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Implementation level indicators of public facilities in Surabaya to smoke-free area regulation

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ABSTRACT

Background and purpose: The regulation of smoke-free area in Surabaya was adopted since 2008 and amended in 2019. Hotel, restaurants, and cafes are smokefree dedicated area under the regulation. Therefore, it is very important to review the implementation level of smoke-free area regulations in public places such as hotels, restaurants and cafes. This study aims to analyze how strong the indicators that forms the implementation level of public facilities with smoke free area regulations in Surabaya.

Methods: This was a cross sectional survey carried out in 88 public facilities consisting of hotels and restaurants between June-August 2021. Confirmatory Factor Analysis (CFA) was carried out with the Analysis of Moment Structures (AMOS) Application to test the strength of each smoke-free area monitoring indicators that forms the implementation level of these public facilities. These indicators include: awareness of smoke-free area regulations, smoke-free area internal promotion, installation of smoke-free signs, no colaboration with tobacco industries, no violations and owning an internal policy related to smoke-free.

Results: There were three strong indicators that are strongest in shaping smoke-free area implementation level at public facilities in Surabaya, including awareness of smoke-free area regulations (CFA 4.681), smoke-free area internal promotion (CFA 2.609) and installing a smoke-free sign (CFA 1.000). Meanwhile, the other three indicators showed weak association.

Conclusion: Awareness of smoke-free area regulations, smoke-free area internal promotion and installation of smoke-free sign were the strong indicators for smokefree law (SFL) implementation. It is important to push for more internal dissemination involving cross sectors and improve other indicators.

Keywords: smoke-free area, implementation level, public facilities, confirmatory factor analysis

INTRODUCTION

Cigarette consumption is one of the main risk factors for non-communicable diseases such as coronary heart disease, stroke, cancer, chronic lung disease and diabetes mellitus which are the main causes of death in the world, including Indonesia. In Indonesia there has been a shift in the death rate where in 1990 most deaths were caused by communicable diseases, but in 2017 this pattern shifted where most of the deaths were caused by non-communicable diseases. Deaths caused by non-communicable diseases occur due to changes in people's lifestyles, including smoking behavior.[1]

Currently, more than 60 million of Indonesian people are active smokers. This number continues to grow from year to year and puts Indonesia in the third rank with the highest number of active smokers in the world. As many as 62 million women and 30 million men in Indonesia become passive smoker, and more worrying that children aged 0-4 years who are exposed to cigarette smoke are as many as 11.4 million. The results of the 2018 Indonesian Basic Health Research found that child and adolescent smokers rose to 9.1%. Although the dangers of smoking are very clear, the prevalence of smokers in Indonesia continues to increase.[2]

In 2007, Indonesia was the 7th largest smoking country in the world; however, in 2015 Indonesia ranks as the 3rd largest smoking country in the world after China and India.[3] In 2006, the prevalence of smokers aged 13-15 years was 24.5% among men and 2.3% among young women in Sumatra and Java. The survey shows 19.2% of students were smoking, 35.6% of male and 3.5% of female. As many as 81.1% of teenage smokers have tried to quit smoking in the last 12 months and as many as 80.8% of teenage smokers want to quit smoking.[4]

Smoking inside the building or house can be dangerous and people around them become passive smokers. A recent study by a researcher from King's College London explains that 50% of passive smokers are at risk of mouth and throat cancer. If family members in the house or building are exposed to cigarette smoke in the long term, the risk will increase many times.[5] No less dangerous is the third hand smoke where a study states that after someone smokes indoors, the nicotine residue will stick to the surface of walls, clothes, floors, furniture and others. The nicotine residue can enter the body of peoples who enter the room indirectly through skin absorption, consumption of food contaminated with nicotine residue or through nose and mouth inhalation.[6]

The establishment of a smoke-free area is an effort by the government to protect the public from other people's cigarette smoke and to ensure the right of everyone to breathe clean and healthy air without exposure to cigarette smoke.[7] The Bill of the Republic of Indonesia Number 36 Year 2009 concerning Health mandates the subnational government to adopt smoke free regulation.[8] Surabaya City initiated the regulation of smoke-free area through the Surabaya City Bylaw Number 5 Year 2008 concerning smoke-free area and smoking restricted area. In 2019, the regulation was amended to become the Surabaya City Regional Regulation Number 2 of 2019 concerning smoke-free area.

