Assessing the readiness to integrate tobacco control in medical curriculum: Experiences from five medical colleges in southern India

FOR THE PROJECT QUIT TOBACCO INTERNATIONAL

ABSTRACT

Background. Making tobacco cessation a normative part of all clinical practice is the only way to substantially reduce tobacco-related deaths and the burden of tobacco-related morbidity in the short term. This study was undertaken because information on receptivity to integrate tobacco control education in the medical curriculum is extremely limited in low- and middle-income countries.

Methods. From five medical colleges (two government) in southern India, 713 (men 59%) faculty and 2585 (men 48%) students participated in our cross-sectional survey. Information on self-reported tobacco use and readiness to integrate tobacco control education in the medical curriculum was collected from both the faculty and students using a pre-tested structured questionnaire. Multiple logistic regression analysis was done to find the associated factors.

Results. Current smoking was reported by 9.0% (95% CI 6.6–12.1) of men faculty and 13.7% (CI 11.8–15.9) by men students. Faculty who were teaching tobacco-related topics [odds ratio (OR) 2.29; 95% CI 1.65–3.20] compared to those who were not, faculty in government colleges (OR 1.69; CI 1.22–2.35) compared to those in private colleges and medical specialists (OR 1.79; CI 1.23–2.59) compared to surgical and non-clinical specialists were more likely to be ready to integrate tobacco control education in the medical curriculum. Non-smoking students (OR 2.58; CI 2.01–3.33) compared to smokers, and women students (OR 1.80; CI 1.50–2.17) compared to men were more likely to be ready to integrate a tobacco control education in the curriculum.

Conclusion. Faculty and students are receptive to introduce tobacco control in the medical curriculum. Government faculty, medical specialists and faculty who already teach tobacco-related topics are likely to be early introducers of this new curriculum.

INTRODUCTION

Tobacco use is estimated to cause one billion deaths in the 21st century and 70% of these deaths will be in low- and middle-income countries. In India, tobacco use has been steadily increasing for the past several years. In 2010, there were about 275 million tobacco users in India: 48% men and 20% women in the age group of 15 years and above used some form of tobacco. Smoking, one of the many ways of consuming tobacco in India, was predicted to cause about one million deaths in India in 2010. Morbidity due to tobacco use has also been increasing exponentially in India, resulting in human suffering and high healthcare expenditure by families and the government. India’s tobacco-attributable direct healthcare expenditure was estimated to be US$ 1.2 billion (about ₹6500 crore) in 2004. Making tobacco cessation a normative part of all clinical practice is the only way to substantially reduce tobacco-related deaths, and the burden of tobacco-related morbidity in the short term. Illness is a teachable moment and doctors at any level, at least, need to ask patients about their tobacco use and advise them to quit such use after informing them about the harms of tobacco consumed. To establish the relevance of their advice and make it compelling, it is important for doctors to be able to point out how patients’ immediate health problems and long-term health risks are associated with their tobacco use. Establishing relevance requires more than just giving general advice that tobacco is bad for health. Patients want to know both what the risks of tobacco...
use are, and how tobacco use harms their body beyond causing cancer or making their lungs black. To advise patients, doctors need to explain how smoking, for example, affects the vascular system and leads to complications of diabetes, or interferes with the body’s ability to recover from back pain and so on. To do so, medical students need to receive comprehensive tobacco control education in medical college which teaches them key tobacco facts related to a broad range of health problems and trains them in brief cessation counselling skills. However, it has already been reported that the Indian medical curriculum has little information on the dangers of tobacco use and the specific harm to the body.\(^3\)

Do medical college faculty and students recognize the importance of counselling patients about tobacco use? To what extent are students taught tobacco facts and how to counsel patients? Are faculty and students interested in learning brief cessation intervention skills? Establishing their readiness to adopt a tobacco curriculum is a first step in the implementation of a cessation training programme such as that presently being promoted by the Project Quit Tobacco International (QTI).\(^3\) We examined the readiness of five medical colleges in southern India (Kerala and Karnataka state) to adopt an integrated tobacco education programme. We begin with a situational analysis of current tobacco use by faculty and students in the five medical colleges and then move to consideration of current levels of tobacco control education and cessation training, and receptivity to the integration of a comprehensive tobacco control curriculum in these medical colleges.

