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ORIGINAL ARTICLE

Oral health situation analysis and integration of Massive Open Online Course Modules on Oral Health Promotion in WHO SEAR Countries: A Comprehensive Report

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Abstract

Background: Massive Open Online Course (MOOC) modules are deemed to be novel educational models to optimize learning. They can be useful in delivering oral health education to primary health care workers to strengthen the oral health care delivery system. Therefore, the aim of this study is to analyze the current oral health situation analysis of the South East Asia region countries and to assess areas where the MOOC modules can be integrated as oral health training material. **Methodology:** A focus group discussion was held virtually with 70 participants from SEAR. The MOOC modules were developed as learning activities to facilitate the application of the material learned, in public settings. The themes for the situation analysis were based on oral health policy, barriers to dental treatment needs and action plan for implementation of the MOOC modules in each SEAR country. **Results:** Results highlighted the importance of formulating and implementing oral health policy at the national level among the participating countries. Nepal, Maldives, Timor–Leste reported on existing gaps regarding the unmet dental treatment needs. The inclusion of helath care workers in conducting dental procedures was observed in Bhutan. Global school health promoting initiatives were recorded in Maldives. The participating SEAR countries reported on the sensitization of primary healthcare workers through the developed MOOC modules. **Conclusion:** The developed massive open online course module was acknowledged to be an improved and interactive tool for primary health care workers by the country's oral health officers for oral health promotion and networking.

Keywords: oral health, WHO SEARO, barriers to oral health, health education, primary healthcare workers

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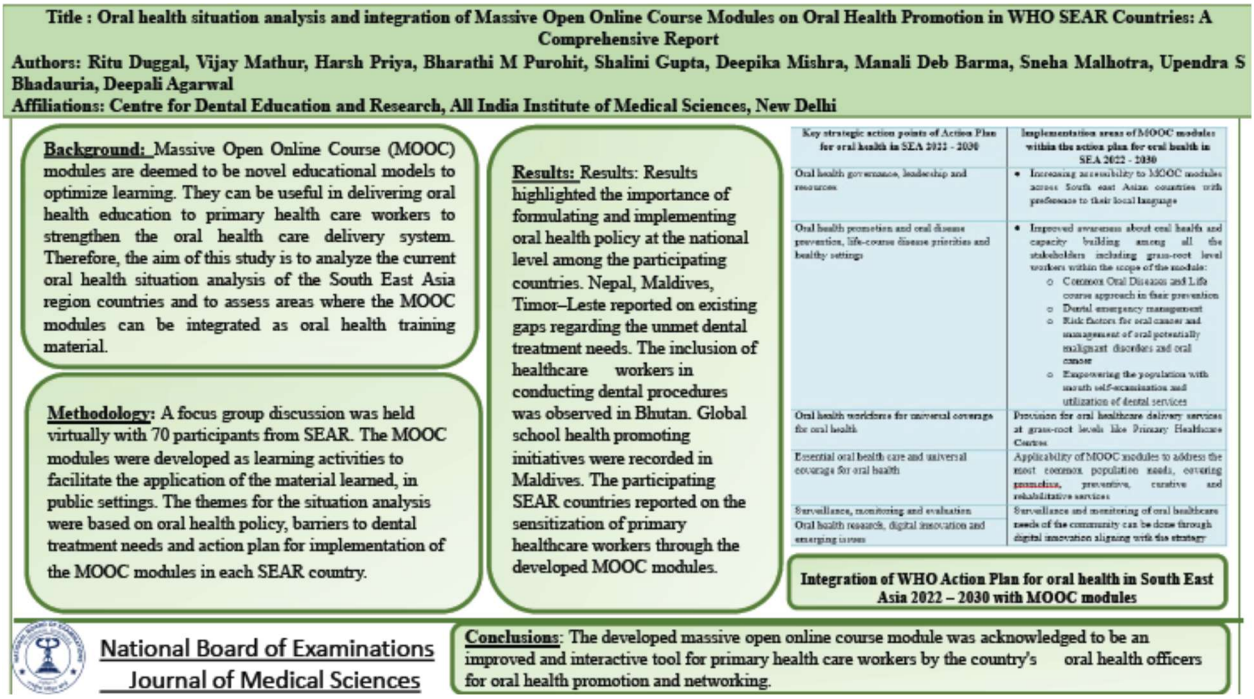
Graphical Abstract



