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**Title:**

Perceptions of oral health education and practice among nursing students in Malaysia and Australia

**Date:**

2021-05-01

**Citation:**

Ahmad, M. S., Abuzar, M. A., Razak, I. A., Rahman, S. A. & Borromeo, G. L. (2021). Perceptions of oral health education and practice among nursing students in Malaysia and Australia. *International Journal of Dental Hygiene*, 19 (2), pp.215-222. <https://doi.org/10.1111/idh.12488>.

**Persistent Link:**

<https://hdl.handle.net/11343/310941>

## TITLE PAGE

### **i. Title of paper:**

Perceptions of oral health education and practice among nursing students in Malaysia and Australia

### **ii. Short title:**

Oral health education, practice and nursing

### **iii. Key words:**

Education, nursing, dental hygiene, oral hygiene

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This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.1111/IDH.12488](https://doi.org/10.1111/IDH.12488)

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**vi. Acknowledgements:**

The study was funded by the Melbourne Dental School Postgraduate Research Grant. The authors wish to thank Professor Dr. Che An Ahmad and Ms Eileen Wilton for assisting in the development of the survey.

**vii. Declaration of interest**

The authors report no declarations of interest.

**viii. Data availability statement**

The data is kept in a locked facility in Melbourne Dental School, and will be made available up to 5 years after the last publication. Access to the data is by relevant investigators only, unless required by law.

**ix. Clinical relevance**

Scientific rationale for study: Empowering nurses with roles in collaborative oral health (OH) care is a feasible approach to promoting attainment of systemic health and general wellbeing.

Principal findings: While OH issues are commonly encountered in their practice settings, Malaysian and Australian nursing students reported inadequate training in certain areas, with many indicating discomfort in referring patients to dental professionals. However, most students cited positive attitudes and beliefs in the role of nurses in OH provision.

Practical implications: This study highlights areas that require further enhancement in order to adequately equip the future nurses for their roles in OH care.

Article type : Original Article

## **Perceptions of oral health education and practice among nursing students in Malaysia and Australia**

**Objective:** Representing the largest proportion of health care workers, nurses play a significant role in oral health (OH) maintenance as part of a larger effort to promote holistic patient care. The study aims to determine nursing students' perceptions of OH education and practice in Malaysian and Australian nursing schools. **Materials and methods:** A self-administered questionnaire (content- and face-validated) survey was undertaken, classroom style, amongst final-year nursing students from selected Malaysian (n=122, Response rate=97.6%) and Australian (n=299, Response rate=54.7%) institutions. Quantitative data was analysed via Statistical Package for Social Science software (Chi-square and Fisher's exact tests,  $P \leq 0.01$ ). **Results:** Significantly more Malaysian nursing students, compared to those in Australia, reported having encountered patients with OH issues (98.4% vs. 82.9%), namely halitosis (87.7% vs. 62.2%), oral ulcers (63.1% vs. 41.1%), oral/dental trauma (36.9% vs. 21.1%) and caries in children (28.7% vs. 7.7%). Less than half of Malaysian and Australian nursing students reported that they received adequate OH training (48.4% vs. 36.6%,  $p \leq 0.01$ ), especially in detecting oral cancer (18.0.0% vs. 22.6%,  $p \leq 0.01$ ) and preventing oral diseases (46.7% vs. 41.7%,  $p \leq 0.01$ ). Students in both countries demonstrated positive attitudes and believed in their role in OH care. Most students agreed that they should receive training in OH, especially in smoking cessation and providing OH care for patients with special needs. They also opined that a standardised evidence-based oral hygiene protocol is needed. **Conclusion:** Support for education and practice in this area of patient care suggested positive implications for further development of nurses' roles in OH promotion and management.

**Keywords:** Education, nursing, dental hygiene, oral hygiene

**Introduction:**

Alongside oral health professionals, other members of the multidisciplinary team who play a vital role in oral health care and promotion include registered nurses.<sup>1</sup> This group of healthcare workers play an important role in assessing, planning, implementing and evaluating a patient's nursing care, including aspects relating to maintenance of personal hygiene, dietary intake and health-related behaviour or lifestyle.<sup>2-4</sup> As the largest group of health care workers, nurses are given significant access to patients and the larger community, allowing them to widely improve oral health care within the scope of their professional practice.<sup>5</sup>

The involvement of registered nurses is highly important, especially with regard to patients who have special health care needs and may experience difficulty in maintaining daily oral hygiene care and accessing professional dental services.<sup>6</sup> Access to patients' health care plans and close involvement in their daily living activities provides nurses with opportunities to integrate oral health care with other nursing responsibilities.

In Malaysia, most registered nurses practice in a variety of medical fields in both hospital and community clinics, with approximately two-thirds working in the public sector.<sup>5</sup> In Australia, registered nurses practice in hospitals, residential care facilities and long-term care institutions, managing medically compromised and elderly people as well as individuals with disabilities.<sup>2</sup> The high utilisation of non-dental healthcare services for oral health-related concerns,<sup>7,8</sup> including those provided by registered nurses,<sup>9,10</sup> further highlights their role in collaborative oral health care.

