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## **The effect of self-management intervention on behavioral intention among women passive smokers**

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**Abstract**--The number of smokers globally continues to increase every year. The World Health Organization (WHO) estimates that the death rate from smoking has reached 30%, or the equivalent of 17.3 million people, and the figure is predicted to continue to increase until 2030, reaching 23.3 million people. Of this figure, it is estimated that there are at least 8 million deaths caused by cigarette smoke and 1.2 million cases of which are passive smokers. Passive smokers are non-smokers who are exposed to second-hand smoke from active smokers. They suffer from more harmful effects than active smokers. Active smokers inhale cigarettes directly but through a filter in the cigarette, while passive smokers inhale unfiltered smoke plus smoke that has been exhaled out of active smokers' lungs. Strategic steps are needed to increase knowledge about the dangers of cigarette smoke for passive smokers such as a self-management intervention to raise awareness, increase knowledge, and change attitudes so that in the end a positive behavioral intention is formed to reduce the health risk of cigarette smoke. This is a quasi-experimental study with one group design with pretest and posttest, involving 100 respondents who were selected through purposive sampling. This design was used to compare the results before and after the self-management intervention in passive-smoking women. Paired t-test results show an increase in knowledge after the self-management intervention, with a difference in the mean value of 2.9 with  $p = 0.000$  ( $p < 0.05$ ); an increase in positive attitudes after self-management intervention with a mean difference of

3.32 with  $p = 0.000$  ( $p < 0.05$ ); and an increase in behavioral intention after self-management intervention, with a mean difference of 5.13 with  $p = 0.000$  ( $p < 0.05$ ). The independent t-test results show  $p = 0.000$  ( $p < 0.05$ ), which means that there are differences in knowledge, attitudes, and behavioral intention of female passive smokers after self-management intervention. The women who smoke passively are advised to improve self-management wherever they are to protect themselves from exposure to secondhand smoke. The intervention is an effort to prevent, maintain, and improve their health status in particular and public health in general.

**Keywords**--self-management intervention, behavioral intention, passive smoking women, knowledge, attitude.

## **Background**

The number of smokers in the world continues to increase from year to year and according to WHO, currently the number reaches 1.2 billion people. Cigarette smoke from active smokers is inhaled not only by themselves but also by those around them, a condition commonly referred to as passive smoking. Exposure to cigarette smoke in healthy individuals can lead to illness, disability, and even death. The adverse effects of tobacco smoke may cause asthma and exacerbate acute respiratory infections.<sup>1</sup> Self-management is an individual's ability to carry out self-care activities to maintain life and improve and maintain health and well-being. Self-management is an individual activity to control symptoms and take care of both physical and psychological conditions and adjust their lifestyle to the disease they are suffering from to maintain life, health, and well-being. The purpose of self-management as a systematic intervention in chronic disease is to control oneself and improve one's ability to make decisions in planning the appropriate treatment. Intervention is the key to optimizing health, controlling and managing signs and symptoms that arise, preventing complications, and minimizing disturbances caused to bodily functions, emotions, and interpersonal relationships with other people that can interfere with the one's life.<sup>2</sup>

Self-management in women who smoke passively includes the following Communicating well and politely with active smokers when they are smoking in no-smoking places by suggesting them to move to a smoking room (whenever available), Avoiding gathering with active smokers or being in the same room with them and instead finding an open place with fresh air, free from cigarette smoke, Establishing a 'no smoking' policy for family members and guests in the house, for example by not providing ashtrays, Always choosing a no-smoking room whenever available in public places such as restaurants, cafes, or offices, Always wearing a mask when leaving the house to reduce exposure to cigarette smoke, Strengthening the body immune system by consuming healthy foods such as fruits and vegetables and avoiding fast food and fried foods, Regularly doing sports or physical activities such as walking, jogging, cycling, or swimming.

