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The Implementation of Smoke-Free Workplace Policy and the Determinants Affecting Indoor Smoking in Indonesia

Abstract

A smoke-free workplace is important to reduce secondhand smoke exposure, raise awareness, encourage smoking cessation, and increase productivity. This study aimed to assess indoor smoking in the workplace as part of a smoke-free policy implementation and the factors associated. This was a cross-sectional study at workplaces in Indonesia from October 2019 to January 2020. The workplaces were divided into private workplaces owned by a company for business and government workplaces that run for public services. Samples were selected using stratified random sampling. Data collection follows time and area observation guidelines, starting in the indoor area and then outdoor. The observation was conducted for at least 20 min for each workplace in 41 districts/cities. Of the 2900 observed workplaces, 1097 (37.8%) were private and 1803 (62.92%) were government workplaces. The proportion of indoor smoking at government workplaces was 34.7%, higher compared to private (14.4%). The results were consistent for each indicator such as people smoking (14.7% vs. 4.5%), electronic cigarette use (0.7% vs. 0.4%), cigarette butts presence (25.8% vs. 9.5%), and smell of cigarette smoke (23.0% vs. 8.6%). The factors associated with indoor smoking were indoor ashtray availability (adjusted odds ratio [AOR] =13.7; 95% confidence interval [CI]: 10.6–17.5), indoor designated smoking area (AOR = 2.4; 95% CI: 1.4–4.0), presence of indoor tobacco advertising, promotion and sponsorships (AOR: 3.3; 95% CI: 1.3–8.89), whereas the presence of no smoking sign was a preventive factor (AOR = 0.6; 95% CI: 0.5–0.8). Indoor smoking remains high, particularly in government workplaces in Indonesia.

Keywords: Indonesia, smoke-free policy, smoking, tobacco control, workplace

Introduction

The prevalence of smoking based on Indonesian Basic Health Research (Riskesdas) 2018 among men aged 10 years and above was 55.8%, among women was 1.9% and overall was 28.9%. The majority of them (80.6%) were smoking in indoor spaces which results in passive smoking of other occupants of the space. As high as 75.5% of Indonesian were exposed to indoor secondhand smoke.^[1]

A smoke-free policy is a measure introduced to reduce secondhand smoke exposure. The Health Law No. 36/2009 and Government Regulation 109/2012 mandate subnational governments in Indonesia to adopt and implement tobacco control measures including smoke-free policy.^[2,3] By 2019, 397 of 514 districts/cities in Indonesia have been implementing a smoke-free policy by local law or regulation. For a successful implementation of a smoke-free policy, it is important to raise awareness of smoking

harm, prevent secondhand tobacco smoke exposure, and improve indoor air quality.^[4,5] A smoke-free workplace implementation leads to improving health outcomes of workers, increases productivity, and living in a smoke-free home.^[6-8]

The policy bans indoor smoking in seven types of areas including health facilities, education facilities, children's playgrounds, worship places, workplaces, public places, and public transportation. A smoke-free workplace policy is a part of the smoke-free law in Indonesia.^[2,3] The implementation should be strengthened based on evidence. This study aimed to assess indoor smoking in the workplace as part of a smoke-free policy implementation and the determinants associated with it.

Materials and Methods

Study design

This was a cross-sectional survey conducted from October 2019 to January 2020. The study population was

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workplaces in districts/cities that implement smoke-free laws in Indonesia. The workplaces were divided into private and government workplaces. Private workplaces are workplaces owned by the company for business such as banks, corporation offices, and private service offices. Government workplaces are workplaces that run for public services such as government offices and public services offices. The proportion estimation of indoor smoking in public workplaces (P1) was 32.5%, and in the private workplaces (P2) was 25% with a confidence level of 95% and power of 95%. Based on the calculation, a minimum of 944 workplaces of each type were to be included in this study.^[9]

Sampling was started by selecting 41 of 397 districts/cities that were implementing smoke-free laws. The district/city selection was based on sociodemographic variation and considered distribution by the province to gain representative sample. The next step was workplace selection at each selected district. The sample size in each district/city was proportional to the population of workplaces. The workplaces were selected using stratified random sampling. The stratified referred to the type of workplaces, private and government. A list of workplaces of each type was obtained from the office of investment and integrated services as sampling frames. The sample at each stratum was selected randomly using the resampling procedure in Stata Statistical Software: Release 12. College Station, StataCorp LP.