However, lack of knowledge, attitudes and practice in oral health demonstrated by nurses may limit their involvement with these components of nursing care.<sup>11</sup> It has also been perceived by patients and/or caregivers that nurses have inadequate skills and poor attitudes when providing care and support in oral hygiene maintenance.<sup>12</sup>

In order to prepare registered nurses to practise as competent providers and promoters of oral health, adequate training in oral health care is integral. Students' perceptions of the current extent of training and its effectiveness need to be assessed to aid curricular enhancement that aims to prepare future practitioners with sound knowledge, clinical competence and positive attitudes in collaborative oral health care. This study investigated the perceptions of undergraduate nursing students regarding their educational experience in provision of oral health and described the future implications for teaching and learning in this area of health care practice across Malaysia and Australia.

### **Materials and methods:**

This descriptive, quantitative, cross-sectional study used a self-administered questionnaire, distributed classroom style, on final-year undergraduate nursing students from specific institutions in Malaysia and Australia to determine their perceptions of oral

health education, learning experiences in oral health, as well as comfort and beliefs in undertaking activities relating to oral health promotion and provision of care.

The University A Human Research Ethics Committee (HREC ID: 1136596) and the Research Ethics Committee at the University B (Ref No: 600-RMI [5/1/6]) granted ethical approval for the study.

### ***Study population***

This study involved all final-year undergraduate nursing students attending selected Malaysian public nursing institutions and Australian nursing schools. Having completed most of their nursing program requirements, final-year students were specifically targeted to gain an overview of their learning experience.

Selection of Malaysian and Australian study population was based on the establishment status of the nursing school, similar to that performed in another study.<sup>13</sup> In this study, an 'established' Malaysian nursing school is one with a nursing program running for more than 10 years. The Malaysian study population is further divided into those from institutions with and without a co-existing dental school, giving rise to groups of final-year nursing students belonging to four different categories: 1) A nursing school with 10 or more years of establishment with an associated dental school; 2) A nursing school with 10 or more years of establishment without an associated dental school; 3) A nursing school with less than 10 years of establishment with an associated dental school; and 4) A nursing school with less than 10 years of establishment without an associated dental school.

On the other hand, an 'established' Australian nursing school in this study is one that constitutes the Group of Eight Universities.<sup>14</sup> Therefore, Australian study population in this study included final-year nursing students who attended one of two selected nursing institutions, divided based on these criteria: 1) A nursing school from a Group of Eight university or 2) A nursing school from a non-Group of Eight university.

### ***Study instrument***

A self-administered questionnaire was used as the study instrument. The questionnaire utilised in the survey was developed based on existing literature,<sup>15-19</sup> and modified to suit the local conditions. The seven-page questionnaire consisted of five sections: 1) Section A: Socio-demographic characteristics; 2) Section B: Students' experience, comfort, beliefs and attitudes in providing oral health care; 3) Section C: Students' perception of current training in oral health; 4) Section D: Students' perception of future training in oral health; and 5) Section E: Knowledge of special needs dentistry.

Students were required to indicate their responses towards a list of items based on a 5-point Likert scale for Section B and C. In Section D, students were asked to identify oral health-related learning areas perceived as important for nursing studies by indicating 'yes' or 'no' to a list of oral health-related learning topics. Students' knowledge of special needs dentistry was measured in Section E based on their ability to identify the groups of individuals who require intervention by an oral health professional specialising in this field of dentistry according to the definitions established by the Royal Australasian College of Dental Surgeons. This list of patient categories included those with intellectual disabilities, complex medical conditions, physical disabilities and psychiatric issues.<sup>20</sup>

Prior to the main survey, the questionnaire underwent content validation by a panel of senior Malaysian nursing academics and senior Australian nursing staff. A pilot study (face validation) was conducted on a group of Malaysian (n=10) and Australian (n=5) nursing students, as well as registered nurses practicing in Malaysia (n=7) and Australia (n=7). Appropriate modifications were made to the questionnaire before it was utilised in the main survey.

### ***Administration and data collection***

Prior to data collection, written permission was obtained from the deans or heads of the respective nursing institutions to conduct the questionnaire during class time. The survey was conducted classroom style for 15 minutes in the lecture theatre on the permitted dates. The survey was administered during April 2015 and July 2015 for the Malaysian and Australian subjects, respectively. This timing was chosen to ensure that students had undergone most components of undergraduate nursing training to effectively reflect their responses to the questions asked in the survey. A 'plain language statement' providing the participants with information about the study's objectives as well as issues regarding confidentiality, voluntary participation and consent was attached together with the questionnaire. Malaysian subjects were also supplied with a 'subject information sheet', and those who agreed to participate in the study were asked to complete a consent form. Each questionnaire was enclosed in an envelope to protect the subjects' anonymity and confidentiality, as both respondents and non-respondents. The questionnaires were returned

using the enclosed envelopes at the end of the questionnaire-answering session. An unanswered or unreturned questionnaire was considered refusal to participate.

### **Data entry and analysis**

Quantitative data were analysed via Chi-square and Fisher's exact tests using the Statistical Package for Social Science (SPSS) software version 22.0 (SPSS Inc., Chicago, IL, USA), with significance taken at  $P \leq 0.01$ . Comparisons were drawn to identify any significant differences in students' responses between both countries. Malaysian nursing schools with programs conducted for more than 10 years and Australian institutions who were members of the Group of Eight Universities<sup>14</sup> were classified as 'established'.

### **Results:**

#### ***Sociodemographic characteristics:***

There was no Malaysian nursing school that fulfilled criteria number 2 (an established nursing school without a co-existing dental school). Other selected Malaysian nursing schools (n=3) allowed permission for their students to be approached for the survey. Meanwhile, only one Australian nursing institution agreed to participate.

