Population Burden of Betel Quid Abuse and Its Relation to Oral Premalignant Disorders in South, Southeast, and East Asia: An Asian Betel-Quid Consortium Study

Chien-Hung Lee, PhD, Albert Min-Shan Ko, MD, Saman Warnakulasuriya, PhD, Tian-You Ling, MD, Sunarjo, MD, MSc, Palandage Sunethra Rajapakse, PhD, MPH, BDS, Rosnah Binti Zain, PhD, Salah Osman Ibrahim, PhD, Shan-Shan Zhang, MD, MS, Han-Jiang Wu, MD, Lin Liu, MD, MS, Kuntoro, MD, DPH, Budi Utomo, MD, MK, Supun Amila Warusavithana, MD, Ishak Abdul Razak, PhD, Norilda Abdullah, PhD, Prashanta Shrestha, MD, Tien-Yu Shieh, PhD, Cheng-Fang Yen, MD, PhD, and Ying-Chin Ko, PhD

Chien-Hung Lee is with the Department of Public Health, Albert Min-Shan Ko and Ying-Chin Ko are with the Center of Excellence for Environmental Medicine, and Tien-Yu Shieh is with the Department of Oral Hygiene, Kaohsiung Medical University, Kaohsiung, Taiwan. Cheng-Fang Yen is with the Department of Psychiatry, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan. Saman Warnakulasuriya is with Department of Oral Medicine, King's College London, UK. Tian-You Ling, Shan-Shan Zhang, Han-Jiang Wu, and Lin Liu are with the Department of Stomatology, Second Xiangya Hospital, Central South University, Changsha, China. Sunarjo, Kuntoro, and Budi Utomo are with the Department of Public Health & Preventive Medicine, Airlangga University, Surabaya, Indonesia. Palandage Sunethra Rajapakse and Supun Amila Warusavithana are with the Faculty of Dental Sciences, University of Peradeniya, Peradeniya, Sri Lanka. Rosnah Binti Zain is with the Oral Cancer Research and Coordinating Centre, Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia. Salah Osman Ibrahim is with the Department of Biomedicine, University of Bergen, Bergen, Norway. Ishak Abdul Razak is with the Faculty of Dentistry, University of Malaya, Kuala Lumpur, Malaysia. Norilda Abdullah is with Oral Health Division, Ministry of Health, Kuala Lumpur, Malaysia. Prashanta Shrestha is with B and B Hospital, Kathmandu University Teaching Hospital, Kavrepalanchowk, Nepal.

Correspondence should be sent to Ying-Chin Ko, the Center of Excellence for Environmental Medicine, Kaohsiung Medical University, No.100 Shih-Chuan 1st Road, Kaohsiung 807, Taiwan. (e-mail: ycko@kmu.edu.tw). Reprints can be ordered at http://www.ajph.org by clicking the "Reprints/Eprints" link.

Peer Reviewed

Contributors

Y. C. Ko designed this study and directed its implementation, including quality assurance and control. C. H. Lee contributed to the development of the models, the data analysis, and the writing of the article. A. M. Ko contributed to the interpretation of study research findings. S. Warnakulasuriya provided guidance on the analytic plan and the final article. T. Y. Ling, Sunarjo, P. S. Rajapakse, R. B. Zain, S. O. Ibrahim, S. S. Zhang, H. J. Wu, L. Liu, Kuntoro, B. Utomo, S. A. Warusavithana, I. A. Razak, N. Abdullah, P. Shrestha helped supervise the field activities. T. Y. Shieh and C. F. Yen helped conduct the literature review.

ABSTRACT

Objectives. We investigated the population burden of betel quid abuse and its related impact on oral premalignant disorders (OPDs) in South, Southeast, and East Asia.

Methods. The Asian Betel-Quid Consortium conducted a multistage sampling of 8922 representative participants from Taiwan, Mainland China, Malaysia, Indonesia, Nepal, and Sri Lanka. Participants received an interviewer-administered survey and were examined for oral mucosal disorders.

Results. The prevalence of betel quid abuse was 0.8% to 46.3% across 6 Asian populations. The abuse frequency was over 40.5% for current chewers, with the highest proportion in Nepalese and Southeast Asian chewers (76.9%–99.6%). Tobacco-added betel quid conferred higher abuse rates (74.4%–99.6%) among Malaysian, Indonesian, and Sri Lankan men than did tobacco-free betel quid (21.8%–89.1%). Gender, lower education level, younger age at chewing initiation, and clustering of familial betel quid use significantly contributed to higher abuse rates. Indonesian betel quid abusers showed the highest prevalence of OPDs and had a greater risk of OPDs than did nonusers.

Conclusions. Betel quid abuse is high in regions of Asia where it is customarily practiced, and the abuse rate is more likely to be higher in areas where tobacco is added to the betel quid. Further study is warranted to examine the factors that contribute to betel quid abuse and its relation to oral premalignant conditions.