



Original Research

Open Access

Knowledge, Attitudes and Practices of General Practitioners Towards Smoking Cessation Guidelines in Private Practice, Brunei Darussalam

Norhasyimah MAHADI^{1*}, Mahmud Shauqi MAHMUD SAEDON¹, Azizul ABD RAHMAN²

Abstract

Introduction: Cancer is the leading cause of death in Brunei Darussalam, with smoking as the main risk factor for lung and other cancers. Approximately one-fifth of adults in Brunei smoke, with General Practitioners (GPs) serving as the primary providers of smoking cessation services. This study assessed private GPs' knowledge, attitudes, and practices (KAP) regarding Smoking cessation guidelines. **Materials and Methods:** A validated questionnaire, used with permission, was adapted into Microsoft Forms and distributed to eligible private GPs in Brunei Darussalam identified through the Brunei Medical Board (BMB) register with responses collected over four weeks and analysed. **Results:** A total of 50 private GPs participated between August and September 2025. A minority demonstrated good KAP: 18% had good knowledge, 34% had a positive attitude, and 20% demonstrated good practice. No statistically significant differences were observed in most KAP scores across sociodemographic and professional variables ($p > 0.05$), except for practice scores, which showed a significant difference across experienced groups ($p = < 0.018$), with less experienced GPs showing higher median practice scores. Correlation analysis revealed weak, non-significant relationships between knowledge, attitude, and practice scores, suggesting that these domains function independently. **Conclusions:** Knowledge of smoking cessation guidelines among private GPs was low and did not predict attitude or practice. Positive attitudes did not drive implementation, which was influenced by clinical experience.

Keywords: Attitude and Practice; Clinical Practice Guidelines; General Practitioners; Knowledge; Primary care; Smoking cessation.

Author Details:

1 Outpatient Department, Jerudong Park Medical Centre, Brunei Darussalam

2 Health Information Management, Jerudong Park Medical Centre, Brunei Darussalam

Correspondence: Dr Norhasyimah binti Mahadi

dr.norhasyimah@jpmc.com.bn

The Brunei International Medical Journal (BIMJ) is a peer-reviewed official publication of the Ministry of Health and Universiti Brunei Darussalam, under the auspices of the Clinical Research Unit, Ministry of Health, Brunei Darussalam. The BIMJ publishes articles ranging from original research papers, review articles, medical practice papers, special reports, audits, case reports, images of interest, education and technical/innovation papers, editorials, commentaries, and letters to the Editor. Topics of interest include all subjects related to clinical practice and research in all branches of medicine, both basic and clinical, including topics related to allied health care fields. The BIMJ welcomes manuscripts from contributors but usually solicits review articles and special reports. Proposals for review papers can be sent directly to the Managing Editor. Please refer to the contact information of the Editorial Office.

DISCLAIMER: All articles published, including editorials and letters, represent the opinions of the contributors and do not reflect the official views or policies of the Clinical Research Unit, the Ministry of Health, or the institutions with which the contributors are affiliated, unless clearly stated. The appearance of advertisements does not constitute an endorsement by the Clinical Research Unit or the Ministry of Health, Brunei Darussalam. Furthermore, the publisher cannot accept responsibility for the correctness or accuracy of the advertisers' text, claims, or any

INTRODUCTION

Cancer is the leading cause of death in Brunei, accounting for 19% of total mortality in the country.¹ Data from Department of Economic Planning and Statistics, Ministry of Finance and Economy, Brunei Darussalam for the year 2025, showed cancer remain the leading cause of death, accounting for 19.9% of all death. This is followed by death from cardiovascular disease; 15.6% and cerebrovascular disease; 8.6%.² Lung and bronchus cancer is the leading cause of cancer death in males (17.7%), whereas in females, it ranks second after breast cancer (14.4%).³ Cigarette smoking is the leading risk factor for lung cancer. It is also linked to cancers of the mouth, throat, oesophagus, stomach, colon, rectum, liver, pancreas, larynx, lungs, trachea, bronchi, kidneys and renal pelvis, bladder, cervix, as well as acute myeloid leukemia.⁴ Despite strong tobacco control policies in Brunei, smoking prevalence remains relatively high among men. Approximately one-fifth of the adult population in Brunei are current smokers, with males being nearly ten times more likely to smoke than females.⁵ The 2019 Brunei Darussalam Global School-based Student Health Survey (GSHS) showed that 9.8% students age 13-17 are smokers, with 15.4% are males and 4.3% are females.⁶

A General Practitioner (GP) is a doctor who serves as the first point of contact in healthcare. GPs provide or coordinate ongoing, comprehensive care, including both prevention and treatment.⁷ Therefore, GPs play a crucial role in implementing evidence-based smoking-cessation guidelines as part of the national effort to curb tobacco use and lessen the cancer burden.