The implementation of this regulation has been carried out in stages starting from information dissemination and monitoring in 2014 to 2017 when monitoring of smoke-free area was carried out in health and educational facilities. In 2018, dissemination began at the Department of Transportation, installation of the smoke-free sticker on public transportation, while health and education facilities were monitored. In 2019 until now, they have started to carry out dissemination in facilities for places of worship, hotels, restaurants, cafes, malls, and others.[9]

In the Surabaya City Regional Regulation Number 2 Year 2019[9] and Mayor Regulation Number 110 2021[10] concerning guidelines for the implementation of the smoke free bylaw, public facilities such as hotels, restaurants and cafes are dedicated as smoke free public place facilities. Therefore, the manager of public

facilities has the responsibility to implement the rules of the smoke-free area. Implementing smoke-free area are necessary to prevent secondhand smoke exposure and to improve visitors' convenience.

The process of monitoring smoke-free area in Surabaya was conducted by observation and interviews where several indicators were documented. There are six indicators which are important points that assess the level of implementation at public facilities including 1) awareness of smoke-free area regulations, 2) smoke-free area internal promotion, 3) installation of smoke-free sign, 4) no cooperation with tobacco industries, 5) no violations and 6) presence of an internal policies related to smoke-free environment. From the monitoring results, few facilities showed 100% compliant with smoke-free area regulations in Surabaya. Therefore, the researchers view it is necessary to analyze how strong each indicator constructed the implementation level of smoke-free regulation in Surabaya, so level of implementation can be improved in the future and then it should improve the air quality and reduce smoke exposures. This study aims to measure the strength of smoke free regulation implementation indicators to predict the level of education with confirmatory factor analysis.

METHODS

This was an analytical cross-sectional study. Data collection was carried out by observation and interviews using instruments that contain indicators of smoke-free area implementation level during random monitoring of 88 public facilities in Surabaya consisting of hotels, restaurants and cafes by Universitas Airlangga and Tobacco Control Support Center (TCSC) East Java team between June-August 2021. Monitoring was carried out either together with the Surabaya City Health Office or independently by the Surabaya smoke-free area task force team. The indicators are (1) awareness of smoke-free area regulations, (2) smoke-free area internal promotion, (3) installation of smoke-free sign, (4) no cooperation with tobacco industries, (5) no violations, (6) presence of an internal policies related to smoke-free environment.

For this study, we chose hotels, restaurants and cafes to be monitored based on a preliminary study that shows hotels, restaurants and cafes are public places that support tourism, which in majority allow large numbers of people to smoke and if not regulated through regulations in smoking-free area will have negative health consequences.

The data that has been collected is inputted into SPSS application to facilitate the analysis process. Data from SPSS then were analyzed with Analysis of Moment Structures (AMOS) application to perform Confirmatory Factor Analysis (CFA). The CFA tests how strongly each indicator variable can form the implementation level of these public facilities. All of the indicators above are measured in the following way: (1) Each of 8 indicators were given a score. If the answer "Yes", it will get a score of 12.5%, while if "No", it will get a score of 0%, with the hope that the total score will be 100% if the public facility meets the criteria. (2) In the analysis, the researcher removes two indicators namely application of smoke-free area regulations and special officer indicators so that only six indicators were tested through the CFA with AMOS. The reason for the exclusion of the two indicators above was because the indicators application of smoke-free area regulations becomes meaningless when there are other variables with contradictory results. Meanwhile, special officer is an indicator variable that is not mandatory, so it will burden public facilities if this variable becomes a mandatory indicator. The definition of each indicator is described in Table 1.

This research was approved by Universitas Airlangga, Faculty of Dental Medicine with Health Research Ethical Clearance number 353/HRECC.FODM/III/2023.