**METHODS**

**Study setting**

In 2008, we conducted a curriculum review to evaluate existing tobacco content in the lectures of five medical colleges in the states of Kerala and Karnataka, representing a range of public and private, urban and rural medical colleges. This was followed (2009–10) by cross-sectional surveys of all undergraduate medical students and faculty members to assess the levels of tobacco use, tobacco cessation practice and receptivity, and readiness to adopt a more comprehensive education programme, and create a smoke-free campus.

**Curriculum review**

Course materials were reviewed in all subject areas in the revised Indian medical curriculum for the presence of key tobacco facts related to epidemiology and impact of tobacco on overall rates of morbidity and mortality, the link between tobacco and specific types of health problems, tobacco dependence and cessation skills. We assessed the presence of any facts in courses as well as whether the education was sufficient.

**Sample selection**

We approached all 999 faculty members from the five medical colleges; 748 of them returned the questionnaires (response rate 74.8%). Of 3423 students admitted in all the batches in the five selected medical colleges, 78.5% students present on the day of the survey participated in the study. Respondents whose core information was not available were excluded from analysis. Thus, 713 medical faculty and 2585 medical students were included for analysis.

**Ethical clearance**

We obtained ethical clearance for the study from the Institutional Review Board of the Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Thiruvananthapuram, Kerala, the coordinating centre of the project in India and the Health Ministry Screening Committee of the Government of India. Written permission was taken from the principals of the colleges. Verbal consent from the students and written informed consent from the medical faculty were obtained before participation in the study.

**Data collection**

Culturally sensitive questionnaires previously developed, separately for faculty and students by the QTI team (QTI\(^1\)) were modified, pre-tested and administered for the present study. In each of the selected medical colleges a coordinator and a team of researchers were trained to implement the questionnaire. Confidentiality was maintained by the absence of personal identifiers in the questionnaire. The coordinating team explained the objectives of the study to the faculty and students. Before the faculty survey, a common meeting of all the faculty members in the five selected medical colleges was conducted. Survey details and pilot implementation of the tobacco modules were discussed during the meeting. The QTI coordinator of each college (head of the department of community medicine) contacted all the faculty members personally or by telephone. Multiple strategies were used to contact all the faculty members. A junior faculty member from the department of community medicine distributed the questionnaire to all the faculty members. In some colleges, a junior faculty was identified in each department who was then entrusted with the distribution and collection of the questionnaire from their department. Repeated visits and contacts were made to maximize the response rate. Details of basic demographics, teaching on tobacco-related subjects, interest in receiving tobacco cessation training, and their specialty were gathered from medical college faculty (with at least an MBBS—basic medical degree in India—and at least one year of teaching experience) from selected medical colleges. The students’ survey was managed by the QTI coordinator and the team members in the community medicine department from each medical college. The research team approached all the students during common lecture class. With the help of the students representatives from each class, the questionnaire was distributed and instructions given for filling it. Details of smoking, importance for medical students to receive education about tobacco in medical colleges and their support for a smoke-free medical college campus policy were included in the questionnaire. After filling the details, the forms were collected back at the end of the class.

**Statistical analysis**

Faculty and students survey data from the five colleges were pooled and analysed using SPSS (version 17.0; SPSS Inc., Chicago, IL, USA). Descriptive statistical analyses were performed and percentages, medians and range were calculated for all relevant variables. In the case of faculty, their interest in receiving future training in tobacco cessation was taken as readiness to integrate tobacco control in the medical curriculum. For students the importance to receive education about tobacco control in medical colleges and their support for a smoke-free medical college campus policy were taken together as an outcome variable (readiness to integrate tobacco control in the medical curriculum). For categorical variables, chi-square test was used to test for associations. A p value of <0.05 was considered statistically significant. Multiple logistic regression analysis was done to assess the associations between readiness to integrate tobacco control in medical curriculum and other independent variables.
Student data from one of the medical colleges were excluded from the smoking prevalence analysis as they had undertaken a non-smoking pledge at the time of joining.