Data collection and analysis

Key variables observed were indoor smoking and the associated factors. Key indicators of indoor smoking were the presence of indoor smoking, indoor electronic cigarette use, indoor cigarette butt, and the smell of indoor cigarette smoke. The observation was done the front office, waiting room, workspaces, pantry, meeting room, balcony/corridor area (if any), restroom, canteen, and outdoor area. Indoor smoking was measured by anyone seen smoking or presence of one of the above indicators. The factors studied were indoor and outdoor no smoking sign, presence of ashtray, presence of a designated smoking area, and tobacco advertising, promotion, and sponsorships [TAPS].^[10]

A standard observation protocol was used for data collection. The consent for observation was provided only to the office manager. The workers and visitors did not have prior knowledge regarding the observation. The observation procedure was tailored for its requirements so that they are conducted at the peak time and natural setting of their activity.^[10] Each observation lasted for at least 20 min. The observation was conducted by checklist that was developed using an Open Data Kit (ODK) application. The checklist enabled the enumerator to take a photo and geolocation of workplaces. We trained 29 schools of public health students as enumerators to perform data collection. The training method is a 1-day training including a classroom

presentation to deliver key materials and followed by field practice to improve their observation skills.

Data were downloaded into Comma Separated Values (CSV) file from the ODK server and exported to STATA file. We performed a statistic descriptive, Chi-square test for indoor smoking comparison and logistic regression to assess the association between the factors and the presence of indoor smoking. Data were analyzed using statistical software the STATA SE 12.1.^[11,12]

Ethics approval

Ethical clearance was granted from the Ethical Committee of the Faculty of Medicine, Universitas Udayana, Indonesia, under the ethical approval letter: 2973/UN14.2.2.VII. 14/LP/2019. Formal permissions were obtained from the Bali Provincial Government under the recommendation letter: 070/09159/DPMPTSP-B/2019.

Results

The observation of indoor smoking

A total of 2900 workplaces were observed, comprising 1097 (37.8%) private and 1803 (62.92%) government, a ratio in population 1:2. The presence of indoor smoking at government workplaces was 14.7%, higher compared to private (4.5%). The presence of people using e-cigarette indoors in government workplaces was 0.7% compared to 0.4% in private. At government workplaces, indoor cigarette butt was noticed in 25.8% and cigarette smoke smell was sensed in 23.0%, whereas at private, these were 9.5% and 8.6%, respectively. Overall, the evidence of indoor smoking found at government workplaces was significantly higher compared to private ones [Table 1].

The observation of indoor smoking factors

The observation on the factors of indoor smoking was higher at government workplaces, presence of no smoking sign indoor (57.7%) and outdoor (18.8%) compared to private workplace indoor (25.6%) and outdoor (9.0%). We found more government workplaces provided ashtray indoors (19.7%) compare to private ones (10.4%), and the outdoors, it was not different. Both types of workplaces were not providing designated smoking areas but there were 3.9% indoor and 13.2% outdoor designated at the government workplaces, which was higher compared to private workplaces, (2.3% indoor and 3.9% outdoor). The presence of indoor TAPS was 1.4% and outdoor was 2.0% at government workplaces which were not very different from private workplaces [Table 1].

The factors associated with indoor smoking

Indoor ashtray provision was strongly associated with increased indoor smoking (adjusted odds ratio [OR] = 13.7; 95% confidence interval [CI]: 10.6–17.5; $P < 0.001$). Similarly, indoor designated smoking area was positively associated with indoor smoking (AOR = 2.4; 95% CI:

Table 1: The distribution of indoor smoking and its factors by type of workplace

Variables	Type of workplace		Total	P
	Private (n=1097)	Government (n=1803)		
The presence of indoor smoking	49 (4.5)	265 (14.7)	314 (10.8)	<0.001
The presence of indoor e-cigarettes use	4 (0.4)	12 (0.7)	16 (0.6)	0.289
The presence of indoor cigarette butt	104 (9.5)	465 (25.8)	569 (19.6)	<0.001
The smell of indoor cigarette smoke	94 (8.6)	379 (23.0)	473 (16.3)	<0.001
The number of indoor smoking indicators found				
0	939 (85.6)	1177 (65.3)	2116 (73.0)	<0.001
1	93 (8.5)	296 (16.4)	389 (13.4)	
2	37 (3.4)	167 (9.3)	204 (7.0)	
3	28 (2.5)	161 (8.9)	189 (6.5)	
4	0	2 (0.1)	2 (0.1)	
Indoor no smoking sign	281 (25.6)	1041 (57.7)	1322 (45.6)	<0.001
Indoor ashtray provision	114 (10.4)	356 (19.7)	470 (16.2)	<0.001
Indoor designated smoking area	25 (2.3)	70 (3.9)	95 (3.3)	0.019
Indoor TAPS presence	9 (0.8)	25 (1.4)	34 (1.2)	0.170
Outdoor no smoking sign	99 (9.0)	339 (18.8)	438 (15.1)	<0.001
Outdoor ashtray provision	148 (13.5)	238 (13.2)	386 (13.3)	0.823
Outdoor designated smoking area	43 (3.9)	146 (8.1)	189 (6.5)	<0.001
Outdoor TAPS presence	21 (1.9)	36 (2.0)	57 (2.0)	0.877

TAPS: Tobacco advertising, promotion, and sponsorships

1.4–4.0; $P = 0.001$) and the presence of indoor TAPS was associated with indoor smoking (AOR = 3.3; 95% CI: 1.3–8.9; $P = 0.016$). The outdoor no smoking sign resulted in lower indoor smoking (AOR = 0.6; 95% CI: 0.5–0.8; $P = 0.002$). Moreover, government workplaces had a higher probability of the presence of indoor smoking compared to private workplaces (AOR = 3.1; 95% CI: 2.5–3.9; $P < 0.001$) [Table 2].

Discussion

Indoor smoking in workplaces in Indonesia is still high and needs to decrease. After 4 years of implementation, it the compliance to workplace smoke-free policy should be a minimum of 90%.^[13] The presence of indoor smoking was higher among government workplaces compared to private workplaces. Government facilities are expected to be a role model for the implementation of the smoke-free policy.^[14] The observation of cigarette smoke smell was higher compared to the presence of people indoor smoking, particularly in government workplaces evidence of indoor smoking in the hidden or restricted rooms that could not be accessed by the observer. This indicates that the violation may come from their own employees or workers signifying low internal enforcement.

The presence of outdoor no smoking signs prevented indoor smoking. The signage informed and warned the visitor and demonstrated the seriousness of the smoke-free policy implementation. In line with a previous study, comprehensive smoking bans were given more support by smokers compared to partial smoking bans. The signage is one of the key successes of smoke-free policy implementation.^[15,16] The presence of indoor signage was

not an associated factor. This result may relate to the presence of indoor signage in government workplaces being higher but indoor smoking was also high. The manager and employee display the signage due to their obligation but the habit and norm of indoor smoking still continued.^[17] This finding shows that expanding the signage coverage to all workplaces is not enough. The implementation of the smoke-free policy should be supported by health promotion and a smoking cessation program.^[14] The managers have to be continuously informed and supervised to understand the concept, objective, and benefit of the policy. The knowledge will increase their awareness, support, and commitment.^[18]

Indoor ashtray provision, designated smoking area, and TAPS impact indoor smoking. This result is in line with the previous study that found the predictors of smoking behavior in public places are the presence of smoking aids (ashtrays, matchboxes, to be lighters).^[18] The three factors were higher in government workplaces compared to private workplaces. This result also explains the reason indoor smoking was higher among the government compared to private workplaces. Providing ashtrays and designated indoor areas is a violation of the policy and they facilitate people smoking. People and staff think that smoking is allowed when they see ashtrays and designated smoking areas in the building. Moreover, the presence of TAPS shows inconsistency and a lack of credibility in the smoke-free policy implementation. In line with a previous study, ashtrays or ashtray equivalent is a strong determinant of indoor secondhand tobacco smoke exposure. They recommend that enforcement should include the complete removal of ashtrays and other objects acting as cues for indoor smoking.^[16]

