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Current challenges of the implementation of radiology diagnosis equipment operating license for the dentists in Taiwan

KEYWORDS
Dental X-ray equipment;
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In 1913, the Journal of the Formosan Medical Association published an article titled "the value of X-ray in the diagnosis of dental diseases (with photobook)" from the Taiwan Government Taipei Hospital, proving that dental X-ray machines have been used in clinical practice in Taiwan at least since the 1910s.[1] During the Japanese colonial period (1895–1945), there was a technician, Mr. Sakae Kawahara who worked in the radiology department of the Taiwan Government Tainan Hospital held a technician qualification certificate for the operation of X-ray equipment, indicating that the government at that time may have a certain degree of management system for the operation of X-ray equipment.[2]

Since the end of World War II, Taiwan has gone through a process of government change. It was not until 1973 that the government formulated and promulgated the "Regulations for Medical Ionizing Radiation", which was the earliest regulations on the medical radiation protection control. The operation of the medical radiation equipment by the clinicians officially entered the era of government management. It also clearly stipulated that the dentists engaged in the medical radiation work must undergo ionizing radiation protection training and obtain an operating license before doing so. This model of joint management of medical radiation protection by the health authority and the nuclear safety authority continued until 2002.[3]

In 2002, the Taiwan government enacted and promulgated the "Ionizing Radiation Protection Act". The new radiation protection management regulatory system simplifies the regulations on the operation of radiation equipment. Except that the medical radiation equipment must be operated by the qualified medical personnel, there is no distinction between medical and non-medical radiation protection management. In this regulatory system, since the nominal voltage of dental X-ray machines is lower than 150 kV, the minimum control is adopted. The dentists only need to have completed the 18-h radiation protection training specified by the nuclear safety authority to be qualified to operate dental X-ray machines.[3] This training is authorized to be run by medical schools, civil organizations or private companies. The competent authority only regulates the course content and course hours of this training, as shown in Table 1. Generally speaking, this training course usually takes 2 days to complete. Most dental students usually choose to complete this training before graduation. Thus, they can immediately have the qualifications to operate dental X-ray equipment when they practice.

The current arrangement does not distinguish among radiation uses to plan the course content of the radiation

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Table 1 The course content and course hours of the 18-h radiation protection training in Taiwan.

Item	Course content	Course hours
1	Basic radiation	4
2	Radiation protection	3
3	Radiation application and protection	3
4	Ionizing radiation protection regulations	5
5	Radiation protection internship or observation	3

protection training for specific radiation uses. Therefore, the course content is planned according to general radiation physics knowledge, and there is no radiation protection training course content specifically for the dentistry. In addition, the radiation protection internship can be replaced by observation. Most training organizers do not arrange practical courses, and the entire training is conducted in the form of lectures. Under the current implementation method, the trainees can obtain the legal qualification to operate dental X-ray machines for life after completing 18 h of general radiation protection training. For the dentists, the current system also does not have regulations for regular radiation protection continuing education to renew the operating license. This has an adverse impact on the construction and advancement of the dentists' radiation protection knowledge in the field of dentistry. How to break away from the framework of the current system and strengthen our dentists' concept and professional knowledge of dental radiation protection is a major challenge for current dental education in Taiwan. By teaching the dental students the concept of radiation protection through undergraduate dental radiology course and providing the dentists the new professional knowledge through continuing education, we can break through the limitations of the current system.[4]

This study aimed to explore the implementation of radiology diagnosis equipment operating license for the dentists in Taiwan and to clarify the challenges currently faced by our dentists in developing radiation protection knowledge. In fact, radiation protection is important in dental care and is closely related to the digital transformation of dentistry. In the future, we hope that dental radiation protection will receive more attention, thereby improving the quality of dental care in practice and demonstrating the goal of total-patient care.

Declaration of competing interest

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

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