Within the Ministry of Health (MOH) Brunei Darussalam, Smoking Cessation Clinics are well-established, nurse-led services available in most health centres nationwide, providing free support to Brunei citizens seeking to quit smoking.⁸ In comparison, there is limited information regarding the provision of smoking cessation services in private clinics in Brunei. These facilities play an important role in supporting national efforts to reduce burden of tobacco use and are clinically significant, as they are GP-led and have the capacity to initiate multiple pharmacological treatment options.

In Brunei, smoking cessation practice follows the national Clinical Practice Guideline on Smoking Cessation (Clinical Practice Guideline, Smoking Cessation Guideline 2014), which adopts the internationally recognized 5A's (Ask, Advise, Assess, Assist, Arrange) and 5R's (Relevance, Risks, Rewards, Roadblocks, Repetition) framework to guide clinical practice.⁹

Similarly, neighbouring countries such as Malaysia adopt the same approach and strategies model for smoking cessation in their guideline; Treatment of Tobacco Use Disorder.¹⁰ There was a study conducted to evaluate the knowledge, attitudes, and practices (KAP) of their primary care providers regarding their adherence to the national guidelines on smoking cessation using validated questionnaires which was developed with established reliability.¹¹⁻¹²

As an initial step, conducting the study in private clinics settings is appropriate, as they constitute a feasible study population and may serve as a basis for subsequent research. Future studies should be conducted within the MOH primary care clinics, the main provider of smoking cessation services where the patient volume is higher. Assessing this KAP will help identify gaps and develop strategies to enhance smoking cessation outcome in the country.

MATERIALS AND METHODS

Study design and Population: A cross-sectional survey was conducted to assess knowledge, attitude, and practice (KAP) of general practitioners (GPs) regarding the study topic. The study involved GPs working in Private clinics in Brunei Darussalam across Brunei-Muara, Tutong and Kuala Belait districts. A total of 31 clinics comprising 113 GPs were identified via the Brunei Medical Board and the '*List of private healthcare and dental facilities*' on the Ministry of Health (MOH) website. Of these, 97 GPs from 28 clinics who met the inclusion criteria (GPs in private clinics providing general practice services) were invited to participate in the study. The exclusion criteria were those GPs or primary care providers in the MOH Brunei Health Centres, Pengiran Anak Puteri Rashidah Sa'adatul Bolkiah (PAPRSB) Institute of Health Sciences, the Medical services of Royal Brunei Armed Forces, Singapore Armed Forces doctors in Brunei and British Forces Brunei. To ensure feasibility within the constraints of time and work commitments, the study intentionally focus on GPs working in private clinics. The PAPRSB Institute of Health Sciences, the Medical services of Royal Brunei Armed Forces, Singapore Armed Forces doctors in Brunei and British Forces Brunei were excluded in the study as they serve a unique and closed population that are not representative of the GPs in general. As such, their inclusion may limit the generalisability of the findings, as their KAP may not add significant value to broader primary care outcome.

Research Instrument: This study utilised a structured, validated questionnaire with permission from the origi-

nal author.¹¹⁻¹² The questionnaires consisted of two parts. The first part collected participants' (GPs) characteristics and sociodemographic information, while the second part comprised the core 22-KAP items. Minor modifications made to the demographic section to suit the local context, with the knowledge and approval of the original instrument author. The questionnaire (**Appendix I**) was distributed electronically using Microsoft form. The 22 KAP items questionnaires were developed based on the 5A's framework (Ask, Assess, Advise, Assist, Arrange) and the 5R's framework (Relevance, Risks, Rewards, Roadblocks, Repetition), which also aligned with the 2014 Smoking Cessation Guidelines of the Ministry of Health, Brunei Darussalam.

The instrument consisted of 22 items: five assessing knowledge, five assessing attitudes, and 12 assessing practices.¹¹⁻¹² The scoring and cut-off points followed the guidelines established by the original instrument's author, with further clarification obtained through email correspondence with the author on 4 December 2024. Knowledge was measured using True/False options, with a score of 5 indicating good knowledge and less than 5 indicating poor knowledge. Attitudes were assessed on a five-point Likert scale (ranging from strongly agree to strongly disagree), where scores of 5 or above reflected a positive attitude. Practice was evaluated using frequency responses (always to never), with a total score of 24 defined as good practice.