Table 1. Definition of smoke-free area implementation level indicators

Number	Indicator	Operational Definition	Scale
1.	Awareness of the smoke-free area regulations	Respondents' knowledge of the existence of a smoke-free regulation in Surabaya	Nominal (Yes/No)
2.	Smoke-free area internal promotion	Internal dissemination of smoke-free regulation carried out by managers to employees either through meetings, briefings or during employee recruitment	Nominal (Yes/No)
3.	Installation of of smoke-free sign	Smoke-free sign installed when the team visited the facility	Nominal (Yes/No)
4.	No cooperation with tobacco industries	Does not cooperate with tobacco industries	Nominal (Yes/No)
5.	No violations	No violation to the smokefree area regulation. Compliance indicators include: no cigarette butts, no cigarette ashes, ashtrays, no people smoking, no smell of cigarettes are found, no smoke-free sign, no smoking room indoors.	Nominal (Yes/No)
6.	Presence of an internal policies related to smoke-free environment.	Policy adopted by the venue management to implement and support smoke free regulation. This internal policy is not mandatory, but if this public facility has an internal policy, then the implementation of a smoke-free area will be better	Nominal (Yes/No)

RESULT

Based on Table 2, it can be seen that the highest average value was found for the indicator of no cooperation with cigarette industries and the lowest is the presence of a policy related to smoke-free area in the internal environment. Then, there were indicators that showed high average value including installation of smoke-free sign, smoke free internal promotion and awareness of the smoke-free regulation. It reflects that these indicators are considered and become attention of public facilities in Surabaya.

Meanwhile, the indicators "Instalation of smoke-free sign" and "No violations" have the same standard deviation of 4.7273. This phenomenon is likely to occur due to multicollinearity or correlation between indicators where when the public facilities installed smoke-free sign, visitors are more likely to comply, so it reduces the violation.

The following analysis carried was CFA which results is shown in Figure 1. Based on the CFA analysis on indicators of implementation level, there are 3 indicator variables that are the strongest forming implementation level of regulation of smoke-free area in public facilities in the Surabaya, first indicator is, awareness of smoke-free area regulation with an estimate value of CFA 4.681 which means this indicator is the strongest influencing the implementation level of public facilities to smoke-free area regulation in Surabaya. The second strongest indicator that forms the implementation level of public facilities to smoke-free area regulation is smoke-free area internal promotion with an estimate value of CFA 2.609. Meanwhile, the third strongest indicator that forms the implementation level of public facilities with regulations for smoke-free area

is installation of a smoke-freesmoke-free sign with an estimated value of CFA 1.000.

Table 2. Descriptive analysis of each implementation level indicator

Indicators	Average	Standard Deviation
Awareness of the Smoke-Free Area Regulation	5.68	6.26
Smoke-free area internal promotion	7.81	6.09
Installation of smoke-free sign	10.37	4.73
No cooperation with tobacco industries	12.22	1.87
No violations	10.37	4.73
Presence of an internal policies related to smoke-free environment	3.98	5.86

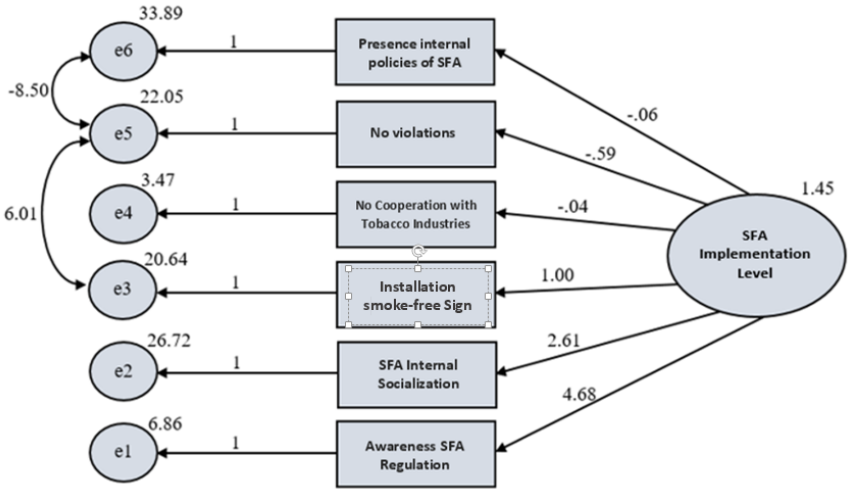

Figure 1. CFA analysis with the AMOS application

Table 3 shows statistically significant indicators at the 5% level of significance as forming the variable of implementation level with smoke-free area regulation are installation of smoke-free sign and smoke-free area internal promotion. Although the awareness of smoke free area was pretty dominant, however it was not statistically significant. This happens because the standard error (SE) of this indicator is high, thus allowing for a higher bias.

