# Intervensi Terpadu Pengurangan Dampak Buruk Asap Rokok pada Ruangan Berpengatur Udara di Lingkungan Universitas Sriwijaya

## INTEGRATED INTERVENTION OF HARM REDUCTION OF SMOKE IN THE AIR CONDITIONED ROOMS IN SRIWIJAYA UNIVERSITY

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### Abstract

*Sriwijaya University is a workplace and learning places which requires to be smoking-free areas. Most of the rooms were designed as closed-air conditioned so it can be harmful if there were smoking activity there. This study aimed to test the effectiveness of the integrated intervention of smoke harm reduction in closed space/air-conditioned rooms in the Sriwijaya University environment. Eighty one University employees were selected as respondents based on a cluster random sampling method. The intervention included interactive counselling, candy cigarette substitutes, and short messages text (SMS) of health promotion. Data analysis used was paired t test. The results indicated that the integrated interventions provided significant changes to knowledge and attitudes towards smoking in the closed spaces/air-conditioned rooms after the intervention (p-value = 0.002 and 0.016). Statistically, however, the behaviour has no difference in average scores of 12.89 and 12.78 respectively before and after intervention. To sum up, there is a need of a comprehensive and long-term interventions related to smoking behaviour changes in Sriwijaya University. In addition, a regulation related to smoke-free area in Sriwijaya University is urgently needed to protect passive smokers from the negative impacts of smoking activities.*

*Keywords: air-conditioned room, harm reduction, smoke-free area,*

### Abstrak

Universitas Sriwijaya merupakan kawasan tempat kerja sekaligus tempat proses pembelajaran yang seharusnya membuat kawasan bebas asap rokok. Sebagian besar ruangan didesain tertutup dan berpengatur udara Air Conditioning (AC) sehingga dapat menyebabkan dampak buruk jika ada aktivitas merokok di dalamnya. Penelitian bertujuan untuk menguji efektivitas intervensi terintegrasi pengurangan dampak buruk asap rokok pada ruangan tertutup /ber-AC di lingkungan Universitas Sriwijaya. Sebanyak delapan puluh satu pegawai Universitas Sriwijaya diambil sebagai responden menggunakan teknik cluster random sampling. Intervensi yang diberikan meliputi konseling interaktif, permen pengganti rokok dan pesan singkat promosi kesehatan. Analisis data menggunkan uji t berpasangan. Hasil menunjukkan bahwa Intervensi terintegrasi ini memberikan perubahan yang signifikan terhadap pengetahuan dan sikap terhadap aktivitas merokok di ruang tertutup/ber-AC setelah intervensi (p-*value* = 0.002 dan 0.016. Secara statistik, perilaku sebelum dan setelah intervensi tidak memiliki perbedaan yang signifikan dengan rata-rata skor (masing-masing 12.89 dan 12.78). Oleh Karena itu, diperlukan intervensi yang komprehensif dan berkelanjutan dalam mengubah perilaku merokok di Universitas Sriwijaya. Selain itu, diperlukan terkait kawasan tanpa rokok untuk melindungi perokok pasif dari efek negatif aktivitas merokok.

Kata kunci: Kawasan Tanpa Rokok, ruangan ber-AC, pengurangan dampak

## INTRODUCTION

According to the World Health Organization (WHO), smoking behaviour is a risk factor of eight diseases that cause death in the world. The cumulative number of deaths from smoking is predicted to reach 175 million of the world's population. Generally, two-thirds of smokers live in 10 countries, including Indonesia which ranked third among the world population.[1,2] In Indonesia, 384,058 people suffer from disease related smoking behaviour and 12% die from smoking.[3] Cigarette smoke accounts for the death of one out of eight passive smoker to every eight people who die from smoking. In 2011, the Tobacco Atlas noted that passive smoking accounts for at least 600,000 deaths and 75% of these deaths are women and children.[4] Smoking behaviour impacts on the health of active and passive smokers.[1,2,4]