Introduction

Massive Open Online Course (MOOC) was first developed in the early 2008, as an educational tool with the intention of making education more effective among students [1]. Unlike other traditional courses, the MOOCs are designed to accommodate huge numbers of students, frequently in thousands with technology assisting the educators in facilitating large scale learning [2]. Most of the evidence available to date does not specifically address MOOCs even though they offer an opportunity to deliver content online and to contribute to a blended learning design that could produce an equal or better learner outcome. MOOCs are typically lecture based offerings, using short video presentations and independent formative assessments, to allow large numbers of learners across the globe to obtain high-quality education without direct instructor feedback [3]. The courses may not be the primary mode of teaching for traditional medical courses which requires face to face practical and skill training with patients but act as an educational supplement through information propagation to many participants at the same time [4]. One of the examples in India is the Study Webs of Active Learning for Young Aspiring Minds (SWAYAM) portal [5] which is one of the government's efforts to establish a large number of online courses, practically all of which are free. Implementation of the courses is not a problem because the government has extensive infrastructure and resources. As online education continues to grow, it is important that it finds its use in various sectors especially health to facilitate learning. The health sector of India consists of a mix of public and private healthcare systems and is fundamentally divided into: primary, secondary and tertiary [6]. The healthcare system is designed such that at grassroot

level, primary health care workers provide preventive and curative services and become the first point of contact with the population [7,8]. Studies have been conducted to assess the oral health knowledge among primary healthcare workers, some of which have shown a good knowledge regarding oral health [9,10]. Online programs have demonstrated positive results for online learning in the areas of knowledge acquisition and retention, concluding that online education is at least equal to or superior to traditional educational methods for acquisition of knowledge and improving skill performance in nursing [11]. Various oral health training programs have also proved to be effective for primary healthcare workers [12-14], however this study was first of its kind to be conceptualized where an online educational resource has been used as a training material. The objective of this study is to analyze the current oral health situation analysis of the South East Asia region countries and to assess areas where the MOOC modules can be integrated as oral health training material.

Methodology

A Massive Open Online Course platform consisting of modules on basic oral health promotion targeted for the primary health care workers was developed by a team of faculties from interdisciplinary departments in Centre for Dental Education and Research, AIIMS New Delhi in 2019. A detailed content outline was drawn covering key topics in oral health promotion, preventive care and relevant interventions. A team of website developers were also approached to structure the module and incorporate multimedia elements for engagement. A proper script and storyboard was developed for video lectures so as to ensure a cohesive and well-paced presentation of content. In order to promote this tool and enhance its usage, this study was conceptualised.

The participants were included in the study through nominations which were provided by WHO technical staff. Nominations were received from all SEAR countries except DRP Korea and Indonesia. The invitations were sent through mail and repeated reminders were also sent to the participants. The interviews were conducted through an online platform. A series of meetings were conducted throughout September, 2021. The online meetings were scheduled every Wednesday in September and were timed for approximately 2 hours. The study was conducted as an in-depth interview among 70 representatives from participating countries. Since the series of meetings were as a part of the Massive Open Online Course modules, the meetings started with basic knowledge on each module, followed by which the participants were divided into breakout rooms in the online platform for the focus group discussions. In total, four focus groups were created where an equal number of participants were enrolled. Representatives from each participating country were allocated to every group so as to maintain homogeneity. The discussions in the focus groups were regulated by a moderator and a reporter. The broad topics which were discussed are the following:

A) Oral health policy at the national level

B) Barriers to dental treatment needs
C) Action plan for MOOC modules

The topics were further probed through guiding questions by the moderator. Each breakout room session continued for approximately 30 minutes. All the sessions were video recorded with consent of the participants. The recordings were transcribed into verbatim format. Based on their responses from the participants, we created a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis of the current situation regarding the oral healthcare system of the SEAR countries. SWOT analysis was adopted as it is effectively used as a strategic analytical method, for systematically analyzing organizational environments.