The CFA model in Figure 1 above has a good level of model fit with several indicators of the model fitting index described in Table 4. The results of the model fit indicators in Table 4 shows the model was fit for CFA analysis marked by many indicators that are in accordance with the standard cut off value of the fit model. The results of this CFA analysis can be concluded that the dominant indicators in forming the variable of implementation level with smoke-free area regulation are installation of smoke-free sign, awareness of smoke-free area regulations and smoke-free area internal promotion.

Table 3. The loading factor value of CFA results on the AMOS application

Indicators			Estimate	S.E.	C.R.	p
Awareness of The SFA Regulation	<---	SFA implementation level	4.681	3.016	1.552	.121
Smoke-free area internal promotion	<---	SFA implementation level	2.609	1.264	2.065	.039
Installation of smoke-free sign	<---	SFA implementation level	1.000	-	-	-
No cooperation with tobacco industries	<---	SFA implementation level	-.042	.182	-.230	.818
No violations	<---	SFA implementation level	-.594	.588	-1.010	.312
Presence of an internal policies related to smoke-free environment	<---	SFA implementation level	-.056	.567	-.100	.921

SE=standard error, CR=critical ratio

Table 4. CFA model fitting index

Fit Model Indicator	Indicator Value	Cut of Value	Conclusion
Significance	0.337	≥0.05	Model fit
GFI (Goodness Fit Index)	0.971	≥0.90	Model fit
CMIN/DF (The Minimmum Sampel Discrepancy Function)	1.136	≤2	Model fit
CFI (Comparative Fit Index)	0.973	≥0.94	Model fit
TLI (Tucker-Lewis Index)	0.943	≥0.95	Model doesn't fit

Source: Hair Jr JF, 2020[11]

DICUSSION

Public facilities such as hotels, restaurants and cafes are places where smokers usually gather which increased exposure to cigarette smoke which will have negative impact and cause many health consequences. As part of the measure to reduce this problem, the Surabaya City Government has established the Surabaya City Regional Regulation Number 2 of 2019 concerning smoke-free area where this regulation also regulates the prohibition of smoking in public facilities.[9] Most hotels in Indonesia, especially in Surabaya, still apply smoking and non-smoking rooms, and some hotels have no regulation at all so guests are still allowed to smoke anywhere indoors. Meanwhile for restaurants and cafes, drinking coffee has been widely known that usually accompanied by smoking.[12]

From our analysis, indicators with high influence to level of implementation of smoke free area regulation was awarenees of the smoke free regulation with an estimate value of CFA 4,681 which means this indicator is the strongest influence of the implementation level of public facilities to the regulation of smoke-free area in Surabaya. Knowledge is the result of "knowing", and this occurs after people have sensed a certain object. Sensing occurs through the five human senses, namely the senses of sight, hearing, smell, taste and touch.[13] The other research are in line with the theory that there is a relationship between the level of knowledge and community implementation level. It can be seen that a person's broader knowledge will have a greater level of implementation level because knowledgeable people will assume that cigarettes and cigarette smoke can disturb other people and their surroundings, so that person will have a feeling not to smoke anywhere.[14] Massive and continuous promotion related to the regulation must be conducted by the Surabaya City Government through the smoke-free area Task Force Team. The promotion will improve public awareness to the regulation which in turn should improve implementation and compliance. Public facilities management should also become a target to improve implementation at public facilities.

The second strongest indicator variable that affects the implementation level of public facilities in Surabaya was smoke-free area internal promotion with an estimate CFA value of 2,609. Promotion of the regulation is connected to the awareness of the regulation. Another study states that promotion is an important aspect in the implementation of regional regulations. It is also important to involve the community in the whole process of developing the Regional Regulations for smoke-free area to understand the dangers of inhaling cigarette smoke.[15] Based on our finding, it is expected that the management of public facilities continue promotion of the regulations for smoke-free area in the internal environment both to employees and their families, also to the visitors of the facilities, so that public awareness of the smoking's dangers and the importance of implementing smoking-free area in public facilities can be increased.