The response rate was 97.6% (n=122) and 54.7% (n=299) for Malaysian and Australian students, respectively. There were more female than male students in Malaysia (92.6% vs. 7.4%) and Australia (82.3% vs. 17.7%).

#### ***Students' experience of encountering patients with oral health issues:***

Significantly more Malaysian nursing students reported having encountered patients with oral health issues compared to students in Australia (98.4% vs. 82.9%;  $\chi^2=18.716$ ,  $p \leq 0.01$ ). The majority of students in Malaysia and Australia were exposed to patients presenting with halitosis (87.7% vs. 62.2%;  $\chi^2=26.622$ ,  $p \leq 0.01$ ) and edentulism (69.7% vs. 57.5%). In comparison with their Australian counterparts, Malaysian students also reported significantly higher encounters with patients who had oral ulceration (63.1% vs. 41.1%;  $\chi^2=16.782$ ,  $p \leq 0.01$ ), oral and/or dental trauma (36.9% vs. 21.1%;  $\chi^2=11.363$ ,  $p=0.001$ ) and children with caries (28.7 vs. 7.7%;  $\chi^2=32.156$ ,  $p \leq 0.01$ ) (Figure 1).

#### ***Students' comfort level in undertaking oral health activities:***

The majority of Malaysian and Australian students felt comfortable providing oral hygiene instruction (77.5% vs. 68.9%, respectively) and conducting oral examinations (52.4% vs. 51.6%), but not in deciding whether dental referral was required (42.5% vs. 43.0%;  $\chi^2=11.297$ ,  $p=0.004$ ). Among the Malaysian respondents, in terms of their level of

comfort in undertaking these oral health activities, there were no significant differences ( $p>0.01$ ) in the percentage of students from institutions with a co-existing dental school when compared with their counterparts. There were also no significant differences in the percentage of Malaysian students from an established nursing school, in comparison with those studying in less established institutions, in similar aspects ( $p>0.01$ ).

#### ***Students' beliefs about the role of nurses in oral health care:***

Most students from both countries believed that nurses played an important role in oral health care. These roles included educating patients about the effects of diet on oral health (94.3% Malaysian vs. 74.7% Australian;  $\chi^2=21.425$ ,  $p\leq 0.01$ ), advising patients to obtain regular dental check-ups (89.3% Malaysian vs. 71.6% Australian;  $\chi^2=15.728$ ,  $p\leq 0.01$ ), undertaking routine oral screening (86.9% Malaysian vs. 67.4% Australian;  $\chi^2=17.141$ ,  $p\leq 0.01$ ) and providing advice on oral hygiene procedures (86/1% Malaysian vs. 72.1% Australian;  $\chi^2=12.391$ ,  $p=0.002$ ). Most students from both countries believed they should be trained to apply fluoride varnish on teeth of patients with a high risk of developing caries (55.4% Malaysian vs. 51.4 Australian;  $\chi^2=14.241$ ,  $p=0.001$ ). Among the Malaysian respondents, there were no significant differences in the percentage of students with beliefs about their various roles in oral health care, whether or not they come from an established nursing school ( $p>0.01$ ) or institutions with a co-existing dental school ( $p>0.01$ ).

#### ***Students' attitudes regarding oral health provision:***

Most students believed that provision of oral hygiene care was a high priority (79.5% Malaysian vs. 74.7% Australian) and that it had a significant impact on patients' clinical outcomes (86.9% Malaysian vs. 82.2% Australian). Although almost half of the students in Malaysia (44.3%) and Australia (50.0%) felt that cleaning the oral cavity was difficult, only a small percentage thought it was an unpleasant task (15.6% Malaysian vs. 34.3% Australian;  $\chi^2=19.238$ ,  $p\leq 0.01$ ). Among the Malaysian respondents, there were no significant differences in the percentage of students from institutions with a co-existing dental school, in comparison with their counterparts, in terms of their attitudes towards the various aspects of oral health care ( $p>0.01$ ). There were also no significant differences in the percentage of Malaysian students from an established nursing school, in comparison with those studying in less established institutions, in similar areas ( $p>0.01$ ).

#### ***Students' perceptions of current training in oral health:***

Overall, less than half of the students in both countries felt that they received adequate training in oral health (48.4% Malaysian vs. 36.6% Australian;  $\chi^2=17.584$ ,  $p\leq 0.01$ ). There were no significant differences in the percentages of Malaysian students with this

response, regardless of whether they came from an institution that is established ( $p>0.01$ ) or has a co-existing dental school ( $p>0.01$ )

A significantly higher proportion of students in Malaysia reported that they received good training in performing oral hygiene procedures on patients (91.0% vs. 68.7%;  $\chi^2=24.460$ ,  $p\leq 0.01$ ), giving oral hygiene instruction (84.4% vs. 64.9%;  $\chi^2=15.768$ ,  $p\leq 0.01$ ), undertaking basic oral examination (68.9% vs. 51.9%;  $\chi^2=14.915$ ,  $p=0.001$ ) and providing smoking cessation advice (57.0% vs. 46.2%;  $\chi^2=9.646$ ,  $p=0.008$ ). However, less than half the students in both countries felt that their training in advising patients about diet and oral disease prevention (46.7% Malaysian vs. 41.7% Australian;  $\chi^2=9.385$ ,  $p=0.009$ ) as well as detecting oral cancerous lesions (18.0% Malaysian vs. 22.6% Australian;  $\chi^2=36.425$ ,  $p\leq 0.01$ ) was good. Among the Malaysian respondents, there were no significant differences in the percentage of students from institutions with a co-existing dental school, in comparison with their counterparts, in terms of their perceptions of the quality of training that they received in the various oral health-related areas mentioned ( $p>0.01$ ). There were also no significant differences in the percentage of Malaysian students from an established nursing school, in comparison with those studying at less established institutions, in similar aspects ( $p>0.01$ ).