Results

The SWOT analysis has been depicted in Table 1. Among all the SEAR countries Nepal and Thailand had an existing national oral health policy. However Nepal reported the data incorporated was not evidence based and the formed policy objectives were not practical as no clear definitive directives were present. An organized system consisting of strategic plans for oral cancer, oral health care for elderly are present along with Universal Health Coverage in Thailand. Whereas, Bangladesh, India and Sri Lanka are in the process of drafting a national oral health policy. The MOOC modules could be used as a training component and integrated into the national oral health policy, as suggested by the country representatives. The auxiliary dental workforce was reported to be present in all SEAR countries. It was reported that Bhutan has introduced a Comprehensive School Health Program in all the districts whereby a group of health providers (general physician, dental surgeon, ENT technician and a lab technician) screen the school students and near-by communities. As per the Ministry of Health, the group is supposed to visit twice a year but due to budget constraints the visit is limited to just once in a year. Most of the dental workforce is composed of dental auxiliaries like dental hygienists who carry out oral prophylaxis, ART restorations, and dental extractions at remote places. Similarly, in India to bridge the gaps between urban and rural health disparities, there is inclusion of primary health care workers (ASHA, Anganwadi, ANM workers) but training them for oral healthcare services needs to be conducted through training programs, workshops. Bangladesh also reported presence of auxiliary healthcare workers but number of dental auxiliary workforce needs to be strengthened. Under this context, the modules were developed and intended to be used by them. Since the global school promoting initiatives are strong in Maldives, the school nurses also conduct oral health screening for the children and deemed to be an integral part of the healthcare workforce. Basic Package of Oral Care was implemented through auxiliary dental manpower in Nepal; however that led to malpractice in many areas. The weakness observed in Timor Leste was the low number of dental professionals therefore; there is an urgent need to strengthen the oral healthcare system through training of the medical workers for dental services as well.

Initiatives like National Oral Health Programs are required to provide infrastructure support and dental manpower in order to enrich the oral health services in a country. Out of all SEAR countries, only India, Sri Lanka and Thailand reported having specific programs for oral health services. This was an important area which needs focus for the rest of the South East Asian countries.

There are no National Oral Cancer screening programs in Bangladesh but screening of oral cancer is carried out by separate dental functional bodies, NGOs. Integration of oral cancer screening with NCDs has been proposed to the government. Similarly, no national oral cancer screening program is present in Nepal. However, integration with other cancer programs is done. Also, oral cancer screening is part of the PEN (Package of Essential non-communicable disease) package in Nepal. Since the PHC workers in any of the South East Asia Region countries are not trained in early detection for oral cancer, the modules can be used for the same since a major part of the MOOC modules focus on oral cancer detection. As Thailand reported, the National Cancer Control program is non-existing currently; however a pilot model has been initiated. Thailand feels an urgent need for early detection of oral cancer, since prevalence is on the higher side. It was also noted that among all SEAR countries, Thailand was the only country to have population based cancer registry. No countrywide oral cancer screening facilities are present in spite of the high tobacco usage in Bangladesh, Maldives, and Myanmar. In India and Bhutan, the National Cancer Control Program exists where oral cancer screening programs are also integrated; therefore, nationwide coverage for oral cancer screening is present. However, India reports a need for opportunistic screening for oral cancer. The future National Oral Health Policy in SEAR countries reportedly has provisions to focus on early detection of oral cancer along with the need to strengthen the existing National Cancer Registry. The possible areas of integration have been tabulated in Table 2. Table 3 indicates the integration of MOOC modules in the action plan for oral health in South East Asia 2022 – 2030.

Table 1. Strength, Weakness, Opportunities, and Threats of present oral health situation analysis of South East Asia Region countries*

Country	Strengths	Weakness	Opportunities	Threats
Bangladesh	Oral health is included in certain NCD programs	Unaffordability of dental services	National Oral Health Policy in drafting stage	Symptom oriented view of utilizing dental services
Bhutan	Inclusion of dental hygienist to conduct OH procedures	No existing oral health policy	National Oral Health Survey is being conducted to get evidence based data	Betel nut chewing habit is culturally embedded leading to more cases of OPMDs and OCs
India	Various national oral health programs (NOHP) and integrations are existing	Uneven distribution of dental services	National Oral Health Policy is in the drafting stage	Perceived need related to oral health priority is lacking
Maldives	Global school health promoting initiatives are strong	Geographical barrier due to topography	The recently created Maldives Dental Council can initiate oral health promotional activities	Tobacco habits start at as early as 10 years of age
Myanmar	National Health Plan	Health Financing	Auxiliary dental workforce	Poor execution of anti tobacco law
Nepal	Existing National Oral health policy	Lack of evidence based data	Proportional dentist and auxiliary workforce	Poor health education information communication campaigns
Sri Lanka	Established referral and back referral system	Limited fund allocation towards oral health	Proposals for establishments of dental clinics at medical centres	Inadequacy in advocacy of oral health at all levels
Thailand	National Oral Health survey conducted every 5 years	Lack of integration of medical and dental services	Enhancing the public private partnerships for oral health programs	Unequal distribution of dental services
Timor Leste	Poor oral health awareness	Only 8 dentists for the entire population	Effort to train nurses, medical auxiliary workforce	Advocacy for poor health is poor