Table 2: Factors associated with of indoor smoking at workplaces in Indonesia

Variables	Indoor smoking		Simple logistic regression			Multiple logistic regression		
	No	Yes	Crude OR	95% CI	P	Adjusted OR	95% CI	P
Indoor no smoking sign								
No	1194 (75.7)	384 (24.3)	Reference					
Yes	922 (69.7)	400 (30.3)	1.3	1.1-1.6	<0.001	-		
Indoor ashtray provision								
No	2007 (82.6)	423 (17.4)	Reference					
Yes	109 (23.2)	361 (76.8)	15.7	12.4-19.9	<0.001	13.7	10.6-17.5	<0.001
Indoor designated smoking area								
No	2083 (74.3)	722 (25.7)	Reference					
Yes	33 (34.7)	62 (65.3)	5.4	3.5-8.3	<0.001	2.4	1.4-4.0	0.001
Indoor TAPS presence								
No	2108 (73.5)	758 (26.5)	Reference					
Yes	8 (23.5)	26 (76.5)	9.0	4.1-20.1	<0.001	3.3	1.3-8.9	0.016
Outdoor no smoking sign								
No	1778 (72.2)	684 (27.8)	Reference					
Yes	338 (77.2)	100 (22.8)	0.8	0.6-1.0	0.032	0.6	0.5-0.8	0.002
Outdoor ashtray provision								
No	1838 (73.1)	676 (26.9)	Reference					
Yes	278 (72.0)	108 (28.0)	1.1	0.8-1.3	0.654	-		
Outdoor designated smoking area								
No	1978 (73.0)	733 (27.0)	Reference					
Yes	138 (73.0)	51 (27.0)	1.0	0.7-1.4	0.987	-		
Outdoor TAPS presence								
No	2079 (73.1)	764 (26.9)	Reference					
Yes	37 (64.9)	20 (35.1)	1.5	0.8-2.6	0.169	-		
Type of workplace								
Private	939 (85.6)	158 (14.4)	Reference					
Government	1177 (65.3)	626 (34.7)	3.2	2.6-3.8	<0.001	3.1	2.5-3.9	<0.001

OR: Odds ratio, 95% CI: 95% confidence interval, TAPS: Tobacco advertising, promotion, and sponsorships

Indoor designated smoking areas represent manager misperception regarding the concept of the smoke-free policy. The policy aimed to make all indoor areas smoke-free because smoking is harmful but they may perceive that smoking is a right, normal activity and should be facilitated through designated smoking area indoor. This misperception should be corrected through intensive supervision. The local smoke-free law mandates the manager to be held responsible for the implementation and, when random inspections find such violations, appropriate penal actions should be taken.^[19] The successful implementation of smoke-free laws relies on optimal internal implementation and internal monitoring.

The limitations of this study are the ability to capture the real situation in 20–30 min observation and the bias due to the Hawthorne effect. The enumerators did not observe the workplaces throughout the work. This limitation was minimized by observing the peak time, the minimum particular area that should be observed, and using four measurable indicators of indoor smoking. The Hawthorne effect was minimized by providing informed consent only to the office manager. The workers and visitors did not have any information regarding the observation so the behavior will be in a natural setting. We did not have

information regarding the level and size of workplaces, gender distribution, locality (urban or rural), and other characteristics that are important in smoke-free policy implementation so we are unable to compare based on this aspect. This should be taken into account in future studies.

Conclusion

Indoor smoking remains high, particularly in government workplaces. It was promoted by ashtray provision, designated smoking area, and TAPS indoor. No smoking sign is an important factor that prevents indoor smoking. This study has important implications for Tobacco Control Program, particularly as evaluation provides evidence to prioritize the next strategies. Comprehensive strategies have to be simultaneously implemented, including mandatory no smoking signage, complete removal of ashtrays, designated smoking areas, TAPS elimination, internal monitoring, and manager supervision.