Students also felt that they needed more information regarding evidence-based oral care standards (75.4% Malaysian vs. 67.0% Australian). There were no significant differences in the percentages of Malaysian respondents with this response in terms of the establishment status of their institution ( $p>0.01$ ) or whether a dental school was present within the same university ( $p>0.01$ ).

### ***Students' perceptions of future training in oral health:***

Almost all nursing students in Malaysia (99.2%) and Australia (91.2%) agreed that oral health should be taught to nursing students ( $\chi^2=8.880$ ,  $p=0.002$ ). There were no significant differences in the percentages of Malaysian students with this response in terms of the establishment status of their institutions or whether a dental school was present within the same university.

Oral health-related topics considered important by nursing students are presented in Figure 2. Over 80% of nursing students from both countries indicated the importance of instruction in the oral care of patients as components of the intensive or critical care unit as well as smoking and its impact on oral health, the effects of poor oral health on systemic health and conducting basic oral examinations in adults.

### ***Awareness of Special Needs Dentistry:***

Only a small percentage of students in Malaysia (40.2%) and Australia (28.1%) were aware of Special Needs Dentistry as a dental specialty. There were no significant

differences in the percentages of Malaysian students citing such responses, regardless of whether they came from an established institution or there was a co-existing dental school present.

Nevertheless, the majority of students were able to identify patients requiring a Special Needs Dentistry intervention as those with physical impairments (77.0% Malaysian vs. 73.9% Australian), complex medical conditions (68.0% Malaysian vs. 76.1% Australian), intellectual disabilities (57.4% Malaysian vs. 67.0% Australian) and psychiatric disorders (52.5% Malaysian vs. 62.3% Australian).

### **Discussion:**

This study examined students' perceptions of oral health training as a component of their undergraduate curriculum and of their clinical role in oral health care. Australia was chosen as a comparison for Malaysia in this study, as the former is recognised as one of the world's best providers of health care education and services.<sup>21,22</sup>

This study found that the training of Malaysian and Australian nursing students in areas related to oral health care was perceived as inadequate. In Malaysia, the lack of such training was expressed even among those who were studying in an established institution or university with a co-existing dental school. Such perceptions are consistent with a previous study that reported a lack of structured oral health training in the nursing curricula of both countries.<sup>13</sup> It was also previously noted that there was no specific or compulsory requirements to assess nursing students' knowledge and skills in oral health care, thereby compromising their learning commitments.<sup>13</sup> Inter-faculty collaboration between dental and nursing schools was also perceived as non-existent, while some institutions faced various challenges in delivering a well-structured educational program in this area of patient care.<sup>13</sup>

Despite the lack of training, it was evident in the study that nursing students from both countries demonstrated beliefs, comfort and positive attitudes towards oral health care. Such characteristics, which were collectively described, provide a promising insight into the training of future nurses learning to become effective collaborators in oral health care. It is therefore necessary that dental schools play a more proactive and timely role in assisting their nursing counterparts in conducting such training. Collaboration among universities, especially between established and non-established institutions as well as those with and without an affiliated dental school, may help with sharing of resources, expertise and facilities to conduct effective educational activities.

In this study, the exposure of students to patients presenting with oral health conditions indicates opportunities for training in this area of health care practice. It was evident that nursing students experienced managing patients who presented with oral health conditions necessitating further attention. The high percentage of nursing students who

reported having encountered patients with oral health conditions in this study was comparable to that reported by their medical counterparts.<sup>15</sup> It was observed that the most common oral health conditions encountered by medical and nursing students in both countries were halitosis, ulcer and edentulism.<sup>15</sup> Higher numbers of encounters were reported amongst Malaysian subjects and may be linked to the population's high prevalence of oral diseases, including caries, periodontal disease, oral-mucosal lesion and orofacial trauma.<sup>23</sup> Nurses' encounters with patients presenting with oral health conditions indicate their important position in triage and long-term maintenance; however, as not many nursing students in this study felt comfortable deciding on when or how to refer for dental management, oral health conditions may thus be inappropriately managed, leading to further deterioration and other sequelae. Similar discomfort was reported by their medical counterparts and may further place patients at risk of mismanagement, especially in communities where medical practitioners and/or nurses may be the only available healthcare providers.<sup>15,24,25</sup>

In Australia, it is a legal obligation for managers of residential care facilities to provide timely access to oral health care professionals for residents who present with oral health conditions (Schedule 2, Part 2 (2.15) of the Quality and Care Principles 2014; Part 4.1, Division 54 (54-1), Aged Care Act 1997).<sup>26,27</sup> To allow for efficient referral, nurses should be able to perform an oral examination and recognise oral conditions that require a dental professional's intervention. The nurse's role in performing an oral examination and arranging for appropriate referral is vital, especially in nursing care facilities in both countries where access to and availability of dentists is limited.<sup>28,29</sup>