Data Collection: The questionnaire, accompanied by a Participant Information Sheet, was distributed via email to key personnel in private clinics who subsequently disseminated it to their GPs. The study participants were required to complete the questionnaires that included screening questions to ensure their eligibility. An informed consent was obtained, and those who declined were automatically exited from the survey. All responses were collected anonymously and were automatically compiled in the password protected research email account, which was only accessible to research team members, stored in Excel files and subsequently analysed. A total of 60 respondents out of 97 GPs from 28 clinics were invited. After data cleaning, 10 responses were excluded due to invalid entries. The final analysis, therefore, included 50 valid responses.

Statistical Analysis: Normality of KAP scores was assessed using the Shapiro-Wilk test. All scores were found to be non-normally distributed ($p < 0.05$). Therefore, non-parametric statistical methods were applied. Associations between KAP scores and binary variables (gender, religion, smoking status, second-hand expo-

sure, training, and pharmacological treatment) were analysed using Wilcoxon rank-sum tests.

Associations between KAP scores with categorical variables with more than two groups (age group, location, ethnicity, experience group) were analysed using Kruskal-Wallis tests. Spearman's rank correlation coefficient was used to assess relationships between KAP scores. The level of statistical significance was set at $p < 0.05$.

Reliability of KAP items: Domain-specific reliability was assessed using Cronbach's alpha (Knowledge's $\alpha = 0.62$; Attitude's $\alpha = 0.65$; Practice's $\alpha = 0.92$). These results indicate moderate reliability for knowledge and attitude items and excellent reliability for practice items, indicating acceptable but limited internal consistency for knowledge and attitude domains.

RESULTS

A total of 50 private general practitioners participated in this study. The majority were female (58%), and aged 50-59 years (38.0%). Most participants were of Malay ethnicity (64.0%) and worked in the Brunei-Muara district (90.0%). In terms of professional experience, 44.0% had between 21 and 30 years of clinical experience. Most participants identified as Muslim (76.0%). The majority were non-smokers (92.0%), and almost all reported no exposure to second-hand smoke (98.0%). Nearly all participants had not attended smoking cessation training in the past two years (98.0%) and had not been prescribed pharmacological treatment for smoking cessation (98.0%). **Table I** presents the socio-demographic and characteristics of the participants

Distribution of KAP: All KAP scores were found to be non-normally distributed; therefore, medians and interquartile ranges (IQR) were used for reporting. The median knowledge scores were 4 (IQR 1) out of a maximum of 5. The median attitude score was 4 (IQR 2) out of 10, while the median practice score was 9.5 (IQR 6.75) out of 24.

Based on predefined thresholds, only a minority of participants demonstrated a good level of KAP. Good knowledge was observed in 18% of participants, good attitude in 34%, and good practice in 20%. **Table II** summarises the distribution and classification of KAP scores.

Table I: Sociodemographic and Professional Characteristics of Participants (n = 50).

Characteristic	Category	n	%
Gender	Female	29	58.0
	Male	21	42.0
Age Group (years)	≤39	8	16.0
	40–49	17	34.0
	50–59	19	38.0
	≥60	6	12.0
Location of practice	Brunei-Muara	45	90.0
	Kuala Belait	3	6.0
	Tutong	2	4.0
Ethnicity	Malay	32	64.0
	Chinese	7	14.0
	Indian	3	6.0
	Others	8	16.0
Years of clinical experience (years)	≤10	5	10.0
	11–20	16	32.0
	21–30	22	44.0
	≥31	7	14.0
Religion	Muslim	38	76.0
	Non-Muslim	12	24.0
Smoking status	Non-smoker	46	92.0
	Ex-smoker	4	8.0
Secondhand smoke exposure	No	46	98.0
	Yes	1	2.0
Prior training related to the topic	No	49	98.0
	Yes	1	2.0
Prescription of smoking cessation pharmacotherapy	No	46	92.0
	Yes	4	8.0

Table II: Distribution and Levels of Knowledge, Attitude, and Practice (KAP) Scores.