*Source: Information provided by the national oral health focal points attending the discussion

Table 2. Action plan for integration of the Massive Open Online Course modules

Country	Action plan for integrating MOOC modules
Bangladesh	• Sub district dental surgeons, medical consultants, school teachers at district level should be targeted with these modules followed by monitoring and surveillance
Bhutan	• Can be integrated into National Cancer Program • It can also be used as a training Module for all health professionals.
India	• Integration can be done with NCD programs, ongoing oral health programs. • ASHA workers, Anganwadi workers would be the primary choice for implementing the modules • Strengthening of school oral health programs through training of teachers through these modules
Maldives	• Since, the school health programs are running successfully, implementation of the MOOC modules will work the best in that specific area. • Oral health is a component in the school curriculum as part of their health system too, therefore these modules can be used to strengthen the system • Even dental professionals can use these modules for oral health promotion
Myanmar	• The modules can be integrated in tobacco control programs • Translation into Burmese language required • Modules will be more helpful in physical format rather than online link based
Nepal	• The MOOC modules can be used in NCD programs, PHC workers. • Sensitization through training, hands on workshop followed by implementation • Training can be completed in 2-3 days • Basic survey to see number of cases being reported pre and post the training of HCWs using the modules
Sri Lanka	• Training of public health inspectors can be done using the modules. • In school health programs • Dental therapist posted in school health clinics • Practical demonstration will be best
Thailand	• As part of training programs for health professionals • Certification programs, workshops, hands on training will be more beneficial in disseminating these modules.
Timor Leste	• Health care workers constitute more in TL, therefore the modules can be used to sensitize them. • Questionnaires along with practical demonstrations would be appropriate

Table 3. Integration of WHO Action Plan for oral health in South East Asia 2022 – 2030 with MOOC modules

Key strategic action points of Action Plan for oral health in SEA 2022 - 2030	**Implementation areas of MOOC modules within the action plan for oral health in SEA 2022 - 2030**
Oral health governance, leadership and resources	● Increasing accessibility to MOOC modules across South east Asian countries with preference to their local language
Oral health promotion and oral disease prevention, life-course disease priorities and healthy settings	● Improved awareness about oral health and capacity building among all the stakeholders including grass-root level workers within the scope of the module: o Common Oral Diseases and Life course approach in their prevention o Dental emergency management o Risk factors for oral cancer and management of oral potentially malignant disorders and oral cancer o Empowering the population with mouth self-examination and utilization of dental services
Oral health workforce for universal coverage for oral health	Provision for oral healthcare delivery services at grass-root levels like Primary Healthcare Centres
Essential oral health care and universal coverage for oral health	Applicability of MOOC modules to address the most common population needs, covering promotive, preventive, curative and rehabilitative services
Surveillance, monitoring and evaluation	Surveillance and monitoring of oral healthcare needs of the community can be done through digital innovation aligning with the strategy
Oral health research, digital innovation and emerging issues	

Discussion

The current global health crisis as a result of the COVID-19 pandemic has expressed the need, now more than ever, for interprofessional collaboration among health professionals and health workers [15]. Alternative modes of oral health education and training delivery, such as online and remote learning, are thus becoming more common, and programmes must plan ahead to ensure high-quality healthcare delivery. With the same view, the MOOC modules were conceptualized to empower the healthcare workers especially at the primary healthcare level to understand the basics of oral healthcare (anatomy of oral cavity, common oral diseases, prevention and management of oral cancer). The current study conducted an oral health situation analysis among South East Asian Region countries and from our findings it may be interpreted that oral health is still an under-explored issue in these developing countries. The lack of an oral health policy was observed in all countries except Nepal and Thailand, leading to low oral health literacy [16] and an unorganized oral healthcare system. In 2007, the WHO World Health Assembly passed Resolution (WHA60.17) on oral health, urging countries to implement public health initiatives for disease prevention and health promotion [17]. This study identifies that low-income nations reported fewer preventive activities than middle-income countries, and especially when compared to high-income countries, indicating a significant difference in preventive care delivery. Under the same context, the MOOC modules were made to train the primary healthcare workers in South East Asia Region countries. A few alterations to the module like translation into regional language were suggested by the oral health focal points participating in the study. The oral health situation analysis identified various gaps in the oral health system of the SEAR countries mainly at the policy level and effective integration of oral health into primary health care. Through brainstorming it was suggested that guidance for the formulation of national oral health policy should be given by the nations with an existing national oral health policy (Nepal, Thailand) to the nations where the policy is at the drafting and conceptualizing stage.