The lack of training in oral cancer detection reported by Malaysian and Australian students in this study was similar to that reported in other parts of the world.<sup>30,31</sup> Similarly, a lack of knowledge regarding oral cancer management was also noted by medical students, practitioners and specialists in both countries and elsewhere.<sup>15,32,33</sup> To achieve better prognoses and prolonged survival,<sup>34</sup> training in oral cancer screening is important so that nurses, alongside other members of the healthcare team, can facilitate early detection and prompt referral. The role of nurses in this area of patient care is especially crucial when considering the deficit of oral health professionals in rural areas of both countries,<sup>24,25</sup> where oral cancer was reported to be highly prevalent.<sup>35,36</sup>

Another important area in oral health care is daily oral hygiene maintenance. In Australia, provision of oral and dental care constitutes a component for accreditation of residential care conditions (Schedule 2, Part 2 (2.15) of the Quality and Care Principles 2014; Part 4.1, Division 54 (54-1), Aged Care Act 1997).<sup>26,27</sup> However, it was evident in this study that there were still some nursing students in Australia who believed that they did not have good training in performing and providing advice on oral hygiene procedures. With the

global rise in the number of elderly people as well as those living with disabilities and complex medical conditions,<sup>37,38</sup> the role of nurses in performing daily oral hygiene care is becoming increasingly important. Nurses' assistance in maintaining regular oral hygiene care is vital to reduce the risk of life-threatening illnesses associated with poor oral hygiene, such as aspiration pneumonia, diabetes mellitus and cardiovascular diseases.<sup>39,40</sup> Patients with such health risks, while being highly dependent on assistance in maintaining daily oral hygiene care, include those who are unconscious, mechanically ventilated, tube-fed and cognitively impaired.<sup>39</sup>

Teaching of oral hygiene care must be done with respect to evidence-based practice, especially when it relates to the use of appropriate physical and chemical materials as well as efficient techniques and frequency in performing the procedure. However, the materials relating to oral health care in nursing textbooks was found to be minimal, with obsolete and invalid information.<sup>41</sup> Some nurses also demonstrated oral hygiene practices that may not have been evidence-based.<sup>42</sup> Evidence-based oral hygiene protocol or standards in nursing education and practice should be developed, as suggested by students in this study, to ensure the quality of teaching content and the standard of nursing practice.

Support for training in fluoride varnish application demonstrated by most students in both countries indicates a positive implication for the future roles of nurses in providing such care. However, application of fluoride varnish by nurses in Malaysia may be restricted by legislative guidelines that only permit a dentist and a dental hygienist to undertake such activity on high-risk individuals.<sup>43</sup> Nevertheless, similar restrictions do not apply in Australia, where fluoride varnish application is permitted for any health care professionals, including registered nurses.<sup>44</sup> Enhancing nurses' role in applying fluoride varnish on a routine basis requires in-depth evaluation of its short- and long-term impact and benefits to individuals, populations, the health care profession and the country's economy.

Regardless of the specific health care setting, management of patients with special health care needs involves multidisciplinary intervention to address their unique health care needs and promote comprehensive approaches to patient care. Such management involves close liaison with oral health professionals, including Special Needs Dentistry specialists, who are responsible in treating patients with medical conditions and disabilities.<sup>20</sup> Inadequacies in terms of students' awareness of Special Needs Dentistry indicates the need for an enhanced effort in developing opportunities for interprofessional learning and practice between the nursing and dental professions as well as other healthcare areas whose practitioners also experienced a lack of oral health training during their undergraduate or predoctoral studies.<sup>45,46</sup> In addition, collaboration with their oral health counterparts may help with reviewing policies in program accreditation, the scope of practice and institutional practice guidelines that emphasise the roles of nurses, as part of the multidisciplinary team,

in oral health maintenance and in light of the current global standards in healthcare education and practice.

This study is limited by the lack of nursing schools from Australia that responded to our request to have their students participate in this study. As such, the Australian study samples did not truly represent the study population in its entirety. For future research, a multi-centre collaboration that includes a representative from each nursing school is recommended to encourage participation from more institutions. Applying a more strategic and systematic approach to sampling of subjects is also important to obtain results that are representative of the study population.

Students' support for oral health education and practice indicates positive implications for further development of initiatives that are aimed at empowering the role of nurses in this area of patient care. Perspectives of the study cohort with respect to training of future nurses in oral health form an important basis for the planning and formulation of nursing curriculum and practice guidelines for both countries.

### **Conclusion:**

Undergraduate education in oral health care is important. It can potentially provide a unique learning experience for future nurses to enhance their effective role in oral health maintenance within a multidisciplinary setting. Students' perception of the quantity and quality of training received in this area of practice can provide important information for curriculum design. Support for training in oral health care demonstrated by nursing students suggested positive implications for further development in oral health education and practice for future nursing professionals in Malaysia and Australia.

### **Acknowledgments**

The study was funded by University A Research Grant. The authors wish to thank Professor CAA and Ms. EW for assisting in the development of the survey.

### **Declaration of interests**

The authors report no conflicts of interest.

