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Perspective article

The background of Penghu dentists revealed by an interview with a senior local dentist in February 2024

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In Taiwan, currently, there are four major dentist occupation problems: an oversupply of dentists, an uneven distribution of dentists, a concentration of dentists in the metropolitan areas, and a manpower structure dominated by male dentists.^{1,2} Although our government is very concerned about improving the lack of medical resources in the

remote areas and outlying islands, there has been very few studies on the background and composition of medical personnel in these places. By understanding the background of medical personnel in the remote areas and outlying islands and their motivations and factors for serving there, it may help us to formulate better and more effective policies to improve the lack of medical resources in the rural areas. This study was a preliminary attempt to explore the background of practicing dentists in Penghu, an island county of Taiwan.

This study combined the methods of interview and secondary data analysis to find the characteristics of Penghu dentists investigated in February 2024. We interviewed a senior dentist who has been practicing in Penghu for 22 years to explore the background of relationship between Penghu dentists and Penghu, and further used the institution and staff searching system of the Ministry of Health and

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Welfare to confirm their practice registration records. The results are shown in Table 1.

The total number of practicing dentists was 38 in Penghu in February 2024. Of the 38 dentists, there were 28 (73.68%) males and 10 (26.32%) females. For the personal background, there were 18 (47.37%) Penghu locals and 20 (52.63%) non-Penghu locals. The proportion of locals among male dentists (53.57%, 15/28) was higher than that among female dentists (30%, 3/10). For their spouse background, there were 11 (28.95%) dentists whose spouses were Penghu locals, while the other 27 (71.05%) dentists were single or married to non-Penghu locals. The proportion of dentists whose spouses were locals among male dentists (32.14%, 9/28) was higher than that among female dentists (20%, 2/10). However, it should be noted that locals referred to those who grew up in Penghu and at least completed primary school and junior high school there.

For the dentist role, there were 24 (63.16%) proprietor dentists and 14 (36.84%) employed dentists. The proportion of proprietors among male dentists (78.57%, 22/28) was higher than that among female dentists (20%, 2/10). It is worth noting that most dentists with the background of locals were proprietors, while most dentists with the background of non-locals were employees. However, there were also clinical training institutions of post-graduate year training program for dentists (PGYD) in Penghu. These

training institutions usually had a larger number of employed dentists, while their dental trainees usually chose to leave after completing their training. However, it cannot be denied that the training institutions of PGYD and their dentists (including dental trainees) have improved the dental service capacity in Penghu to a certain extent.³

For the status related to tuition funding sources when these Penghu dentists were dental students, there were 3 (7.89%) military expenditure students, 6 (15.79%) publicly funded students, and 29 (76.32%) self-financed students. Among female dentists, there was one publicly funded student but no military expenditure student. According to the contract, publicly funded dentists and military expenditure dentists must be assigned by the government to serve for a certain number of years, and the service locations are usually public health centers or military hospitals in the remote areas and outlying islands. Penghu County has one guaranteed quota of publicly funded student to attend the dental school every year. Currently, these 6 publicly funded dentists (all locals) and 3 military expenditure dentists (all non-locals) were those who stayed there after completing their service in the public health centers or the military hospital of Penghu. Among them, there were 7 proprietor dentists and 2 employed dentists. In fact, many publicly funded dentists chose to leave after completing their service, while more self-financed dental students

Table 1 The characteristics of Penghu dentists investigated in February 2024.

Characteristics of dentists	Male		Female		Total	
	Number	Ratio ^a	Number	Ratio ^a	Number	Proportion ^b
Personal background						
Native Penghu locals	15	83.33%	3	16.67%	18	47.37%
Non-Penghu locals	13	65%	7	35%	20	52.63%
Spouse background						
Native Penghu locals	9	81.82%	2	18.18%	11	28.95%
Single or non-Penghu locals	19	70.37%	8	29.63%	27	71.05%
Dentist role						
Proprietor dentist	22	91.67%	2	8.33%	24	63.16%
Employed dentist	6	42.86%	8	57.14%	14	36.84%
Dental student status						
Military expenditure student	3	100%	0	0	3	7.89%
Publicly funded student	5	83.33%	1	16.67%	6	15.79%
Self-financed student	20	68.97%	9	31.03%	29	76.32%
Practice location						
Magong City	24	72.73%	9	27.27%	33	86.84%
Xiyu Township	2	100%	0	0	2	5.26%
Baisha Township	1	100%	0	0	1	2.63%
Huxi Township	1	50%	1	50%	2	5.26%
Specialized field of dentistry						
General dentist	23	69.70%	10	30.30%	33	86.84%
Specialist with one specialty	3	100%	0	0	3	7.89%
Specialist with two specialties	2	100%	0	0	2	5.26%
Dental specialty certificate						
Oral and maxillofacial surgery	2	100%	0	0	2	28.57%
Family dentistry	3	100%	0	0	3	42.86%
Special needs dentistry	2	100%	0	0	2	28.57%
Overall	28	73.68	10	26.32	38	100%

^a This refers to the gender ratio.

^b This refers to the proportion of each item in the group.

from Penghu stayed in Taiwan to practice directly after graduation from the dental schools.