This intervention aims to increase knowledge, understanding, and ability as an action to protect, preserve, and maintain health and prevent the dangers of

exposure to secondhand smoke for women passive smokers. Behavioral intention is based on awareness, intention, and willingness, which then forms the passive smokers' ability to avoid exposure to cigarette smoke as an effort to prevent and protect themselves from the dangers of such exposure. Behavioral intention is a function of two basic determinants: individual attitudes towards behavior and individual perceptions of social pressures to perform or not to perform subjective norms.<sup>8</sup> Research by Eun-Hye Lee, Sun-Hwa Shin and Goo-Churi Jeong (2022), entitled *Smoking Awareness and Intention to Quit Smoking in Smoking Female Workers: Secondary Data Analysis*, reveals that women who are able to quit smoking generally have higher awareness and intention to quit smoking along with experience and supported by a smoking cessation policy. Furthermore, a study by Dahyeon Lee, King-Sook Lee, Ahnna Lee, Hyeju Ahn, Hyun-kyung lee, Hyekeyeong Kim, Jakyoungh Lee and Hong-Gwan Seo (2021), entitled *Successful Smoking Cessation Among Women Smokers Based on Utilizing National Smoking Cessation Service Type in Korea*, reveals that special programs or interventions applied to working women to help them quit smoking showed a significant increase in participation. These women were enthusiastic, emotional, and motivated in this intervention program. This program ran for 5 days [OR=7.79, CI=[6.49,9.35] and participants had to stay overnight during the program [OR=2.36, CI=[1,89,2.94]. This study aims to measure the effect of self-management on the behavioral intention among passive-smoking women.

## **Method**

This study is a quasi-experimental study with one group design with pretest and posttest, to assess the knowledge, attitudes, and behavioral intention of passive-smoking women before and after the self-management intervention. The intervention is expected to increase knowledge, improve attitudes, and stimulate the formation of concrete behavior, subjective norms, and strong self-control in women passive smokers. This study was conducted for 24 weeks from January to August 2022 and involved 100 respondents who were selected through purposive sampling with only one inclusion criterion: women who smoke passively. The data were then analyzed using a paired t-test to see the effect of self-management on their behavioral intention.

Study design: O1 XA O2

Where:

O1: Pretest before the intervention to determine the initial knowledge, attitudes and behavioral intention

O2: Posttest immediately after the intervention to determine the resulting knowledge, attitudes and behavioral intention

XA: Self-management intervention on behavioral intention

## **Results**

### **Respondents' characteristics**

Respondents were women with family members as passive smokers (husband or brother) and grouped by age, type of employment, and education. The frequency

distribution of the respondents' characteristics can be seen in Table 1.1 below.

Table 1.1  
Respondents' Characteristics based on age, type of employment, and education, 2022 (n=100)

No	Respondents' Characteristics	Frequency	Percentage (%)
1	Age		
	a. 15-30 years	27	27
	b. 31-50 years	73	73
2.	Type of Employment		
	a. Private Sector	9	9
	b. Government	67	67
	c. Students	7	7
	d. Housewives	17	17

### Education

a. Bachelor	8	8
b. High School	72	72
c. Middle School	20	20

Total	100	100
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Source: Primary data, 2022

Table 1.1 shows that the majority of respondents aged 31-50 years with 73 people (73%) and the rest aged 15-30. Based on the type of employment, 7 respondents were students, 9 respondents worked in private sectors, 17 respondents were housewives, and most respondents (67) worked for the government. Based on education, the majority of respondents were High School graduates with 72 people (72 %), followed by Middle School with 20 people and Bachelor's degree with 8 people. According to the results of a study by Minh Nguyen, Nobuo Nishi, *et al* (2018), entitled *Passive Smoking at home by Socioeconomic Factors in Japanese Population: NIPPON DATA 2010*, it was revealed that working women have a higher risk of becoming passive smokers. Therefore, intervention is needed to increase knowledge, attitudes and positive behavioral intention of passive-smoking women.