Domain	Scale	Median (IQR)	Min–Max	Good n (%)	Poor n (%)
Knowledge	0–5	4 (1.0)	0–5	9 (18.0)	41 (82.0)
Attitude	0–10	4 (2.0)	0–10	17 (34.0)	33 (66.0)
Practice	0–24	9.5 (6.8)	0–24	10 (20.0)	40 (80.0)

IQR=interquartile range (Q3-Q1); Min = Minimum; Max = Maximum; n = number of participants. Data is presented as a median (IQR) or n (%)

Association of KAP with Sociodemographic and GPs Characteristics Variables: No statistically significant differences in KAP scores across the GPs characteristics variables (smoking status and second-hand smoke exposure, years of clinical experience, prior training and prescription of smoking cessation pharmacotherapy) and sociodemographic variables (gender, age, religion, ethnicity, location of practice) ($p>0.05$).

Similarly, knowledge and attitude scores did not differ significantly across age, location, ethnicity, or experience categories.

However, practice scores differed significantly across experience groups (Kruskal-Wallis test, $p=0.018$). Participants with fewer years of experience have higher median practice scores than those with longer clinical experience. **Table III** presents the association between years of clinical experience and KAP scores.

Table III: Association Between Year of Clinical Experience and Knowledge Attitude and Practice (KAP) Scores.

KAP Score	Clinical Experience in years				P value ^a
	≤10	11–20	21–30	≥31	
	Median (IQR)	Median (IQR)	Median (IQR)	Median (IQR)	
Knowledge	2 (2.0)	3 (2.5)	3 (1.0)	3 (2.5)	0.464
Attitude	3 (4.0)	3.5 (2.3)	4 (2.0)	3 (2.0)	0.942
Practice	21 (4.0)	9 (5.3)	7.5 (5.0)	13 (7.0)	0.018

IQR=interquartile range (Q3-Q1)

Correlation Between KAP Domains: Spearman correlation analysis showed weak and non-significant relationships between knowledge, attitude, and practice scores. Knowledge and attitude showed a weak positive correlation ($p=0.25$, $p=0.085$), while knowledge and practice ($p=-0.18$, $p=0.22$) and attitude and practice ($p=0.01$, $p=0.936$) showed no meaningful association. These results suggested that knowledge, attitude, and practice stand largely as independent domains in this study. **Table IV** presents the correlation between the KAP domains.

Table IV: Correlation between Knowledge, Attitude and Practice domains.

Correlation between	Spearman ρ	p-value
Knowledge & Attitude	0.250	0.085
Knowledge & Practice	-0.180	0.220
Attitude & Practice	-0.010	0.936

DISCUSSIONS

The 5As and 5Rs framework by World Health Organization (WHO) is a well-established evidence-based, brief intervention that should be incorporated into routine GPs practice.¹³

This framework is simple, can be delivered within 3–5 minutes, represent a cost-effective strategy for smoking cessation. GPs are uniquely positioned to screen, advise and facilitate patients in quitting smoking.

Therefore, assessing GPs's knowledge, attitudes and practices (KAP) is essential in strengthening smoking cessation interventions aimed at reducing the burden of cancers, cardiovascular and cerebrovascular condition which remain public health concerns in Brunei Darussalam. A range of systemic reviews has concluded that primary care physician's advice significantly increases smoking cessation compared to no advice.¹⁴ Moreover, multiple studies have demonstrated that the smoking cessation success rate is significantly improved when physician-led smoking cessation counselling is combined with effective pharmacological therapies.¹⁵⁻¹⁶

To the best of our knowledge, this is the first study of KAP regarding smoking cessation guidelines among primary care providers or GPs in Brunei Darussalam, with our study focus-on GPs at the private clinics.

Most participating GPs were non-smokers and reported minimal or no exposure to second-hand smoke. Most were based in the Brunei-Muara district, which is the central and most populated region of Brunei. Importantly, most respondents reported not having attended any smoking cessation-related training within the past two years, highlighting a gap in continuing education that may hinder translation of knowledge into practice. The small sample size, however, may limit statistical comparison between trained and untrained GPs.

Regarding GPs' smoking status, our study found no association between GP smoking habits and engagement in smoking cessation, consistent with findings reported in Saudi Arabia.¹⁷ Similarly, a study examining factors influencing European GPs' involvement in smoking cessation noted that GPs who smoke tend to provide cessation advice less frequently than nonsmoking GPs, although this pattern has not been consistently supported across studies.¹⁸ A broader comparative study across 11 European Union (EU) countries further concluded that while smoking GPs were somewhat less likely to advise patients to quit, the difference was not statistically significant.¹⁹