### **References:**

1. Garry B, Boran S. Promotion of oral health by community nurses. Br J Community Nurs 2017;22(10):496-502.

2. Nursing and Midwifery Board of Australia. Registered nurses standards for practice. Melbourne: Australian Health Practitioner Regulation Agency; 2016.
3. Australian Health Practitioner Regulation Agency. Approved programs of study. Australian Health Practitioner Regulation Agency. <https://www.ahpra.gov.au/education/approved-programs-of-study.aspx>. Published 2020. Accessed Aug 16, 2020.
4. Nursing Education Task Force. Development of nursing education in Malaysian towards the year 2020. Shah Alam: Ministry of Higher Education Malaysia; 2010.
5. Australian Government Department of Health. Health workforce summaries. Commonwealth of Australia. <https://hwd.health.gov.au/summary.html#part-2>. Published 2019. Accessed Aug 16, 2020.
6. Vozza I, Cavallè E, Corridore D, et al. Preventive strategies in oral health for special needs patients. *Annali di stomatologia* 2016;6(3-4):96-9.
7. Cope AL, Wood F, Francis NA, Chestnutt IG. Patients' reasons for consulting a GP when experiencing a dental problem: a qualitative study. *Br J Gen Pract* 2018;68(677):e877-e83.
8. Cope AL, Wood F, Francis NA, Chestnutt IG. General practitioners' attitudes towards the management of dental conditions and use of antibiotics in these consultations: a qualitative study. *BMJ Open* 2015;5(10):e008551-e.
9. Baginska J, Rodakowska E, Milewski R, Wilczynska-Borawska M, Kierklo A. Polish school nurses' knowledge of the first-aid in tooth avulsion of permanent teeth. *BMC Oral Health* 2016;16(1):30.
10. Sari SA, Halabi MA, Kowash M, Hussein I. Emergency management of traumatic Dental injuries: knowledge of Dubai school nurses. *Pesquisa Brasileira em Odontopediatria e Clínica Integrada* 2019;19.
11. Tham R, Hardy S. Oral healthcare issues in rural residential aged care services in Victoria, Australia. *Gerodontology* 2013;30(2):126-32.
12. Horne M, McCracken G, Walls A, Tyrrell P, Smith C. Organisation, practice and experiences of mouth hygiene in stroke unit care: a mixed-methods study. *J Clin Nurs* 2015;24(5-6):728-38.
13. Ahmad MS, Abuzar MA, Razak IA, Rahman SA, Borromeo GL. Oral health education in the undergraduate nursing curriculum of Australian and Malaysian institutions. *Eur J Dent Educ* 2020 [Epub ahead of print] <https://doi.org/10.1111/eje.12611>.
14. Group of Eight Australia. About the Go8. The Group of Eight Ltd. <https://go8.edu.au/about/the-go8>. Published 2020. Accessed Sept 10, 2020.

15. Ahmad MS, Abuzar MA, Razak IA, Rahman SA, Borromeo GL. Oral health education for medical students: Malaysian and Australian students' perceptions of educational experience and needs. *J Dent Educ* 2017;81(9):1068-76.
16. Chan EY, Hui-Ling Ng I. Oral care practices among critical care nurses in Singapore: a questionnaire survey. *Appl Nurs Res* 2012;25(3):197-204.
17. Binkley C, Furr LA, Carrico R, McCurren C. Survey of oral care practices in US intensive care units. *Am J Infect Control* 2004;32(3):161-9.
18. Rabiei S, Mohebbi SZ, Patja K, Virtanen JI. Physicians' knowledge of and adherence to improving oral health. *BMC Public Health* 2012;12:855.
19. AlYousef Y, Damiano P, Weber-Gasparoni K, Qian F, Murph J, Nothwehr F. Medical students' child oral-health-related knowledge, practices and attitudes. *Eur J Dent Educ* 2013;17(4):218-24.
20. Royal Australasian College of Dental Surgeons. Specialist Dental Practice. Royal Australasian College of Dental Surgeons.  
[https://www.racds.org/RACDSNEW\\_Content/Education/Specialist\\_Dental\\_Practice.aspx](https://www.racds.org/RACDSNEW_Content/Education/Specialist_Dental_Practice.aspx). Published 2019. Accessed Aug 16, 2020.
21. Schneider EC, Sarnak DO, Squires D, Shah A, Doty MM. *Mirror, mirror 2017: International comparison reflects flaws and opportunities for better U.S. health care*. New York: The Commonwealth Fund;2017.
22. Times Higher Education. World University Rankings 2020 by subject: clinical, preclinical and health. THE World Universities Insights Limited.  
[https://www.timeshighereducation.com/world-university-rankings/2020/subject-ranking/clinical-pre-clinical-health#!/page/0/length/25/sort\\_by/rank/sort\\_order/asc/cols/stats](https://www.timeshighereducation.com/world-university-rankings/2020/subject-ranking/clinical-pre-clinical-health#!/page/0/length/25/sort_by/rank/sort_order/asc/cols/stats). Published 2020. Accessed Aug 16, 2020.
23. Oral Health Division, Ministry of Health Malaysia. National Oral Health Survey of Adults 2010. Putrajaya: Oral Health Division, Ministry of Health, Malaysia;2013.
24. Md Bohari NF, Kruger E, John J, Tennant M. Analysis of dental services distribution in Malaysia: a geographic information systems – based approach. *Int Dent J* 2019;69(3):223-9.
25. Australian Government, Federal Register of Legislation. Dental workforce. Commonwealth of Australia.  
[https://www1.health.gov.au/internet/publications/publishing.nsf/Content/report\\_nacdh~report\\_nacdh\\_ch2~report\\_nacdh\\_wf](https://www1.health.gov.au/internet/publications/publishing.nsf/Content/report_nacdh~report_nacdh_ch2~report_nacdh_wf). Published 2020. Accessed Aug 16, 2020.
26. Australian Government Federal Register of Legislation. Quality of Care Principles 2014. Australian Government Federal Register of Legislation.