### Effect of Self-management on Knowledge

The effect of self-management on knowledge in women who smoke passively was tested using paired t-test, because the data distribution was normal. The mean value of the pretest and posttest on the knowledge variable can be seen in Table 1 below.

Table 1  
Comparison of Pretest and Posttest Mean Values on Knowledge

Variable	Mean		Difference (mean)	Statistics	
	<i>Pretest</i>			t	p
Knowledge	<i>Pretest</i>	2.20	2.9	6.55	0.000
	<i>posttest</i>	5.10			

Table 1 above shows a significant mean difference with  $p = 0.000$  ( $p < 0.05$ ), which means that there is a difference between before and after the self-management intervention on respondents' knowledge. The difference in the mean value of 2.9 means that there is an increase in knowledge of 2.9 times after the self-management intervention.

### Effect of Self-Management on Attitude

The effect of self-management on attitude in women who smoke passively was tested using paired t-test, because the data distribution was normal. The mean value of the pretest and posttest on the attitude variable can be seen in Table 2 below.

Table 2  
Comparison of Pretest and Posttest Mean Values on Attitude

Variable	Mean		Difference (mean)	Statistics	
	<i>Pretest</i>			t	p
Attitude	<i>Pretest</i>	1.98	3.32	7.46	0.000
	<i>posttest</i>	5.30			

Table 2 above shows a significant mean difference with  $p = 0.000$  ( $p < 0.05$ ), which means that there is a difference between before and after the self-management intervention on respondents' attitude. The difference in the mean value of 3.32 means that there is an increase in attitude of 3.32 times after the self-management intervention.

### Effect of Self-Management on Behavioral Intention

The effect of self-management on behavioral intention in women who smoke passively was tested using paired t-test, because the data distribution was normal. The mean value of the pretest and posttest on the behavioral intention variable can be seen in Table 2 below.

Table 3  
Comparison of Pretest and Posttest Mean Values on Behavioral Intention

Variable	Mean		Difference (mean)	Statistics	
	Pretest	Posttest		t	p
Behavioral Intention	9.37	14.50	5.13	10.54	0.000

Table 3 above shows a significant mean difference with  $p = 0.000$  ( $p < 0.05$ ), which means that there is a difference between before and after the self-management intervention on respondents' behavioral intention. The difference in the mean value of 3.32 means that there is an increase in behavioral intention of 3.32 times after the self-management intervention.

### Discussion

This chapter presents the interpretation of the research results and their implications by discussing the differences and similarities between the results of this study and the results of related studies accompanied by a review of the relevant literature. Limitations of the study discuss the limitations of the research sampling while the implementation of the study discusses the effects or benefits of research results on services and the development of public health science.

### Effect of Self-management on Knowledge

The results of the research show a difference in the mean value of 2.9 between the pretest and posttest, which indicates an increase of 2.9 times in knowledge in the intervention group, with  $p = 0.00$  ( $p < 0.05$ ). Knowledge is the result of human sensing, or the result of knowing about objects through senses (eyes, nose, ears, and other senses).<sup>3</sup> The knowledge of passive smoking women about the dangers of exposure to cigarette smoke are various things that they know through the five senses. In this case, their knowledge increases after the self-management intervention through their five senses after observing, seeing, and following the intervention.