Two smoke-free are learning and teaching, and working areas[5,6]. Some studies, addressing smoke-free areas in teaching and learning and the work place, concluded that the application of smoke-free areas were able to reduce smoking habits of teachers, students, and workers. More females agreed with the implementation of smoke-free area comparing to males. The greater one's knowledge about the dangers of smoking correlated positively with support for the policy of smoke-free area. In addition, perception and a positive attitude towards smoke-free area policy contributed to a person's compliance.[7,8] Furthermore, there are significant differences of smoking behaviour among male respondents in Ogan Ilir-South Sumatera between intervention group of smoking cessation and non-intervention group.[9]

On December 8, 2010, the Rector of Sriwijaya University (UNSRI), signed Sriwijaya University's commitment to the establishment of smoke-free area. Nearly four years on, the implementation of these commitments have not been optimal. In order to give a solution for smoking behaviour in UNSRI, integrated interventions have been performed in the University environment. Through this research, it is hoped to encourage the implementation of the rector's regulation of smoke-free areas in Sriwijaya University beginning with no smoking in closed and air-conditioned areas. This research was conducted in 2015 with the aim to test the effectiveness of the integrated intervention modelling of harm reduction of smoke in the closed space/air-conditioned room in the UNSRI environment.

## MATERIALS AND METHODS

Randomised controlled trials were undertaken in this study. Knowledge, attitudes, perception, and behaviours related to smoking and smoke-free areas were measured before and after the integrated intervention of harm reduction of cigarette smoke in enclosed spaces/air- conditioned rooms on the campus of the UNSRI Indralaya-Ogan Ilir-South Sumatera-Indonesia.

The population in this study were the employees at the five faculties in UNSRI, including Faculty of Public Health, Faculty of Mathematics and Natural Sciences, Faculty of Law, Faculty of Engineering and Faculty of Computer Science. Participants were ascertained using cluster random sampling technique. From ten faculties in UNSRI, five faculties are chosen randomly as a cluster. The number of samples taken in each cluster were 15-21 respondents; dependant on the number of employees in each cluster, the more employees, the more number of respondents in each cluster and vice versa. Therefore, the total sample was 81 respondents.

The research consisted of three stages: pre-test, intervention, and post-test. During pre-test, the collected data were the image characteristics and knowledge, attitudes and behaviours of smoking, the number of employees per unit/agency/working parts, and a list of employee names. The intervention programme was conducted for one month at the five selected units/bureaus/working parts. Interventions used in this study adopted the approach used by the world Disease Control Centre (CDC) in an effort to control tobacco (smoking cessation). Intervention programmes undertaken included individual health counselling, health promotion related to smoke-free areas and the benefits on smoke-free areas in each faculty, a reminder of health promotion words via short text (SMS), cigarette substitution for mint candy or other candies, and ice-breaking activities.

After the intervention, the post test was performed through spreading questionnaires developed based on previous research related to the topic. Reliability and validation of the questionnaire was conducted in two institutions

in Sriwijaya University: research centre and community empowerment centre. The quantitative data collected included demographic variables (age, education, socioeconomic status), and variables of knowledge, perceptions and attitudes, and smoking behaviour. Data processing was performed using SPSS. Data analysis of univariate and bivariate used independent t test (dependent sample t test). Calculation of mean difference, 95% confidence interval and significance (p-value) were performed to determine the magnitude of changes in some variables before and after the intervention.

## RESULTS

### *Smoker Characteristics*

The majority of smokers were graduates from high school/vocational school/equivalent background. Respondents had worked from a range of 5 years to 40 years. More than 60% of respondents were married, with an average of two children. Respondents generally started to smoke early, at an age of 16 years (10-28 years) and smoked every day at the age of 19 years (10-30 years) (see Table 1). The respondents' knowledge about the importance of smoke-free areas and negative impact of long term smoking in closed or air conditioned areas increased before and after interventions by a proportion of about 5-25%.

The proportion of perceptions regarding the application of smoke-free areas, especially in an enclosed space and air- conditioned did not different significantly before and after the intervention. The total percentage of agree and strongly agree was almost the same (over 80%).