- <https://www.legislation.gov.au/Details/F2019C00063>. Published 2019. Accessed Aug 16, 2020.
27. Australian Government Federal Register of Legislation. Aged Care Act 1997. Australian Government Federal Register of Legislation. <https://www.legislation.gov.au/Details/C2020C00164>. Published 2020. Accessed Aug 16, 2020.
  28. Hopcraft MS, Morgan MV, Satur JG, Wright FA. Dental service provision in Victorian residential aged care facilities. *Aust Dent J* 2008;53(3):239-45.
  29. Othman AA, Yusof Z, Saub R. Malaysian government dentists' experience, willingness and barriers in providing domiciliary care for elderly people. *Gerodontology* 2014;31(2):136-44.
  30. Pai RR, Ongole R. Nurses' knowledge and education about oral care of cancer patients undergoing chemotherapy and radiation therapy. *Indian J Palliat Care* 2015;21(2):225-30.
  31. Mittal S, Mahuli A, Hiregoudar M, Mohandas SRU, Natraj PGMCG. Knowledge of oral cancer and screening practice of B.Sc. nursing students in Davangere City, India. *J Educ Ethics Dent* 2013;3(1):40-3.
  32. Carter LM, Ogden GR. Oral cancer awareness of general medical and general dental practitioners. *Br Dent J* 2007;203(5):E10; discussion 248-9.
  33. Applebaum E, Ruhlen TN, Kronenberg FR, Hayes C, Peters ES. Oral cancer knowledge, attitudes and practices: a survey of dentists and primary care physicians in Massachusetts. *J Am Dent Assoc* 2009;140(4):461-7.
  34. Awan K. Oral Cancer: Early Detection is Crucial. *J Int Oral Health* 2014;6(5):i-ii.
  35. Pollaers K, Kujan O, Johnson NW, Farah CS. Oral and oropharyngeal cancer in Oceania: Incidence, mortality, trends and gaps in public databases as presented to the Global Oral Cancer Forum. *Translational Research in Oral Oncology* 2017;2:1-8.
  36. Cheong SC, Patravoot V, Yi-Hsin Y, Zain R, Kerr AR, Johnson N. Oral cancer in South East Asia: Current status and future directions. *Translational Research in Oral Oncology* 2017;2:1-9.
  37. World Health Organization. World report on disability. Geneva: World Health Organization;2011.
  38. Divo MJ, Martinez CH, Mannino DM. Ageing and the epidemiology of multimorbidity. *Eur Respir J* 2014;44(4):1055-68.
  39. Son YG, Shin J, Ryu HG. Pneumonitis and pneumonia after aspiration. *J Dent Anesth Pain Med* 2017;17(1):1-12.
  40. Alpert P. Oral health: the oral-systemic health connection. *Home Health Care Management and Practice* 2017;29(1):56-9.

41. Jablonski RA. Oral health and hygiene content in nursing fundamentals textbooks. *Nurs Res Pract* 2012;2012:372617.
42. Cohn JL, Fulton JS. Nursing staff perspectives on oral care for neuroscience patients. *J Neurosci Nurs* 2006;38(1):22-30.
43. Workgroup on Use of Fluorides, Oral Health Division, Ministry of Health Malaysia. Position document: Use of fluorides in Malaysia. Putrajaya: Malaysian Dental Council;2009.
44. Do LG. Guidelines for use of fluorides in Australia: update 2019. *Aust Dent J* 2020;65(1):30-8.
45. Ahmad MS, Abuzar MA, Razak IA, Rahman SA, Borromeo GL. Educating medical students in oral health care: current curriculum and future needs of institutions in Malaysia and Australia. *Eur J Dent Educ* 2017;21(4):e29-e38.
46. Omar S. Health professional students' understanding of oral health in traumatic brain injury [Master thesis]. Ontario: Faculty of Health Sciences, University of Western Ontario; 2018.

## FIGURE LEGENDS

Figure 1. Oral presentations in patients encountered by nursing students (Black Boxes = Malaysia, Grey boxes = Australia).

Note: \*  $p \leq 0.01$

Figure 2. Oral health-related topics perceived as important for nursing students to learn (Black Boxes = Malaysia, Grey boxes = Australia; \*  $p \leq 0.01$ ).

Note: ICU=intensive care unit; CCU=critical care unit; OH=oral health; H&N=head and neck; BMT=bone marrow transplant; SHCN=special health care needs.