**Definition of smoking status**

*Ever smoker:* Smoked at least one cigarette/bidi at some point in one’s lifetime

*Current smoker:* Smoked at least one cigarette/bidi in the past 30 days

*Never smoker:* Those who had never smoked even one cigarette/bidi.

**RESULTS**

Our sample consisted of 713 faculty members (men 59%) and 2585 medical students (men 47.7%). Faculty members had an average of 10 years of professional experience and included faculty from medical (43%), surgical (33%) and non-clinical (24%) specialties. The mean (SD) age of faculty members was 39.2 (9.7) years and that of students was 20.3 (1.7) years. Fifty-seven per cent of faculty members and 62% of students were from private institutions and 58% of faculty members and 46% of students were from Kerala; the rest were from Karnataka.

**Prevalence of smoking**

Of the men in the study sample, 28% of faculty and 26% of students were ever smokers (Table I). About two-thirds (66%) of the current smokers, smoked less than four sticks (cigarettes/bidis) per day. Of the 38 men faculty who were current smokers, 17 (45%) were surgical specialists, 14 (37%) were medical specialists and 7 (18%) were non-clinical faculty.

Men faculty who were current smokers (n=38) when asked why they continued to smoke gave varying reasons. These included that it was a habit that was hard to stop due to withdrawal or craving (12), they enjoyed smoking (11), they smoked very little so there was no need to quit (5), it helped to reduce stress (4), they were in good health so it was alright to smoke (1) and everyone around them were smokers and it would be difficult for them to stop for social reasons (1); some other reasons were mentioned by the remaining 4. Among men faculty who were current smokers, 24 (62%) had tried to quit smoking unsuccessfully in the recent past. Among the 24 who tried to quit smoking, 15 reported trying to quit due to a concern about tobacco-related health hazards. The other reasons reported were pressure from family or friends (12), a perception that doctors are not expected to smoke (7), existing health problems (3) and health problems of friend or relatives (2).

A comparison of the number of current smokers among men students in four medical colleges showed a range from 8.9% to 19%. Current smoking among students in government medical colleges was 10.9% compared to 19% in private medical colleges (p=0.01). Notably among current men students who were smokers, 60% started smoking after joining medical college and the prevalence of smoking increased with increasing years of education from 4.3% among first year students to 21.3% from among final year students (Fig. 1).

Forty-two of 150 men students who were current smokers, smoked daily in the past 30 days. The majority of men students who were current smokers (90, 60%) smoked less than four sticks per day. Among current smokers, 47% reported craving for smoking every day. Among them, 53% reported experiencing mild, 31% moderate and 16% severe craving. More than half the men students who were current smokers had tried to quit (80, 53%) smoking sometime in the recent past. Nearly half the students who tried to quit smoking reported that they were able to reduce the quantity of smoking.

Eight per cent of current non-smokers reported that they could take up smoking while they were in medical college. This was significantly higher for men (13%) than women (4%) students. Second year men students who were current non-smokers reported the highest anticipated prevalence of smoking (19%). Thus, combining current smokers with those who could initiate smoking, 26% of men students and 5% of women students were considered to comprise a group who had an ‘intention’ towards smoking.

**Knowledge about the harm of smoking**

To the question on ‘how many sticks can be smoked safely in a day without harming one’s own health’, 89% of faculty reported that there was no safe level of smoking (men 89%, women 90%). Of the remaining 75 faculty, 5 (7%) said that one cigarette per day was safe, 17 (23%) said two cigarettes were safe and the remaining 53 (70%) said that more than two sticks per day were safe to use. The median level of safe smoking reported was four sticks (range 1–15). More men smokers said that there was a safe level of smoking (34%) compared to those who were non-smokers (8%).