Based on the results of Manisha Mistry's research, entitled *Knowledge and attitude on Hazards of passive smoking among Women of Pune City* (2020), there is a relationship between knowledge and attitude scores, as it is revealed that 24% of women had poor knowledge, 16% of women had good knowledge, and 10% Women had standard knowledge about the dangers of passive smoking. Research by Su-Er-Guo, Mei-Yen Chen, Chizimuzo Okoli, and Yi-Fan Chiang (2022), entitled *Effectiveness of Smoking Prevention Programs on the Knowledge, Attitude, and Anti-Smoking Exposure Self-Efficacy Among Non-Smoking Rural Seventh-Grade Students in Taiwan*, reports an increase in knowledge about smoking in the intervention group shown by [B=4.38,  $p < 0.001$ ] and SHS [B = 2.35,  $p < 0.001$ ]. This means that the respondents' knowledge increased significantly after the intervention. The passive smoking group also showed a significant increase in avoiding exposure to secondhand smoke [SHS] [B=3.03,  $p=0.031$ ]. However, a study by Herlina Mayangsari and Mohammad Afzal Mahmood (2021), entitled *Active Smoking and Exposure to Passive Smoking among Pregnant Women*

*Attending Primary Health Centers in Temanggung, Indonesia*, revealed that although women have good knowledge about the adverse effects of cigarette smoke exposure, a large proportion of pregnant women [91.3%] continue to be exposed to secondhand smoke. However, none of the pregnant women respondents smoked at the time of the study. The high prevalence of passive smoking is a challenge and requires firm efforts to reduce it.

Good and comprehensive knowledge about the dangers of exposure to cigarette smoke and supportive environmental conditions are expected to help women who smoke passively to protect themselves as an effort to prevent and control health problems caused by such dangerous exposure. Research by Xiao An, Junliang Wang, Weiqing Shi, Rui Ma, Zhirui Li, Ming xing Lei, Yaosheng Liu, and Feng Lin (2021), entitled *The Effect of Passive Smoking on Early Clinical Outcomes After Total Knee Arthroplasty Among Female Patients*, reveals that passive smoking negatively impacts female patients after total knee arthroplasty. This condition has triggered bad pain and further exacerbates depression and anxiety and reduces their quality of life. Avoiding exposure to secondhand smoke can help female patients with arthroplasty both before and after surgery.

Research by Shino Oba, Atsushi Goto, Tetsuya Mizoue, Manami Inoue, Norie Sawada, Mitsuhiro Noda, and Shoichiro Tsugane (2020), entitled *Passive smoking and type 2 diabetes among never-smoking women; The Japan Public Health Center-Based Prospective Study*, finds that women with husbands who smoke 40 cigarettes/day have a higher risk of diabetes than women with husbands who do not smoke [odds ratio 1.34, 95% and confidence interval 0.96-1.87]. Research by Yann Nguyen, Carine Salliot, et al (2021), entitled *Passive smoking in childhood and adulthood and risk of rheumatoid arthritis in women: results from the French E3N cohort study*, reveals that women exposed to secondhand smoke in childhood and adulthood were at risk of developing rheumatoid arthritis at a mean age of 47.8 years with an analysis [HR [95%CI] 1.24 [1.01 to 1.51] and 1.19 [1.02 to 1.40] with exposure to passive smoking in childhood and/or adulthood [47.6/100000 person-years], which is identical to the risk in people who have been passive smokers. Furthermore, research by Huiting Chen, Jigen Na, Hang An Ming Jin, Xiaoqian jia, Lailai Yan, Nan Li and Zhiwen Li (2022), entitled *Passive Smoking is Associated with Multiple Heavy Metal Concentrations among Houses in Shanxi Province, China*, finds that exposure to cigarette smoke [tobacco] in the surrounding environment contributes to the accumulation of As, Ge, Ti, and Fe in exposed housewives. This is indicated by the discovery of the heavy metal content in their hair samples.

Increasing the knowledge of women who smoke passively can improve preventive ways or measures through the following ways: politely reminding people when they see people smoking in no-smoking places; avoiding gathering with active smokers and looking for a place with fresh air and free from cigarette smoke; prohibiting people from smoking in the house so that family members who do not smoke are free from exposure to cigarette smoke; choosing a no-smoking room whenever available in a public places such as shops, cafes, or offices; wearing a mask when going out of the house to reduce exposure to secondhand smoke; and always consuming healthy foods and foods that contain anti-oxidants such as fruits and vegetables.