In this cross-sectional study, knowledge level among GP at private clinics were generally low and consistent across demographic variables, with no statistically significant differences observed across gender, age group, ethnicity, location, smoking status, second-hand exposure, or pharmacotherapy use. These results are consistent with studies in Malaysia, where primary care GPs also reported low KAP scores.²⁰ However, unlike our study, the Malaysian study demonstrated significant association of GPs or participants characteristics in awareness and practice, with attendance at training pro-

gram and years of experience predicting better KAP scores. In contrast, our study showed knowledge scores did not differ significantly between GPs who reported receiving training and those who did not. This may reflect variability in the content, quality, or recency of training programs, as well as the potential role of clinical experience and self-directed learning in acquiring knowledge. This underscores the need for structured, comprehensive, and reinforced training programs to ensure knowledge is effectively translated into practice.

Interestingly, knowledge was weakly and non-significantly correlated with both attitude and practice, indicating that awareness alone does not necessarily translate into clinical implementation. Enhanced training programs, coupled with incentives for private GPs, may help bridge this gap.

Attitude scores were also similar across different demographic variables (age, gender, ethnicity, location, religion, smoking status and second-hand smoke exposure) and professional variables (training status, experience level and use of pharmacotherapy). Internal consistency was moderate (Cronbach's alpha = 0.65).

Although some GPs expressed positive attitudes toward smoking cessation, these did not significantly influence clinical practice. Comparable findings have been reported in studies conducted in Saudi Arabia, where positive attitudes coexisted with low knowledge and practice level.¹⁷ This indicates positive beliefs about smoking cessation does not always translate into consistent action.

Practice scores, however, demonstrated excellent reliability (Cronbach's alpha = 0.92) and differed significantly across experience groups. Less experienced GPs reported higher practice scores, possibly reflecting greater exposure to updated guidelines and recent clinical training.

Generally, knowledge influences attitudes, which in turn guide practices. However, in our study, the variation between knowledge, attitudes, and practices suggests that the three domains may stand independently in real world context rather than in a linear fashion.

Several external determinants may shape the extent to which general practitioners engage in smoking cessation practices. Systemic factors such as healthcare structures, the prioritisation of tobacco control within national health policies, the availability of cessation resources (e.g., pharmacotherapy and referral pathways) strongly influence the extent to which smoking cessation practices are implemented. In addition, workplace realities such as limited consultation time, heavy

workloads and the presence or absence of financial incentives, can either encourage or discourage GPs from integrating cessation advice into routine care. These barriers have been reported in European studies, where lack of time, workload, and reimbursement issues were identified as major barriers limiting GP engagement in smoking cessation.¹⁸

In Malaysia, the implementation of public-private partnerships through initiatives such as 'mQuit', launched in 2015, which successfully increased patient engagement in smoking cessation services. For example, the number of patients registered with private 'mQuit' providers rose from 10 in January 2017 to 394 by June 2017.²¹ Such initiatives highlight how system-level support can enhance accessibility and uptake of smoking cessation services, offering a potential model for Brunei.

Patient-related factors, including motivation to quit, socioeconomic background, cultural norms surrounding tobacco use, and the level of trust in the physician, further affect the receptiveness and effectiveness of counselling. Brunei's strict tobacco control policies, including import restrictions and the absence of licensed tobacco retailers, may further influence smoking behaviour and social norms, potentially leading to underreporting due to social desirability bias. Additionally, the availability of subsidised smoking cessation services in government facilities may affect how patients access care and how private GPs perceive their role. Furthermore, smoking cessation services in Brunei are predominantly nurse-led, which may reduce private GPs' perceived need to provide such services, potentially contributing to observed differences in practice.

Taken together, our findings highlight that improving smoking cessation practice requires more than enhancing knowledge or promoting positive attitudes. Structured training, practical experience, and system-level support are essential to facilitate the effective translation of knowledge and attitudes into clinical practice. Future research should explore perceived barriers among GPs to better understand existing challenges and inform targeted strategies for improvement.

Strength and Limitation of this Study: This study has several limitations that warrants acknowledgement. First, the sample size was relatively small, which may have limited the statistical power and generalisability of the findings. The small sample size also has reduced the ability to detect subtle differences or associations. Nevertheless, the study provides valuable preliminary insights and serves as a foundation for future research,

particularly within the Ministry of Health (MOH) setting where most general practitioners (GPs) are based.

Despite the limited sample size, appropriate parametric statistical tests were employed, thereby strengthening the validity of the findings. The study also contributes baseline data that may support future larger investigations.