Several questions were put to students related to their knowledge of the harm of tobacco use. We report on their response to one key question. We asked all students ‘how many cigarettes can a person smoke a day without harm to one’s health’ to assess the students’...
perception of the harm of smoking. More than half the students (54%) reported that there is no safe level and even a single cigarette was harmful to health (men 50%, women 59%). However, of the remaining 46%, 26% reported that one can use one cigarette per day safely, 33% two cigarettes safely, and the remaining 41% of students reported that more than two cigarettes per day was safe to use without harm to one’s health. The safe level of smoking reported was significantly more by men students (50.3%) than by women (41%) students. More than three-fourths (77%) of men smokers reported safe level of smoking compared to 46% of men non-smokers. Median number of sticks reported as safe level of smoking was two (range 1–100) (three for smokers and two for non-smokers).

Is tobacco taught in classes?

Tobacco education was not a mandated part of any class and information delivered was neither systematic nor sufficient. Even in the modification of the medical curriculum in 2008 for the MBBS academic calendar 2008–14, there was very little addition on the dangers of tobacco use. Only minimal coverage was found in the paediatrics curriculum where smoking and environmental pollution was included as a subtopic under the respiratory system. This is an important omission, given that, as future doctors, students are expected to lead tobacco control efforts especially with regard to provision of cessation services to patients and thus contribute considerably to prevention of tobacco-related illness.

Tobacco-related research was conducted by 6% of faculty and 8% of students during the year preceding the survey. Forty-two per cent of the faculty (47% men and 34% women) reported that they were presently exposing students to the harms of tobacco in their lectures. In most cases this information was not on any specific risk of tobacco use but as a general passing comment during the lectures.

Nearly two-thirds (64%) of students (n=1983) (from second year onwards) reported that they received some exposure to the harms of tobacco in their classes. The corresponding percentage was 51% for second year (n=580), 72% for third year (n=491), 74% for fourth year (n=421) and 76% for final year (n=491) students. Students stated that the information received was minimal, not required for their examinations and that training in cessation of smoking or how to conduct counselling sessions on cessation was not included in their classes.

### Table II. Student’s smoking status before joining medical college and chance of future smoking while in medical college

<table>
<thead>
<tr>
<th>Variable</th>
<th>Opinion on the chance of future smoking*</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Smoked before starting medical college</td>
<td>86 (7.9)</td>
</tr>
<tr>
<td></td>
<td>Will never take up smoking</td>
<td>819 (75.1)</td>
</tr>
<tr>
<td></td>
<td>Could take up smoking in medical college</td>
<td>186 (17.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1091</td>
</tr>
<tr>
<td>Sex†</td>
<td>Men</td>
<td>41 (3.6)</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>1047 (92.2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>47 (4.1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1135</td>
</tr>
<tr>
<td>Year of study in medical college†</td>
<td>First</td>
<td>11 (2.2)</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>31 (6.1)</td>
</tr>
<tr>
<td></td>
<td>Third</td>
<td>12 (2.8)</td>
</tr>
<tr>
<td></td>
<td>Fourth</td>
<td>46 (13.0)</td>
</tr>
<tr>
<td></td>
<td>Fifth</td>
<td>27 (6.2)</td>
</tr>
<tr>
<td></td>
<td>All</td>
<td>127 (5.7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1866 (83.8)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>233 (10.5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2226</td>
</tr>
</tbody>
</table>

Values in parentheses are percentages  
* includes only four medical colleges  
† p<0.001

### Cessation of smoking and receptivity to receiving cessation training

Among medical faculty only 20% reported having sufficient training or experience to help patients quit use of tobacco. Close to half (48.8%) the faculty were very interested, 36.2% somewhat interested and the remaining 15% were not interested in receiving tobacco control training.

### Opinion of students on the role of a doctor in tobacco cessation

Eighty-nine per cent of students felt that a doctor should advise patients to quit tobacco use. This was significantly (p<0.001) different among smokers (77%) and non-smokers (89%). Most students (96%) felt that it was important to receive education on tobacco control during the medical course. Moreover, a policy of a smoke-free medical college was supported by 87% of students, 89% of non-smokers and 44% of current smokers (p<0.001).