Respondents' attitudes toward smoking behavior in the study experienced a difference of 10-20% before and after the intervention. More than 70% of respondents expressed the attitude that smoking is an unhealthy culture and results in a bad image. They agreed that the behavior of smoking should be prohibited in their room before and after the post-test.

There were differences in the last month's smoking behavior before and after intervention. The percentage of smoking every day in the last month declined 28% after the intervention. There was also an increase in smoking behaviour in the outdoors for about 16% after the integrated interventions were implemented (see Table 2). In addition, most respondents agreed with a regulation of smoke-free areas in UNSRI.

### *Bivariate Analysis*

Knowledge before and after the intervention had an average difference of scores (42.13 and 44.28 respectively). There is a weak correlation between knowledge of smoke-free areas and negative impacts of smoking before and after the intervention. In the general population, we believe that the difference in mean 95% were in the range -3.405 (knowledge before intervention is reduced compared to 3.405 ‾after the intervention) and -0.895 greater than after the intervention.

Perception before and after the intervention has no difference in average scores (31.17 and 30.96 respectively); however, there is a moderate correlation between perception and positive pattern before and after the intervention. In the general population, we believe that the difference in mean 95% were in the range -1.239 (1.239 diminished the perception before the intervention compared with after the intervention) and 1.659 greater than after the intervention.

## Table 1. Smokers' Characteristics in Sriwijaya University

| Variable | Frequency | Proportion (%) |
|---|---|---|
| **Age** | | |
| >32 years | 39 | 48.1 |
| ≤ 32 years | 42 | 51.9 |
| Median (range) | 32(19-57) | |
| **Education** | | |
| Elementary School | 1 | 1.2 |
| Junior High School | 6 | 7.4 |
| Senior High School | 55 | 67.9 |

| | | | |
|---|---|---|---|
| DI/D3 | 6 | | 7.4 |
| College | 13 | | 16 |
| **Length of Working** | | | |
| ≤ 5 years | 42 | | 51.9 |
| >5 years | 39 | | 48.1 |
| Median (range) | 5(5-40) | | |
| **Marital Status** | | | |
| Single | 30 | | 37 |
| Married | 50 | | 61.7 |
| Divorced | - | | - |
| Widowed | 1 | | 1.2 |
| **Wife Job Status** | | | |
| not-working | 34 | | 66.7 |
| working | 17 | | 33.3 |
| **Total Children** | | | |
| >2 children | 23 | | 45.4 |
| ≤ 2 children | 28 | | 54.6 |
| Median (range) | 2(0-5) | | |
| Age of smoking initiation (median, range) | | 16(10-28) | |
| Age of smoking initiation everyday (median, range) | | 19(10-30) | |

## Table 2. Smoking Behavior Before and After Interventions

| No | Questions | Pre test | | Post test | |
|---|---|---|---|---|---|
| | | Total (n=81) | % (100%) | Total (n=81) | % (100%) |
| 1 | **Smoking Last Month** | | | | |
| | Yes, everyday | 47 | 58 | 26 | 32.1 |
| | Yes, sometimes | 14 | 17.3 | 22 | 27.2 |
| | No, but previously | 3 | 3.7 | 18 | 22.2 |
| | Never | 17 | 21 | 15 | 18.5 |
| 2 | **Ever invite/influencing friends/other people to smoke (Yes)** | 12 | 14.8 | 11 | 13.6 |
| 3 | **Ever remind/inviting friends/other people to not smoke (Yes)** | 44 | 54.3 | 40 | 49.4 |
| 4 | **Desiring to quit smoking** | | | | |
| | Yes, it has stopped | 15 | 18.5 | 16 | 19.8 |
| | Yes, it will stop | 59 | 72.8 | 62 | 76.5 |
| | No | 7 | 8.6 | 3 | 3.7 |
| 5 | **When does smoke while in the office** | | | | |
| | During at break | 77 | 95.1 | 73 | 90.1 |
| | While at work | 4 | 4.9 | 8 | 9.9 |
| 6 | **How often people smoke close to you in a closed room** | | | | |
| | Yes, everyday | 23 | 28.4 | 16 | 19.8 |
| | Sometimes | 41 | 50.6 | 52 | 64.2 |
| | Never | 17 | 21 | 13 | 16 |
| 7 | **Agree with the policy of smoke-free Area** | | | | |
| | Yes | 74 | 91.4 | 78 | 96.3 |
| | No | 7 | 8.6 | 3 | 3.7 |