### **Effect of Self-management on Attitude**

The results of the research show a mean difference of 3.32 between the pretest and posttest, which indicates an increase of 3.32 times in attitude in the intervention group, with  $p = 0.00$  ( $p < 0.05$ ). Research by Manisha Mistry (2020) also states that knowledge scores and attitude scores are interrelated [ $p < 0.05$ ], which means that increasing positive knowledge will also improve positive attitudes. On the other hand, research by Su-Er-Guo, Mei-Yen Chen, Chizimuzo Okoli, and Yi-Fan Chiang (2022) reveals that intervention modification is needed to increase the effect of programs or interventions to form positive attitudes about the dangers of cigarette smoke exposure in passive smokers. Attitudes toward a behavior are influenced by the belief that the behavior will lead to the desired or undesired results. Beliefs about what behavior is expected by others (normative) and motivates to act in accordance with these expectations form subjective norms in individuals. Behavioral control is determined by past experience and individual's estimation of how difficult or easy the behavior is to perform. Behavioral control is crucial when a person is in a low self-esteem state.<sup>3</sup>

In general, respondents can be fostered, stimulated, and directed by using appropriate methods or strategies in shaping the expected behavior. The thought processes of the respondents also need to be monitored whether they show positive signs, such as the emergence of strong self-confidence in interpreting something with reality (delusions). This condition requires an external stimulus, such as appropriate and effective therapy to restore their thought processes. Therefore, the use of appropriate therapeutic methods can help convey information to respondents effectively so that it can be received and absorbed well and then form a good attitude along with increasing respondents' knowledge about the dangers of exposure to secondhand smoke.

### **Effect of Self-management on Behavioral Intention**

The results of the research show a difference in the mean value of 5.13 between the pretest and posttest, which indicates an increase of 5.13 times in behavioral intention in the intervention group, with  $p = 0.00$  ( $p < 0.05$ ). The value of behavioral intention increases along with the increase in respondents' knowledge and attitude. Behavioral intentions, psychologically, are internally attached and influenced by the needs, beliefs, subjective norms, and self-control of each individual.<sup>3</sup> This is a function of two basic determinants: individual's attitude towards behavior and individual's perception of social pressure to perform or not to perform subjective norms.<sup>8</sup> Based on the theory of planned behavior, beliefs affect attitudes towards certain behaviors, subjective norms, and internalized behavioral control. These three components interact and become determinants of intentions which in turn will determine whether the behavior is eventually carried out or not.<sup>3</sup>

After the intervention, the majority of respondents (83%) tried to choose a smoke-free room when they were in public places such as restaurants, cafes, or offices. Meanwhile, 79% refused to provide a cigarette ashtray in their living room and 78% of respondents avoided gathering with active smokers and trying to find a place with fresh air and free from cigarette smoke. Self-management can help

self-control and make decisions in planning one's own health protection so as not to become passive smokers by controlling their environment through prevention and avoidance of cigarette smoke exposure.<sup>2</sup> Research by Yaoyao Li, Shanshan Zhang, Jie Song, Miao Tua, Chengmei Sun, and Fuguo Yang (2021), entitled *Effects of Self-Management Intervention Program Based on the Health Belief Model and Planned behavior theory on Cell-Management Behavior and Quality of life in Middle-Aged Stroke Patients*, reveals that the total score for self-management, the total score for quality of life, and the score for each dimension increased significantly after the intervention [ $p < 0.05$ ]. This indicates that the Theory of Planned Behavior helps to improve self-management skills and quality of life in stroke patients.