On multiple logistic regression analysis the factors that favoured the faculty incorporating tobacco control education in the medical curriculum were teaching tobacco-related topics, faculty in government college and medical specialists (Table III). Similarly, women students and those who had never smoked were more willing to have tobacco control education in the medical curriculum (Table IV).

Fifty-one per cent of the faculty was interested in receiving training in the use of medication that might help people quit the use of tobacco. However, 15% were not interested and 34% were only somewhat interested.

### Table III. Medical faculty’s readiness to integrate tobacco control in medical curriculum: Results of multiple logistic regression analysis

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Ready to integrate tobacco control in medical curriculum (%)</th>
<th>Adjusted odds ratio (n=644)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching tobacco-related topics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>39.9</td>
<td>Reference</td>
</tr>
<tr>
<td>Yes</td>
<td>59.8</td>
<td>2.29 (1.65–3.20)†</td>
</tr>
<tr>
<td>Type of institution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>43.9</td>
<td>Reference</td>
</tr>
<tr>
<td>Government</td>
<td>55.1</td>
<td>1.69 (1.22–2.35)*</td>
</tr>
<tr>
<td>Specialty</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical</td>
<td>40.7</td>
<td>Reference</td>
</tr>
<tr>
<td>Medical</td>
<td>54.5</td>
<td>1.79 (1.23–2.59)*</td>
</tr>
<tr>
<td>Non-clinical</td>
<td>50.0</td>
<td>1.65 (1.05–2.58)*</td>
</tr>
<tr>
<td>*p&lt;0.05, †p&lt;0.001 other variables included and not found to be significant were age and sex</td>
<td></td>
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</tr>
</tbody>
</table>

### Table IV. Medical students’ opinion on the readiness to integrate tobacco control in medical curriculum: Results of multiple logistic regression analysis

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Ready to integrate tobacco control in medical curriculum (%)</th>
<th>Adjusted odds ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>52.5</td>
<td>Reference</td>
</tr>
<tr>
<td>Women</td>
<td>70.7</td>
<td>1.80 (1.50–2.17)†</td>
</tr>
<tr>
<td>Ever smoking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>38.1</td>
<td>Reference</td>
</tr>
<tr>
<td>No</td>
<td>66.1</td>
<td>2.58 (2.01–3.33)†</td>
</tr>
<tr>
<td>* includes only four medical colleges  †p&lt;0.001 other variables included and not found to be significant were age and type of institution</td>
<td></td>
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</tr>
</tbody>
</table>
Most (96%) medical students felt that as future doctors it was important for them to receive comprehensive education about tobacco control and how to counsel patients to quit using tobacco.

DISCUSSION

It has been well established that for a downward shift in tobacco use to occur, healthcare providers must be at the forefront of tobacco cessation and control policies. To do so, they need to both quit using tobacco themselves and routinely advise patients to quit. Research has established that advice from a doctor to a patient can significantly increase the rate of quitting smoking and the desire to quit smoking. In an earlier study conducted by the QTI in Kerala, India, we found that 35.3% of doctors surveyed in Thiruvananthapuram, including medical college faculty, always enquired about tobacco use during routine medical practice and patients who presented with diseases such as lung cancer, tuberculosis, chronic obstructive lung disease, and other severe respiratory illnesses were advised to quit use of tobacco. Furthermore, most quit messages given to patients by doctors were general and not illness-specific. Notably, those faculty who had never smoked were three times more likely to ask their patients to quit tobacco compared to those who currently smoked. The results of our first study suggested that a comprehensive tobacco control education programme was necessary in medical colleges linking illness-specific tobacco facts to cessation practice. It has also been shown that practising clinicians are more likely to engage in behaviours that they learned during their formal education than those learnt in less formal settings. Our study is possibly the first one in India to assess the willingness of medical college faculty and students to adopt a comprehensive tobacco curriculum.