| 8 | **Number of cigarettes smoked (median, range)** | | | |
|---|---|---|---|---|
| | Last 1 week | 84(2-224) | | 42 (1-224) | |
| | Yesterday | 12(1-32) | | 7(0-32) | |
| 9 | **The location is usually smoked** | | | | |
| | In the room | 5 | 8.2 | 3 | 5 |
| | In front of the room | 7 | 11.5 | 2 | 3.7 |
| | Outdoors | 49 | 80.3 | 49 | 90.7 |

**Table 3. Knowledge, Perceptions, Attitudes and Behaviors Related to smoke-free Area in Enclosed and Air-Conditioned Room**

| No | Variable | Category | N | Mean | Mean Difference | Correlation | CI 95% Lower | upper | P |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Knowledge | Before | 81 | 42.13 | -2.150 | 0.336 | -3.405 | -0.895 | 0.002 |
| | | After | 81 | 44.28 | | | | | |
| 2 | Perceptions | Before | 81 | 31.17 | 0.210 | 0.456 | -1.239 | -1.659 | 0.774 |
| | | After | 81 | 30.96 | | | | | |
| 3 | Attitudes | Before | 81 | 25.25 | -1.580 | 0.444 | -2.857 | | 0.016 |
| | | After | 81 | 26.83 | | | | -0.303 | |
| 4 | Behaviours | Before | 81 | 12.89 | 0.111 | 0.156 | | | 0.843 |
| | | After | 81 | 12.78 | | | -1.000 | 1.222 | |

Respondents' attitudes before and after the intervention had an average difference of scores (25.25 and 26.83 respectively). There is a moderate correlation between attitude and positive pattern before and after the intervention. In the general population, we believe by 95% that the mean difference ranges from -2.857 (attitude before intervention is reduced compared to -0.303 after the intervention).

Respondents' behavior before and after the intervention has no difference in average scores (12.89 and 12.78 respectively). There is a weak correlation between the positive and patterned behaviors before and after intervention. In the general population, we believe that the difference in mean of 95% were in the range -1.000 (behavior before the intervention reduced compared to 1.000 after the intervention) and 1.222 greater than after the intervention (see Table 3).

## DISCUSSION

The findings in this study in which the first age of the respondents was smoking at the age of adolescence (16 years) and the average respondent actively smoking since the age of 19 years. In the bivariate analysis, there were significant changes in knowledge and attitudes toward smoke-free areas in an air conditioned room; however, there was no considerable difference in the average scores of perception and behavior before and after the intervention

The Indonesian Ministry of Health, through the Basic Health Research in 2013, noted there was no significant reduction in numbers of smokers, aged over 15 years old, in Indonesia – about 34.2% in 2007. This figure tended to increase (36.6% of all household members) among 30,000 respondents in 33 provinces in 201310. The majority of active smokers is aged from 20 years old, are males, have lower to higher levels of education, and work in private and government sectors, and non-formal sectors e.g., farmers, fishermen and labourers. In South Sumatera, there were 29.7% active smokers among 9,575 respondents. Distribution of smoking behavior has increased in people with low socio-economic level.[4,11] Most respondents in this study came from high school- to lower education backgrounds. A study of a group of teenagers in Germany showed a significant relationship between education levels and smoking behaviour.[12] On the other hand, amongst a group of adults in China, the employment status of respondents was reported as influencing the smoking behaviour of individuals.[13] The findings in this study revealed that the number of smokers is quite high in those who did not work and have retired. Most respondents in this

study were married13. Another longitudinal survey showed a change in smoking behavior, at baseline and final data, among respondents who are married; indicating they were likely to be more successful in following the smoking cessation intervention than those who are single.[14]