The lack of sufficient dental manpower was also observed among Myanmar, Timor Leste, Maldives. Similar results have been reported in previous studies [18,19], therefore there is an urgency to initiate dental auxiliary training programs and eventually to make oral healthcare accessible at grass-root level. The use of the MOOC modules as training material was envisioned to act as a leverage point and promote public private partnerships which can dramatically bridge this barrier.

The oral health infrastructure was also reported to be lacking, and working conditions are inadequate in almost all SEAR member countries. This could be a significant impediment to providing proper oral health care to those who require it most. Harmonizing the oral health-care delivery system is another priority that came up during the discussion with the study participants.

In-spite of existing anti-tobacco laws, poor vigilance and monitoring was reported by all member country participants. The mortality to incidence ratio of oral cancer is

reported to be highest in SouthEast Asia, globally [20]. As the practice of consuming tobacco was observed in all SEAR countries, it must be ensured that anti-tobacco laws be refined and regulated strictly. Taxation on both forms of tobacco, fine based laws were some of the suggested resolutions that were inferred.

The WHO-HQ brief on the implementation of global targets to monitor progress toward 2023 and frequent reporting systems, similar to those for NCDs, will help countries build and maintain momentum in the oral healthcare delivery system. The distance between the current system and the ideal system can be bridged through sufficient public demand, political will and leadership [21]. Based on the key objectives of the Action Plan for oral health in South East Asia 2022 – 2030 [22], the MOOC modules can be an excellent tool of implementation to achieve advocacy, community involvement, and oral health promotion at community level with focus on the under privileged level.

Conclusion

The comprehensive report on the current oral health situation among the SEA countries shows that there is a need to strengthen the oral healthcare delivery system in majority of the countries. The formulation and implementation of an efficient National Oral Health Policy involving all the stakeholders of the community is best suited for an equitable, affordable oral health system. The incorporation of the Massive Open Course modules for oral health promotion will aid the oral healthcare services at community level and enrich the oral health related quality of life among the underserved population as well.

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Statements and Declarations

Conflicts of interest

The authors declares that they do not have conflict of interest.

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References

1. FDI World Dental Federation. Access to oral healthcare for vulnerable and underserved populations: Adopted by the General Assembly: September 2019, San Francisco, United States of America. Int Dent J. 2020 Feb;70(1):15–6. Available from: http://dx.doi.org/10.1111/idj.12556
2. Singh A, Purohit BM. Addressing oral health disparities, inequity in access and