We found that a fair number of medical college faculty still smoke, and that the prevalence of medical student smoking varies by college campus. Pooled data indicated that 7% of medical students presently smoke, and among non-smokers 8% said that there is a chance they would do so in the future. Our study confirms the findings of an earlier study from India, that a majority of medical students start smoking after joining medical college. Notably, rates of smoking increase over the course. This suggests that education about the harm of tobacco and the duty of doctors to act as role models is possibly not reaching students. In a recent study from southern India, >90% of the medical and nursing students reported that the current training in their curriculum in tobacco control and cessation was minimal and they were interested in further training. Some of the medical faculty who attempted to quit smoking did so because they felt that doctors should set a good example for students and the public. A previous QTI study found that education about tobacco in medical colleges is limited and consists largely of general facts about mortality and cancer risk. Little, if any, attention is given to the importance of advising a patient to quit or how to assist them in doing so.

Nearly half the students (46%) felt that low-level smoking was not harmful. This suggests that these students are unlikely to advise patients to quit smoking unless they are heavy smokers. A previous QTI study found that many doctors share this misperception. However, both medical faculty and students were receptive to the introduction of a comprehensive tobacco curriculum that would educate students on how tobacco is connected to a wide range of health problems and teach them cessation skills. Medical students endorsed the idea that doctors should know such skills regardless of whether they were examined on them. Both students and faculty did, however, convey to the researchers in qualitative interviews that including an evaluation on the subject would increase students’ motivation for developing competence. In all the five medical colleges surveyed, readiness to introduce a tobacco curriculum was high and faculty were ready to plan and implement this educational change. The proposed curriculum is likely to reduce tobacco use among both faculty and students. The presentation of the data collected in this study facilitated discussions with college administrators enabling the implementation of action plans. The subsequent piloting of an innovative tobacco curriculum will be the subject of a companion paper.

Another important finding of our study was that a large majority of medical students, smokers and non-smokers alike, supported a smoke-free campus policy. We presented this information to college administrators, and those who did not have such a policy, agreed to adopt one.

On the basis of our study and a positive assessment of faculty readiness to adopt a tobacco curriculum, the Project Quit Tobacco International invited these five campuses to become pilot project sites for implementation of an innovative comprehensive tobacco curriculum. This modular curriculum integrates tobacco facts in all areas of medical college education and teaches cessation skills across 5 years of undergraduate education. This curriculum is now available for other colleges to adopt or adapt (quitotobaccointernational.org) and lessons learnt from its implementation in these five medical colleges will be the subject of a future publication. A first step when considering the implementation of such a curriculum is the assessment of a campus’ readiness to do so. As in the case of counselling patients, if readiness in the form of faculty support is low (as marked by ambivalence), then steps need to be taken to raise the awareness of faculty as to both the mortality and morbidity related to tobacco, the range of health problems caused or exacerbated by the use of tobacco, the effectiveness of doctor quit messages when delivered skilfully, and modern medical education’s embracing of tobacco cessation as a core competency for medical practice.

Limitations

Self-reported information was not validated by any objective measures. However, self-reports have been found to be reliable and are commonly used in epidemiological research. It has also been reported that non-response bias may be less in health professionals’ surveys compared to those of the general public.

Conclusion

It is essential to a country’s tobacco control strategy that future doctors be educated about the adverse health effects of tobacco use and trained to promote smoking cessation as well as support primary prevention. Our study indicates that both medical faculty and students in India feel that cessation of smoking is an important part of a doctor’s role and should be taught in medical colleges. At present, tobacco education is not well integrated into India’s medical college curriculum and most faculty do not have the competence to train students in how to counsel patients to quit tobacco use. Training in cessation during medical college is essential because research has shown that lack of training and confidence in counselling skills is a major barrier to doctors engaging in tobacco cessation counselling with patients.

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Conflict of interest. None declared

Contributions. MN and KRT designed the study. TRY, KRT and MN coordinated the study. PS, KL, MS, BU and SRB implemented the study in each of the five medical colleges. GKM conducted the statistical analysis. CA, GKM and KRT wrote the draft. All authors contributed to the revision of the draft and approved the final manuscript for submission.

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