Another strength of this study lies in the use of a previously validated questionnaire. The Cronbach's alpha values for the knowledge and attitude domains were 0.62 and 0.65, respectively, indicating moderate internal consistency within the current study sample. Although these values are slightly below the commonly cited threshold of 0.70, they remain acceptable for the purpose of this study. However, it may have influenced the measurement precision.

CONCLUSIONS

Knowledge among GPs was generally consistent but did not necessarily translate into clinical practice. Although positive attitudes were observed, these were insufficient to drive implementation, with clinical practices influenced by individual experience, highlighting gaps between knowledge, attitudes, and actual behaviour. Bridging these gaps may require targeted training, system-level support, and practical interventions to facilitate evidence-based practice among GPs.

Recommendations: Further research involving Ministry of Health primary care providers in Brunei Darussalam is recommended to validate these findings and provide further insight into smoking cessation practices. Revision and updating of the existing Smoking Cessation Guidelines (2014) should be considered to support current evidence-based practice. Additionally, structured training programmes on smoking cessation may help improve implementation and reduce the gap between knowledge, attitudes, and clinical practice among primary care providers.

Abbreviations

KAP	Knowledge, Attitude and Practice
MOH	Ministry of Health
GPs	General Practitioners
MHREC	Medical and Health Research Ethics Committee
CPG	Clinical Practice Guideline
IQR	Interquartile Range

Conflict of Interest

All authors declare that there is no conflict of interest.

Ethical consideration

This study has obtained ethical approval from the Medical and Health Research Ethics Committee (MHREC) Brunei prior commencement.

Acknowledgement

We would like to express our sincere gratitude to the original author of the questionnaire; Assistant Professor Dr Mohd Shaiful Ehsan bin Shalihin, Clinical lecturer of Family Medicine department, Kuliyah of Medicine of International Islamic University of Malaysia for granting permission to use it in this study.