Figure 1

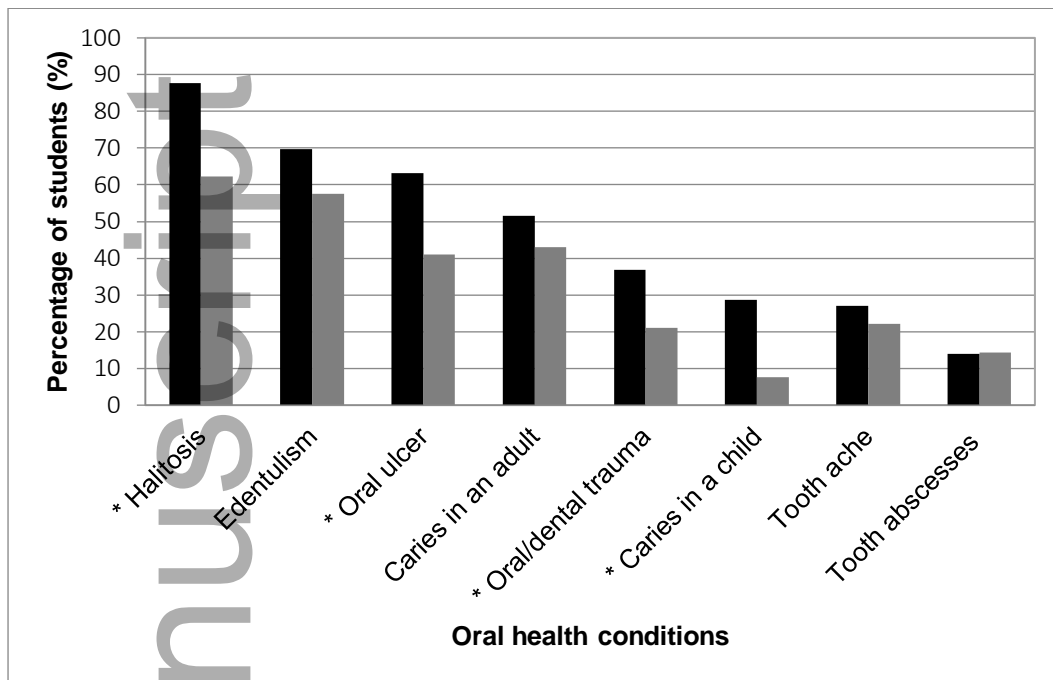


Fig. 1. Oral presentations in patients encountered by nursing students (Black Boxes = Malaysia, Grey boxes = Australia).

Note: \*  $p \leq 0.01$

Figure 2

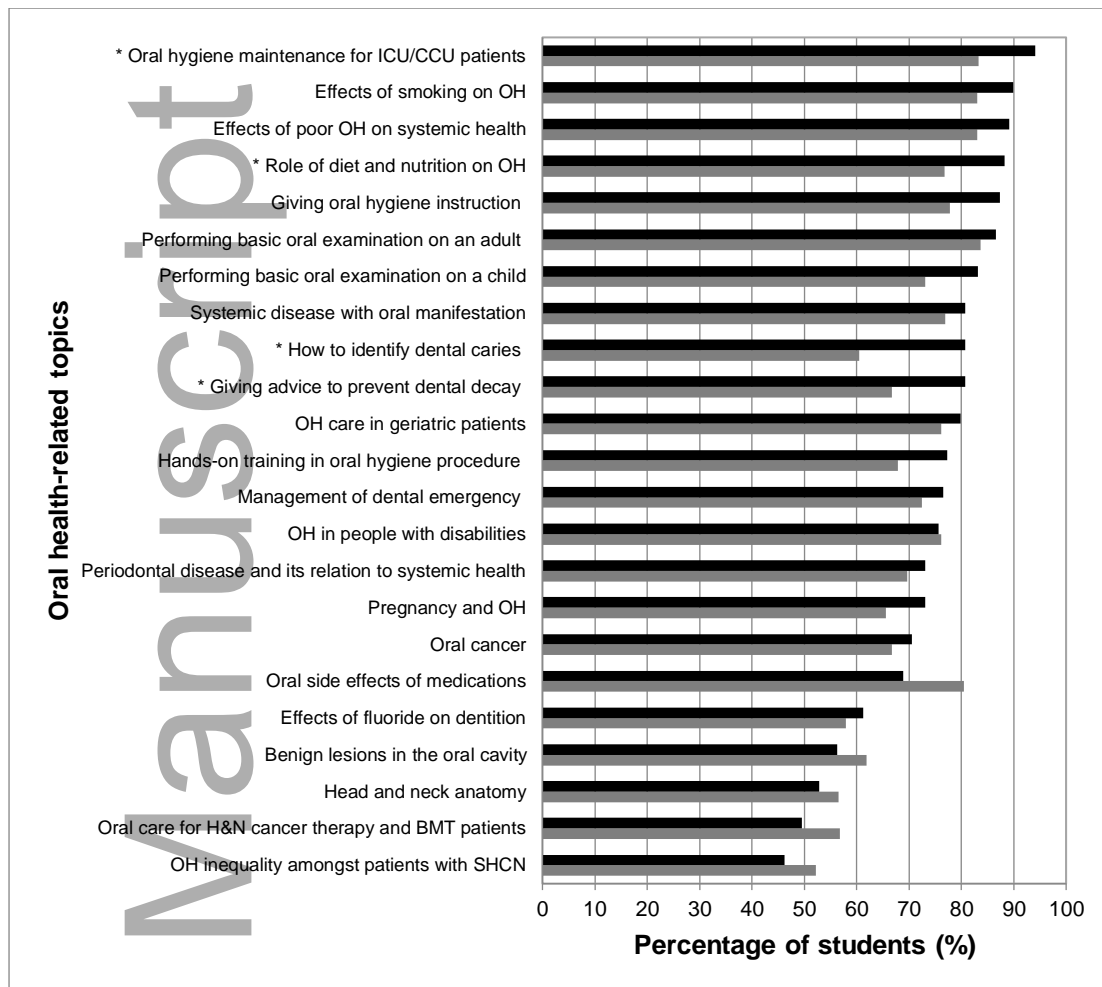


Fig. 2. Oral health-related topics perceived as important for nursing students to learn (Black Boxes = Malaysia, Grey boxes = Australia; \*  $p \leq 0.01$ ).

Note: ICU=intensive care unit; CCU=critical care unit; OH=oral health; H&N=head and neck; BMT=bone marrow transplant; SHCN=special health care needs.