

## Effectiveness of Self-Modification Program in Smoking Reduction

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**Abstract:** It is a descriptive and experimental research with the objectives of describing factors causing smokers to have smoking behaviors; describing the intensity of smoking behaviors among smokers and testing the effectiveness of the self-modification program in smoking reduction. The population was 94 smokers in Pupuan village, Tegallalang sub-district, Gianyar Regency, Bali Province, Indonesia. A simple random sampling was employed to test the effectiveness of the self-modification program in smoking reduction. An experimental design employed was the randomized pretest control group design where the subjects were randomly assigned into the experimental and the control groups. The data were collected through interviews and questionnaires method. The collected data were analyzed using a descriptive analysis technique and t-test. The results showed that smoking behavior was formed due to some desires to try as a result from the influences from the peer, parents and other smoking people. The behavior was persisting and growing since it was tolerated from the surrounding people such as wives and children; the intensity of smoking behavior among this research subject in general may be included into moderate smokers where it consisted of 23.4% light, 63.8% moderate and 12.8% heavy smokers; the self-modification program was effective in reducing smoking behavior but it merely stopped the smoking behavior of 30% of the whole members of the experimental group, since some members of the experimental group did not do the self-modification program seriously.

**Key words:** Smoking behavior, self-modification program, experimental group, surrounding, population, randomized, Indonesia

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### INTRODUCTION

Smoking is one of the behavior commonly found among the people either among the children, adolescents or adults. The consumption of cigarettes in Indonesia occupies the fourth rank in the world after China, USA and Russia and the second rank in Asia, certainly after China. Smoking causes the risk factor of the four prominent Non-Communicable Diseases (NCD) in the world. The four NCDs are heart, diabetes mellitus, cancer and chronic lung diseases. Unhealthy eating patterns, less physical activities and alcoholic drink are merely the risk factors of the three NCDs. This shows that smoking is a big problem for the people's health (Eriksen *et al.*, 2012). Smoking action may cause deadly diseases such as happen to about 6,000,000 persons per year. More than 5,000,000 deaths occurred to active smokers and 600,000 deaths to passive ones (WHO, 2013). Smoking is the highest risk factor of death in China (Gu *et al.*, 2009). In Indonesia, 20% deaths of men and 12% of women are caused by diseases related to smoking (Eriksen *et al.*, 2012).

Smoking is very dangerous for health. In one cigarette, 4000 chemical compounds such as carbon monoxide, nicotine and tar are contained. Moreover, it may also cause low work productivity, especially when

smoking is done while working. Viewed from any sides no profit may be gained from such smoking behavior but there are still many people who do smoking and who cannot stop smoking. Various efforts have been made to reduce the number of smokers and the frequency of smoking. The efforts among others are the determination of smoking areas in certain places; counseling about the danger of smoking; appeals that smoking may cause dangerous diseases such as heart, diabetes mellitus, cancer, disorders of pregnancy and chronic lung diseases. Even, an appeal is made that smoking kills you, meaning that smoking may result in death. No report or reference may prove that such efforts have succeeded in reducing smoking behavior among the people.

It is necessary to think and to find out other effective efforts in the smoking reduction among the people. The efforts must be based on the concept of how the behavior is formed and how the formed behavior may be omitted. According to the behavioristic theory such smoking behavior is caused by the results of learning and therefore it should be excluded through certain techniques. According to the behavioristic theory, there are some techniques or counseling that may be used to form behavior to omit newly formed behavior or substitute old unintended behavior with new, expected new

one. The techniques are among others applied behavioral analysis: operant conditioning techniques, relaxation training and related methods, disensitisasi sistematis in vivo exposure and flooding implosive therapy, eye movement desensitization and reprocessing, social skills training, self-modification programs and self-directed behavior, multimodal therapy: clinical behavior therapy, mindfulness and acceptance-based cognitive behavior therapy (Corey, 2009). Meanwhile, according to Corey (1982), behavioral counseling and psychotherapy techniques include relaxation training and related method, systematic desensitization, implosive therapy, aversive technique, modeling technique and economic Token. The techniques under the category of the cognitive behavior are among others cognitive restructuring, thought stopping, assertive exercises, social skill training, self-management program and self-directed behavior. Each technique is merely suitable for forming and omitting certain behavior but not others.