For the practice locations, there were 33 (86.84%) dentists working in Magong City and 5 (13.16%) dentists working in Xiyu, Baisha, and Huxi townships, indicating that the vast majority of Penghu dentists are concentrated in the urban area. Among the six districts of Penghu, Magong City and Xiyu, Baisha, and Huxi townships are connected by the road transportation. However, Wang-an and Cimei townships are the remote islands of outlying islands. The public health centers in these two townships do not have permanent dentists, and oral care services are usually provided by publicly funded dentists assigned by the government during their contract period. There are currently no publicly funded dentists on duty, so the Kaohsiung Dental Association is responsible for sending dentists there to treat dental patients. The interviewed dentist said that in fact there were already a lot of dentists in Magong City, and now the shortage of dentists was mainly in the remote islands of outlying islands. Unfortunately, when there was no dentist in these islands, the island residents who had toothaches should take a boat to Magong City for dental treatments.

For specialized field of dentistry, there were 33 (86.84%) general dentists and 5 (13.16%) dental specialists. Of the 5 dental specialists, 3 had one specialty and 2 had two specialties. Of the 7 dental specialty certificates, 2 were certificates of oral and maxillofacial surgery, 3 certificates of family dentistry, and 2 certificates of special needs dentistry. However, these 5 dental specialists were all male dentists.

According to statistics from the colonial government during the Japanese colonial period, in 1939, there were 5 dentists in Penghu, accounting for 1.18% (5/424) of all dentists in Taiwan. As of January 2023, there were 36 dentists in Penghu, accounting for 0.22% (36/16,533) of all dentists in Taiwan.⁴ Therefore, the number of dentists in Penghu has grown to reach 7-fold of the original quantity, while that of the whole Taiwan has surged to nearly 40-fold of the original quantity. On the other hand, in 1939, Penghu's population was 68,520 people, accounting for 1.16% of Taiwan's total population (68,520/5,895,864). In addition, the number of dentists per 100,000 people of Penghu was 7.30, while that of Taiwan was 7.19. As of January 2023, Penghu's population is 107,322 people, accounting for only 0.46% of Taiwan's total population (107,322/23,301,968). In addition, the number of dentists per 100,000 people of Penghu was 33.54, while that of Taiwan was 70.95.⁴ This means that after long-term development, with the growth of the number of dentists and the population, Penghu's dental resources are seriously declining compared to the whole Taiwan. Moreover, in 2021, the proportion of female dentists in Taiwan was 30.65% (4860/15,857).⁵ In this study, however, the proportion of female dentists in Penghu was 26.32% (10/38). This means that there are differences in innate conditions between genders. Therefore, it may limit the possibility of female dentists devoting dental services to the remote areas.

We can define "Penghu relationship" in three situations: (1) the person is a Penghu local; (2) his or her spouse is a Penghu local; and (3) the person is contractually obligated to serve in Penghu. In this study, among the dentists with Penghu

relationship in Penghu, 18 were Penghu locals, 11 had spouses who were Penghu locals, and 9 had been contractually obligated to serve in Penghu. However, there were 24 dentists with at least one Penghu relationship, accounting for 63.16% (24/38) of all Penghu dentists. This means that there would be a strong geographical relationship between Penghu and dentists who chose to practice in Penghu.

The interviewed dentist said that most self-financed dental students from Penghu still stayed in urban areas of Taiwan to practice after becoming dentists, while most publicly funded dentists of Penghu also chose to leave after their service period expired. However, compared to other dentists, dentists with connections to Penghu (so-called Penghu relationship as mentioned above) always have a higher chance of returning to their hometowns to practice. Therefore, when considering how to improve the problem of insufficient dental resources in the remote areas and outlying islands, we should increase the opportunities of local students from the remote areas and outlying islands enrolling in the dental schools (such as publicly funded dental students) under the premise of controlling the total number of dentists, or provide incentives to existing dentists to encourage them to practice in the remote areas and outlying islands. This may be the feasible way to improve the problem of insufficient dental resources in the remote areas and outlying islands.^{6–8} However, attempting to train or open more additional quotas of dentists to enter Taiwan's dental market is not a good solution to the problem of insufficient dental resources in the remote areas and outlying islands. On the contrary, this policy may in turn worsen the problems of oversupply and uneven distribution of dentists in Taiwan.

Furthermore, in Taiwan, currently about one-third of dentists had dental specialist qualifications.⁹ However, the proportion of dentists with specialist qualifications in Penghu (13.16%) was much lower, and these dental specialists were all male dentists. This means that dentists (especially female dentists) who have completed dental specialist training in Taiwan are less likely to practice in Penghu than general dentists. Moreover, general dentists in Penghu may lack educational resources for dental specialist training. The problem of insufficient dental education resources in Penghu can be partially solved through participation in the online dentist continuing education by the general dentists in Penghu.¹⁰ Thus, while planning to improve dental resources in the remote areas and outlying islands, it is equally important to improve dental education and training resources for those dentists who have already served in the remote areas and outlying islands in a certain period of time.

Declaration of competing interest

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

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