workforce issues in a developing country. Int Dent J. 2013 Oct;63(5):225–9. Available from: http://dx.doi.org/10.1111/idj.12035
3. Health Organization W. Operational framework for primary health care: transforming vision into action. 2020; Available from: https://apps.who.int/iris/bitstream/handle/10665/337641/9789240017832-eng.pdf
4. Oral health inequalities and health systems in Asia-Pacific: a call for action. Available from: https://researchnow.flinders.edu.au/en/publications/oral-health-inequalities-and-health-systems-in-asia-pacific-a-cal
5. Swayam Central. Available from: https://swayam.gov.in/
6. Chokshi M, Patil B, Khanna R, Neogi SB, Sharma J, Paul VK, et al. Health systems in India. J Perinatol. 2016 Dec;36(s3):S9–12. Available from: http://dx.doi.org/10.1038/jp.2016.184
7. Fotedar S, Fotedar V, Bhardwaj V, Thakur AS, Vashisth S, Thakur P. Oral health knowledge and practices among primary healthcare workers in Shimla District, Himachal Pradesh, India. Indian J Dent Res. 2018 Nov-Dec;29(6):858–61. Available from: http://dx.doi.org/10.4103/ijdr.IJDR_276_17
8. Bangalore Sathyananda R, Krumeich A, Manjunath U, de Rijk A, van Schayck CP. Providers' perspectives on the performance of primary healthcare centres in India: The missing link. Int J Health Plann Manage. 2021 Sep;36(5):1533–52. Available from: http://dx.doi.org/10.1002/hpm.3176
9. Du S, Liu Z, Liu S, Yin H, Xu G, Zhang H, et al. Web-based distance learning for nurse education: a systematic review. Int Nurs Rev. 2013 Jun;60(2):167–77. Available from: http://dx.doi.org/10.1111/inr.12015
10. Kaur S, Kaur B, Ahluwalia SS. Oral health knowledge, attitude and practices amongst health professionals in Ludhiana, India. Dentistry. 2015.
11. Kearney RC, Premaraj S, Smith BM, Olson GW, Williamson AE, Romanos G. Massive Open Online Courses in Dental Education: Two Viewpoints: Viewpoint 1: Massive Open Online Courses Offer Transformative Technology for Dental Education and Viewpoint 2: Massive Open Online Courses Are Not Ready for Primetime. J Dent Educ. 2016 Feb;80(2):121–7. Available from: https://www.ncbi.nlm.nih.gov/pubmed/26834128
12. Stokes CW, Towers AC, Jinks PV, Symington A. Discover Dentistry: encouraging wider participation in dentistry using a massive open online course (MOOC). Br Dent J. 2015 Jul 24;219(2):81–5. Available from: http://dx.doi.org/10.1038/sj.bdj.2015.559
13. Mahajan R, Gupta P, Singh T. Massive Open Online Courses: Concept and Implications. Indian Pediatr. 2019 Jun 15;56(6):489–95. Available from: https://www.ncbi.nlm.nih.gov/pubmed/31278230
14. Murray JA. Massive Open Online Courses: Current and Future Trends in Biomedical Sciences. Adv Exp Med Biol. 2019;1171:47–53. Available from: http://dx.doi.org/10.1007/978-3-030-24281-7_5
15. Khalili H. Online interprofessional education during and post the COVID-19 pandemic: a commentary. J Interprof Care. 2020 Jul 16;34(5):687–90. Available from: http://dx.doi.org/10.1080/13561820.2020.1792424

16. Batra M, Gupta S, Erbas B. Oral Health Beliefs, Attitudes, and Practices of South Asian Migrants: A Systematic Review. Int J Environ Res Public Health. 2019 Jun 1;16(11). Available from: http://dx.doi.org/10.3390/ijerph16111952
17. Petersen PE, Baez RJ, Ogawa H. Global application of oral disease prevention and health promotion as measured 10 years after the 2007 World Health Assembly statement on oral health. Community Dent Oral Epidemiol. 2020 Aug;48(4):338–48. Available from: http://dx.doi.org/10.1111/cdoe.12538
18. Price JA, Soares AIFS, Asante AD, Martins JS, Williams K, Wiseman VL. "I go I die, I stay I die, better to stay and die in my house": understanding the barriers to accessing health care in Timor-Leste. BMC Health Serv Res. 2016 Sep 30;16(1):535. Available from: https://doi.org/10.1186/s12913-016-1762-2
19. Aung EE, Maung K, Zaitsu T, Kawaguchi Y. An Overview of Oral Health Situation and Challenges in Myanmar. AJRMMS. 2019;1–10. Available from: http://globalpresshub.com/index.php/AJRMMS/article/view/687
20. Cheong SC, Vatanasapt P, Yi-Hsin Y, Zain RB, Kerr AR, Johnson NW. Oral cancer in South East Asia: Current status and future directions. Translational Research in Oral Oncology. 2017 Jan 1;2:2057178X17702921. Available from: https://doi.org/10.1177/2057178X17702921
21. Mertz EA, Finocchio L. Improving oral healthcare delivery systems through workforce innovations: an introduction. J Public Health Dent. 2010 Jun;70 Suppl 1(Suppl 1):S1–5. Available from: http://dx.doi.org/10.1111/j.1752-7325.2010.00179.x
22. Health Organization W. Action plan for oral health in South-East Asia 2022–2030: towards universal health coverage for oral health. 2022; Available from: https://apps.who.int/iris/bitstream/handle/10665/363753/9789290210061-eng.pdf?sequence=1