Regulation of smoke-free areas is essentially to prevent or reduce the negative impact of smoking activities among passive smokers. Working areas and learning centre areas are two of seven of smoke-free areas in Indonesia regulation. In the university and colleges, the majority of these areas are closed, air conditioned rooms; the level of danger is two-fold higher in those rooms than outdoor areas. Therefore, employees who smoke in those rooms might expose hazardous elements of cigarettes to passive smokers. The preliminary findings of this study indicate air-conditioned rooms constituted 43.2% and 37% were left with a burning smell smoke. High support from the academic community is a positive value in upholding the smoke-free areas at university level,[15] as is the necessary monitoring and rigorous evaluation system by the college to create a smoke-free environment. The socialization form of intervention and counselling might also increase a person's readiness to quit smoking in the future.[16]

The implementation of harm reduction interventions was an initiated activity to support regulation of smoke-free areas, particularly in UNSRI. The approach can be conducted via two methods, namely community-based and institutional based. The implementation of an institutional approach is more easily accommodated than the community approach because it is organized. However, it does not mean that the results obtained tend to be better than in public institutions. It is seen that in this study, the success of the intervention at the university level is less effective than the application of the smoke-free area at the household level.[9] This is due to the nature of positive public acceptance who lack of health information; while media workers at higher education institutions tend to be more critical because of exposure to health information through various media.

Behavior change is a process that cannot be separated with the increase of knowledge, perceptions of smoke-free areas, and attitudes towards smoking behavior. Other research indicated that smoke-free area interventions might reduce at approximately 29% of cigarette consumption per employee at 20 workplaces in the United State. The results of the intervention in this study showed a significant change in the aspect of knowledge and attitudes towards smokers while the perception of smoke-free areas and smoking behaviour has not changed significantly. The integrated intervention has optimised the provision of a comprehensive intervention including giving candy cigarette substitutes, integrated counselling about smoking, and the provision of health promotion SMS.[17] Case management should be improved to avoid dropout intervention programmes such as providing counselling via telephone if the respondent could not attend the face-to-face counselling18. There are at least three policies that affect reduction smoking behavior, among others, a ban on smoking in the home, a ban on smoking in the workplace and government regulation.

In this study, increased knowledge (cognitive) of the respondents were indicated from awareness of smoke-free behavior in the workplace. This behavior indicated that the smokers understood that smoking behavior is not good both for themselves and their colleagues' health. Furthermore, the impact on passive smokers' health is greater than current smokers. The awareness of the rights of smokers are restricted by the rights of non-smokers to be free from tobacco smoke.[19] Perception or belief in accordance with the concept of Health Belief Model is a factor predictor of individual behavior and the impact of such behavior.[20] Statistical analysis in this study showed a negative correlation between perceptions of smoke-free area and smoking behavior of respondents. This is due to the difficulty of changing the mind-set of respondents to not smoke in air-conditioned rooms because they encounter difficulties leaving the room when they want to smoke. Active smokers tend to reduce smoking activities or even stop to smoke after they suffer from the disease.[21] Therefore people need strong will power in. initiating the reduction of cigarette consumption.

People's attitude towards smoke-free area are also contributed by smoking behaviour. The smoking ban in the work room or near the

workplace has become an effective regulatory mechanism in keeping the environment clean. This is in line with the attitude of the respondents in this study that the culture of smoking in the workplace is not good and creates a bad image for the workplace.[22] Therefore, adherence to the rule of non- smoking area in the workplace is a part of workers' role to their institution. Hence, if there is legislation prohibiting smoking in the workplace, especially air-conditioned rooms, respondents said they were willing to obey. In other words, smokers can still smoke outside their working place or room

## CONCLUSION

In general, this integrated intervention showed significant changes in knowledge and attitudes toward smoke-free areas in an air conditioned room but there was no difference in the average scores of perception and behavior before and after the intervention. Statistically the results showed that there is a weak correlation between the positive and patterned behaviors before and after intervention. Therefore, there should be a firm policy to restrict smoking for UNSRI employees' smoking behavior, socialization of smoke-free areas in the teaching and learning environment, especially in air-conditioned rooms, and an increase in peer group empowerment to achieve air-conditioned rooms without smoking.

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