The third indicator that affects the implementation level of public facilities in Surabaya was installation of smoke-free sign with an estimated CFA value of 1,000. This estimate value was deliberately locked at the beginning of the CFA analysis because according to the Smoke-Free Area Task Force Team in Surabaya, the presence of a no smoking sign is a sign of implementation level with smoke-free area regulations. The act of installation a smoke-free sign is the realization of knowledge and attitudes towards smoke-free area regulations into a real action. Action is also a person's response to a stimulus in a real or open form.[13] The response to the stimulus is obvious in the form of an action or practice, which is easily visible or visible to others therefore it is also called over behavior. A study states that the availability of smoke-free sign is an important criterion in the implementation of the smokefree area regulation. Visually, the installation of a no-smoking sign is also very important to raise public awareness for law and order, and not smoking in public facilities.[16]

The fourth indicator was no cooperation with tobacco industries, with an estimated CFA value of -.056 meaning that this indicator does not shape the level of SFA implementation. When the public facility cooperates with the tobacco industry it does not mean that the facility does not comply with regulations in a smoke-free area. However, the Surabaya City government can seek cross-sector participation to provide education regarding healthier product sponsorship collaborations. A study stated cigarette advertisements that have an influence on smoking behavior in urban areas show that teenagers' perceptions of the design and content of the cigarette advertisements they see can influence their desire to smoke.[17] Other study found 50.27% of children stated that cigarette advertising influences cigarette consumption, therefore efforts are needed to limit or prohibit cigarette advertising either through print media, broadcast media, and information technology media.[18]

Then there was the fifth indicator which is no violations to the law. It is important that there are no violations, but this does not mean that the public facility has complied with the smoke-free area regulations, it

could only be if there is an inspection that the facility is clean of violations. When an SFA inspection is carried out, you still need to see whether no smoking sign have been put up. Promotion of regulations regarding smoking-free areas also needs to continue so that people can understand the dangers of cigarette smoke for themselves and others.

Meanwhile, the sixth indicator presence of an internal policies related to smoke-free environment, at this stage is not mandatory because large public facilities usually have internal policies such as hotels or malls, while small public facilities such as restaurants and cafes rarely have internal policies regarding smoking-free areas. This is the reason that the existence of this indicator has a weak value but still must be present to assess the level of implementation of public facilities. However, at the level of small public facilities such as restaurants and cafes, they can appoint an employee who can be responsible for SFA so that the implementation of SFA in their area can be maintained. Internal system will improve implementation of such regulation, which should be encouraged in the future

Basically, in addition to monitoring public facilities as one of the smoke-free area in Surabaya, continuous promotion needs to be carried out to create knowledge-based attitude and behaviour in the community towards the regulation of smoke-free area in Surabaya. A research stated that behavior based on knowledge will be more durable than behavior that is not based on knowledge.[19] Our common hope for better implementation of smoke-free area is to increase awareness at various levels of society and through program support from the central and regional governments direction.

There were wide variations of the public facilities in term of resources and value, which somehow influence the implementation hence the determination of the standard across facilities was quite difficult. Therefore, the researchers selected indicators that accommodate all type of facilities. In the future, indicators may be tailored based on type of facilities and include resources as one of the indicators.

CONCLUSION

From our CFA, there were three strongest indicator variables that forms the implementation level of smoke-free area regulation in public facilities in Surabaya; awareness of smoke-free area regulations, smoke-free area internal promotion and installation of smoke-freesmoke-free sign. The spirit of smoke-free area regulations is not only law enforcement but also education that provides knowledge to the public. Promotion still needs to be carried out massively and continuously so that the knowledge of the people of Surabaya on the importance of a smoke-free area can increase so that it can bring up real attitudes and actions in its internal environment and implementation level with regulations on smoke-free area in Surabaya can be improved.

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AUTHOR CONTRIBUTION

Research conception and design: DC and DI; permission for data use and analysis suggestions: SM and KDA; statistical analysis of data: DC, DI and KDA; interpretation of DC and DI data; screenwriting: DC; English Translation: RDN

CONFLICT OF INTEREST

No conflicts of interest to be declared.

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