REFERENCES

- Ministry of Health Brunei Darussalam. Brunei health information booklet 2017 [Internet]. Bandar Seri Begawan: Ministry of Health; 2017 [cited 2025 May 2]. Available from: <https://www.aidsdatahub.org/sites/default/files/resource/brunei-health-information-booklet-2017.pdf>.
- Department of Economic Planning and Statistics. Brunei Darussalam Statistical Yearbook 2025. Bandar Seri Begawan: Ministry of Finance and Economy; 2025. Available from: https://deps.mofe.gov.bn/wp-content/uploads/2026/07/BDSYB_2025.pdf.
- Leong E, Ong SK, Si-Ramlee KA, Naing L. Cancer incidence and mortality in Brunei Darussalam, 2011 to 2020. *BMC Cancer*. 2023;23:466. doi:10.1186/s12885-023-10962-8.
- Centers for Disease Control and Prevention (CDC). Lung cancer risk factors [Internet]. Atlanta (GA): CDC; [cited 2025 Feb 2]. Available from: <https://www.cdc.gov/lung-cancer/risk-factors/index.html>.
- Ministry of Health Brunei Darussalam. Brunei Darussalam Multisectoral Action Plan for the Prevention and Control of Non-Communicable Diseases (BruMAP-NCD 2021–2025) [Internet]. Bandar Seri Begawan: Ministry of Health Brunei Darussalam; 2021 [cited 2024 Dec 3]. Available from: https://moh.gov.bn/wp-content/uploads/2024/10/BRUMAP-NCD2021_compressed.pdf.
- World Health Organization (WHO). Global School Health Survey (GSHS): Brunei Darussalam 2019 fact sheet [Internet]. Geneva: WHO; 2019 [cited 2024 Dec 3]. Available from: <https://cdn.who.int/media/docs/default-source/nccd-surveillance/data-reporting/bruneidarussalam/brunei-darussalam-2019-fact-sheet.pdf>.
- World Health Organization (WHO). Definition of general practitioner. WHO Technical Report Series No. 267 [Internet]. Geneva: WHO; [cited 2025 Feb 2]. Available from: https://iris.who.int/bitstream/handle/10665/40572/WHO_TRS_267.pdf.
- Ministry of Health Brunei Darussalam. Nursing services [Internet]. Bandar Seri Begawan: Ministry of Health Brunei Darussalam; [cited 2024 Dec 3]. Available from: <https://moh.gov.bn/services/nursing-services/>.
- Ministry of Health Brunei Darussalam. Smoking cessation guideline 2014. Bandar Seri Begawan: Ministry of Health; 2014.
- Ministry of Health Malaysia. Clinical practice guideline: Treatment of tobacco use disorder [Internet]. Putrajaya: Ministry of Health Malaysia; [cited 2024 Dec 3]. Available from: <https://www.acadmed.org.my/CPGdl/CPG%20Treatment%20of%20Tobacco%20Use%20Disorder.pdf>.
- Shalihin MSEB, Md Aris MA, Nik Mohamed MH, Mohd Rus R, Aida Jamani N. Reliability and construct validity of knowledge, attitude, and practice of medical doctors on smoking cessation guidelines. *IUM Med J Malays*. 2018;17(1). doi:10.31436/imjm.v17i1.103.
- Shalihin MSE, Md Aris MA, Nik Mohamed MH. Revised version of knowledge, attitude and practice of medical doctors on smoking cessation guidelines questionnaire. *Malays J Appl Sci*. 2020;5(1):95–104. doi:10.37231/myjas.2020.5.1.237.
- World Health Organization (WHO). Toolkit for delivering 5As and 5Rs brief tobacco interventions in primary care [Internet]. Geneva: WHO; [cited 2024 Dec 3]. Available from: <https://www.who.int/publications/i/item/toolkit-for-delivering-5as-and-5rs-brief-tobacco-interventions-in-primary-care>.
- Stead LF, Buitrago D, Preciado N, Sanchez G, Hartmann-Boyce J, Lancaster T. Physician advice for smoking cessation. *Cochrane Database Syst Rev*. 2013;(5):CD000165. doi:10.1002/14651858.CD000165.pub4.
- Fiore MC, Jaén CR, Baker TB, Bailey WC, Benowitz NL, Curry SJ, et al. Treating tobacco use and dependence: 2008 update. Clinical practice guideline. Rockville (MD): U.S. Department of Health and Human Services, Public Health Service; 2008. Available from: https://www.ahrq.gov/sites/default/files/wysiwyg/professionals/clinicians-providers/guidelines-recommendations/tobacco/clinicians/update/treating_tobacco_use08.pdf.
- Zhou C, Wu L, Liu Q, An H, Jiang B, Zuo F, et al. Evaluation of smoking cessation intervention in patients with chronic diseases in smoking cessation clinics. *Medicine (Baltimore)*. 2017;96:e7459.
- Al-Jdani S, Mashabi S, Alsaywid B, Zahrani A. Smoking cessation counseling: knowledge, attitude and practices of primary healthcare providers at National Guard Primary Healthcare Centers, Western Region, Saudi Arabia. *J Fam Community Med*. 2018;25(3):175–182. doi:10.4103/jfcm.JFCM_142_17.
- Stead M, Angus K, Holme I, Cohen D, Tait G; PESCE European Research Team. Factors influencing European GPs' engagement in smoking cessation: a multi-country literature review. *Br J Gen Pract*. 2009;59(566):682–690. doi:10.3399/bjgp09X454007.
- Brotons C, Björkelund C, Bulc M, Ciurana R, Godycki-Cwirko M, Jurgova E, et al. Prevention and health promotion in clinical practice: the views of general practitioners in Europe. *Prev Med*. 2005;40(5):595–601. doi:10.1016/j.ypmed.2004.07.020.
- Shalihin MSE, Nik Mohamed MH, Jamani NA, Md Aris MAB. Knowledge, Attitude and Practice of Malaysian Medical Doctors on Smoking Cessation Guideline. *imjm* [Internet]. 2020 Jan. 15 [cited 2024 Dec 3];18(3). Available from: <https://journals.iium.edu.my/kom/index.php/imjm/article/view/566>.
- Hassan N, Baharom N, Dawam N D, Ismail N, Festus C E, Mihat O et al. Strengthening quit smoking services in Malaysia through Malaysia Quit (mQuit) Program. *Tobacco Induced Diseases*. 2018;16(1):862. <https://doi.org/10.18332/tid/84344>.
- Rashid AA, Hashim N, Govadan PD, et al. Factors associated with practice of smoking cessation guidelines among primary care doctors in northern Malaysia: a cross-sectional study. *Discov Soc Sci Health*. 2025;5:18. doi:10.1007/s44155-025-00165-w.

Appendix I



SMOKING CESSATION GUIDELINES QUESTIONNAIRES

STUDY TITLE: Knowledge, Attitude, and Practice (KAP) on Smoking Cessation Guidelines Among General Practitioners (GPs) in Non-Ministry of Health (Non-MOH) facilities in Brunei Darussalam.