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Conflicts of interest

There are no conflicts of interest.

References

- Agency of Health Research and Development. National Report of Basic Health Research (RISKESDAS). Jakarta: Publishing Institute, Agency of Health Research and Development; 2018.
- President Republic of Indonesia. The Law of Republic of Indonesia Number 36 2009 Regarding Health. Indonesia: The Ministry of State Secretariat; 2009. p. 1-77. Available from: https://infeksiemerging.kemkes.go.id/download/UU_36_2009_Kesehatan.pdf. [Last accessed on 2022 Aug 27].
- Ministry of Law and Human Right Republic of Indonesia. Government Regulation Regarding Health. Indonesia: Ministry of Law and Human Right Republic of Indonesia; 2012. p. 1-27.
- Lee K, Hahn EJ, Riker C, Head S, Seithers P. Immediate impact of smoke-free laws on indoor air quality. *South Med J* 2007;100:885-9.
- Su CP, Syamlal G, Tamers S, Li J, Luckhaupt SE. Workplace secondhand tobacco smoke exposure among U.S. Nonsmoking workers, 2015. *MMWR Morb Mortal Wkly Rep* 2019;68:604-7.
- Nazar GP, Lee JT, Glantz SA, Arora M, Pearce N, Millett C. Association between being employed in a smoke-free workplace and living in a smoke-free home: Evidence from 15 low and middle income countries. *Prev Med* 2014;59:47-53.
- Schoj V, Alderete M, Ruiz E, Hasdeu S, Linetzky B, Ferrante D. The impact of a 100% smoke-free law on the health of hospitality workers from the city of Neuquén, Argentina. *Tob Control* 2010;19:134-7.
- Lim KH, Lim HL, Teh CH, Ghazali SM, Kee CC, Heng PP, *et al.* Is the implementation of smoke-free policies at workplaces associated with living in a smoke-free home? Findings from a national population-based study in Malaysia. *Tob Induc Dis* 2019;17:51.
- Lwanga S, Lemeshow S. Sample Size Determination for Health Study: A Practical Manual. Geneva: World Health Organization; 1997.
- International Union Against Tuberculosis and Lung Disease. Assessing Compliance with Smoke-Free Laws. Edinburgh: Tobacco Control Department; 2014.
- Hilbe JM. Practical Guide to Logistic Regression. First. New York: CRC Press; 2015.
- Mitchell MN. Data Management using STATA : A Practical Handbook. 2nd ed. Texas: StataCorp LLC; 2020.
- Verdonk-Kleinjan WM, Rijswijk PC, de Vries H, Knibbe RA. Compliance with the workplace-smoking ban in the Netherlands. *Health Policy* 2013;109:200-6.
- Jackson-Morris AM. The contribution of a 'whole of government' smoke-free policy on the island of St Helena. *Glob Health Action* 2019;12:1681756.
- Mons U, Nagelhout GE, Guignard R, McNeill A, van den Putte B, Willemsen MC, *et al.* Comprehensive smoke-free policies attract more support from smokers in Europe than partial policies. *Eur J Public Health* 2012;22 Suppl 1:10-6.
- Vardavas CI, Agaku I, Patelarou E, Anagnostopoulos N, Nakou C, Dramba V, *et al.* Ashtrays and signage as determinants of a smoke-free legislation's success. *PLoS One* 2013;8:e72945.
- Suarjana K, Astuti PA, Artawan Eka Putra IW, Duana MK, Mulyawan KH, Chalidyanto D, *et al.* Implementation of smoke-free law in Denpasar Bali: Between compliance and social norms of smoking. *J Public Health Res* 2020;9:1747.
- Goel S, Sharma D, Gupta R, Mahajan V. Compliance with smoke-free legislation and smoking behaviour: Observational field study from Punjab, India. *Tob Control* 2018;27:407-13.
- Kegler MC, Hua X, Solomon M, Wu Y, Zheng PP, Eriksen M. Factors associated with support for smoke-free policies among government workers in Six Chinese cities: A cross-sectional study. *BMC Public Health* 2014;14:1130.