng FC, Wang YL, Wang LH, Chang JYF, Liu SY, Chiang CP. Overview of dental education system and gender distribution of undergraduate dental students in Taiwan. *J Dent Sci* 2023;18:420–7.
2. Cheng FC, Lee MC, Wang LH, et al. The current dental school admissions: an overview of the admission process and the geographical distribution of dental school enrollees in Taiwan. *J Dent Sci* 2022;17:1342–9.
3. Chang JYF, Cheng FC, Liu TH, Lin TC, Chang YT, Chiang CP. Distributions of dental freshmen and practicing dentists and their correlations in different regions of Taiwan in 2020. *J Dent Sci* 2021;16:1125–32.
4. Cheng FC, Lee MC, Wang LH, et al. A retrospective study of the admission ways in the school of dentistry of national taiwan university from 2000 to 2021. *J Dent Sci* 2022;17:1577–85.
5. Cheng FC, Chang JYF, Lin TC, Tsai PF, Chang YT, Chiang CP. Does postgraduate year training program for dentists worsen the imbalance of geographical distribution of dentists in Taiwan? *J Dent Sci* 2020;15:542–9.