Further, research by Andrea Marques, Eduardo Santos, Elena Nikiphorou, Ailsa Bosworth, and Loreto Carmona (2021), entitled *Effectiveness of self-management interventions in inflammatory arthritis: a systematic review informing the 2021 EULAR recommendations for the implementation of self-management strategies in patients with inflammatory arthritis*, reveals that self-management had a positive impact in the treatment of arthritis. Research by Cameron P. Hust, Nitchamon Rakkapao, and Karen Hay (2021), entitled *Impact of diabetes self-management, diabetes management cell-efficacy and diabetes knowledge on glycemic control in people with diabetes[T2D]: A multi-center study in Thailand*, reveals that diabetes self-management, self-efficacy management, and knowledge were associated with the ability to control glycemic level in Thai people with T2D.

Furthermore, a study by Madison Milne-Ives, BAS, MSc, et al, entitled *Self-management interventions for people with Parkinson's Disease: Scoping Review*, reveals that self-management interventions were beneficial for improving care and recovery in patients with Parkinson's disease. Research by Murad H. Taani, Scott J. Strath, Rachel Schiffman, Michael Fendrich, Amy Harley, Chi C. Cho, Yosuke Yamada, and Christine R. Kovach (2022), entitled *Self-management processes, sedentary behavior, physical activity and dietary self-management behaviors: impact on muscle outcomes in continuing care retirement community residents*, finds that good self-management could increase physical activity, reduce sedentary behavior, help comply with dietary regulation, and have a positive impact on muscle strength in community care for the retired or elderly people.

Self-management can be done by various methods. Research by Emma Kinley, Imogen Skene, Elizabeth Steed, Hilary Pinnock, and Kirstie McClatchey (2022), entitled *Delivery of supported self-management in remote asthma reviews: A systematic neat realist review*, reveals that remote or distance learning methods were more effective than in-person consultations, because the method was more comfortable, more accessible, had a higher attendance rate, and could deliver the messages well, so that asthma patients' care can be given sustainably. Research by Katelyn R. Smalley, Lisa Aufegger, Kelsey Flott, Erik K. Mayer, and Ara Darzi (2022), entitled *The Self-Management Abilities Test [SMAT]: A Tool to Identify the Self-Management Abilities of Adults with Bronchiectasis*, states that the SMAT could be used to identify self-management abilities of adults with bronchiectasis.

To increase individual's understanding of ways to reduce exposure to secondhand smoke, methods other than self-management can be applied, such as

motivational interviews. A study by Roghieh Bayrami, Samira Ebrahimi, Javad Rasouli, and Haydeh Fezipour (2022), entitled *The Effect of Couple Motivational Interviewing on Exposure to Secondhand Smoke Among Pregnant Women at Home*, shows that there was a significant reduction in the daily frequency and duration of exposure to cigarette smoke [SHS] in pregnant women after the interview.

### **Limitations**

The measurement of posttest results was carried out immediately after the self-management intervention so that the results may have not been fully complete because the measurement of behavioral intention requires adequate time and conducive condition. In addition, other factors, both internal and external, also act as confounders so that they may have an impact on the results of the study.

### **Conclusion**

- The difference in the mean value between pretest and posttest on the knowledge variable was 2.9 with  $p = 0.000$  ( $p < 0.05$ ), indicating that there is an effect of self-management on the knowledge of passive-smoking women.
- The difference in the mean value between pretest and posttest on the knowledge variable was 3.32 with  $p = 0.000$  ( $p < 0.05$ ), indicating that there is an effect of self-management on the attitude of passive-smoking women..
- The difference in the mean value between pretest and posttest on the knowledge variable was 5.13 with  $p = 0.000$  ( $p < 0.05$ ), indicating that there is an effect of self-management on the behavioral intention of passive-smoking women between before and after the self-management intervention.

### **Recommendation**

- For passive-smoking women  
They need to improve self-management wherever they are in order to protect themselves from exposure to cigarette smoke as an effort to prevent, maintain, and improve their health in particular and the public health in general.
- For stakeholders and policy makers  
They need to add and expand no-smoking areas in public areas, to reduce the amount of exposure to secondhand smoke to raise awareness among active smokers.

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