* Required

INFORMED CONSENT

Participation is voluntary but highly encouraged, and responses will remain confidential, anonymous, and used only for research purposes. Please read 'Participant Information Sheet' carefully before completing the questionnaire. Do not include your name/email in the open-ended answer. By clicking 'Agree', you consent to participate. *

- ☐ I agree
- ☐ I disagree

Do you currently work at a government health facility in Brunei Darussalam, such as those under the Ministry of Health (MOH), PAPRSB Institute of Health Sciences, Royal Brunei Armed Forces Medical Services, Singapore Armed Forces, or British Forces Brunei? *

- ☐ Yes
- ☐ No – I worked at a private clinic of a non- government health facility

DEMOGRAPHIC DATA

CLINIC LOCATION (District) *

- ☐ Brunei-Muara
- ☐ Tutong
- ☐ Kuala Belait
- ☐ Temburong

GENDER *

- ☐ Male
- ☐ Female

AGE (years in number without decimals) *

ETHNICITY *

- ☐ Malay
- ☐ Chinese
- ☐ Indian
- ☐ Others

RELIGION *

- ☐ Muslim
- ☐ Non-Muslim

EXPERIENCE / YEARS OF PRACTICE AS MEDICAL DOCTOR *including internship / housemanship* (in numbers without decimals) *

SMOKING STATUS *

- ☐ Smoker (current smoker or stopped smoking <6months)
☐ Non-smoker (never smoke)
☐ Ex-smoker (quitted smoking for ≥ 6month)

SECONDHAND SMOKER?(Exposed to cigarettes smoke at least 15min a day , three days a week) *

- ☐ Yes
☐ No

HAVE YOU ATTENDED ANY TRAINING IN SMOKING CESSATION IN THE PAST 2 YEARS ? *

- ☐ Yes
☐ No

Please specify: *

Have you prescribed pharmacological treatment for Quit Smoking at your clinic in the past 2 years ? *

- ☐ Yes
☐ No

Please specify the pharmacological treatment (eg varenicline, Nicotine Replacement therapy in any forms) : *

22 ITEMS QUESTIONNAIRE

Item 1-5

1. 'Assess' is the first component under 5A's of stop smoking clinical practice guidelines. *

- ☐ True
☐ False

2. 'Assign' is one of the components under 5A's of stop smoking clinical practices. *

- ☐ True
☐ False

3. 'Assist' is the subsequent component after you advice patient to quit smoking. *

- ☐ True
☐ False

4. 5R's is use for those who is unwilling to quit smoking at any time. *

- ☐ True
☐ False

5. 'Reusage' is the end component of 5R's framework of stop smoking clinical practice guidelines. *

- ☐ True
☐ False

22 ITEM QUESTIONNAIRES

Item 6-10

Select 1 Option ONLY for each statement *

	Strongly agree	Agree	Don't know	Disagree	Strongly disagree
6. I feel that my effort in helping smokers to quit is not well rewarded.	☐	☐	☐	☐	☐
7. Clinical practice guidelines are not relevant in improving patient smoking cessation.	☐	☐	☐	☐	☐
8. Repetition in giving advice on quit smoking to patients is beneficial.	☐	☐	☐	☐	☐
9. Framework in approaching chronic smoker is impractical.	☐	☐	☐	☐	☐
10. Every provider should be provided with algorithm on treating chronic smoker.	☐	☐	☐	☐	☐

22 ITEM QUESTIONNAIRES

Item 11-22

Select 1 Option ONLY for each statement *

	Always	Frequent	Seldom	Never
11. I will check when is the last time that my patient smoked.	☐	☐	☐	☐
12. I advise the smokers to quit.	☐	☐	☐	☐
13. I advise the smokers to reduce amount of cigarettes per day.	☐	☐	☐	☐
14. I inquire the smoker's willingness to quit.	☐	☐	☐	☐
15. I provide the smokers with practical counseling.	☐	☐	☐	☐
16. I give further follow-ups for smokers quitting.	☐	☐	☐	☐
17. I encourage the smokers to indicate why quitting is personally important.	☐	☐	☐	☐
18. I ask the smokers to identify any potential harm to self from smoking.	☐	☐	☐	☐
19. I ask the smokers to identify negative consequences of continuing smoking.	☐	☐	☐	☐
20. I ask the smokers to identify advantages of quit smoking to their family.	☐	☐	☐	☐
21. I ask smokers why quitting is impossible.	☐	☐	☐	☐
22. I continuously inform the smoker's benefits of quit smoking.	☐	☐	☐	☐