Special for smoking behavior based on the results of preliminary interviews with smokers, actually no one likes to smoke. They want to stop smoking but they cannot. When a situation allows them to smoke for examples, during the coffee time in the morning in the free time after eating or in a relaxed situation during chatting, they cannot explicitly refuse smoking. However, when in the case that some people stop smoking totally because it is their deadly diseases that threaten their lives. The threats cause a strong commitment to stop smoking. But such a commitment to stop smoking may be considered to be late. One should realize the impacts of smoking on one's health from observing others who have suffered from some diseases due to smoking. Then, it is a strong reason to plant and to do systematic and serious efforts to stop smoking.

Based on the descriptions above an effort that seems to be suitable for reducing and even stopping smoking behavior is self-modification program, since in this program, smokers are asked to make some efforts to change from determining the objective, translating the objective into the target behavior, making self-monitoring, working in line to the plan of change to evaluating the plan of change (Corey, 2009).

Theoretically, the self-modification program seems to be effective in reducing smoking behavior but empirically it has not been understood yet. To know empirically, the effectiveness of the self-modification program in reducing smoking behavior, this present research was made with the following objectives: describing factors causing smokers to have smoking behaviors; describing the intensity of smoking behaviors among smokers and testing the effectiveness

of the self-modification program in smoking reduction. Smoking is an activity of inhaling or enjoying smoke. Smoking behavior, especially for adolescents is often used as a compensation for their unpopularity in their classroom or at school. Smoking behavior for adolescents is symbolization behavior a symbol for their maturity, strength, leadership and sex appeal for their opposite sex. Smoking behavior directly and consistently is influenced by the parent's smoking habit. Moreover in general each person has his/her own curiosity. Due to high curiosity, one tends to like to adventure, explore and try anything one has not experienced yet. Smoking behavior generally is caused by such curiosity to explore and to try. Since such exploration and tryout may result in some satisfaction, one tends to repeat it until it becomes a need or a habit that is difficult to change (Maseda *et al.*, 2013). Smoking is not only physically and mentally dangerous for the smokers themselves but also for their families. In a research, it is found that there is a relationship between smoking mothers and their children, namely the children tended to be rebellious and aggressive. The smoker's children would tend to be easily suspicious and cynical to others. Moreover, smoking may cause a child not to be able to understand any explanations from the teacher well (Rafikasari, 2015).

There are four stages of smoking behavior so that, one becomes a smoker. Preparatory stage: one gets a pleasing description about smoking by hearing, seeing or reading. These generate some interest in smoking. Initiation stage: it is a stage where one would continue or stop smoking behavior. Becoming a smoker stage: when one has consumed 4 pieces of cigarettes a day, one tends to become a smoker. And maintenance of smoking stage: at this stage, smoking has become one part of self-regulating. Smoking is done to gain pleasing psychological effects.

Komasari and Helmi (2000) suggest some factors that cause smoking behavior namely the parent's permissive behavior to their children's smoking behavior, influences from the peer group and pleasing psychological effects that are three significant predictors of smoking behavior. Self-modification program which Corey (2009) calls self-management is a program of changes in behavior which is designed, conducted, monitored and evaluated by the client him/herself and his/her counselor as facilitator. The objective of this program is to encourage clients to be more autonomous in managing their lives and not to be dependent upon experts in solving their own problems. In this program, counselors share perspectives with clients, especially anything dealing with teaching clients skills needed to

manage their own lives effectively. The advantage of this program is that counseling or therapy may be developed into the ways that cannot be traditionally made. Another advantage is that the cost may be minimalized, since the client does by himself of what has been plan to do. Moreover, this program also tends to improve the client's involvement and commitment because this program is done for changing one's self. The self-modification strategy includes self-monitoring, self-reward, self-contracting, stimulus control and self-as-model. The basic idea of this self-modification program is that any changes may be made by teaching one to use the coping skill in a problematic situation. The generalization and the attainment of results may be improved by encouraging the client to get responsibility for implementing this strategy in his/her daily life.

To succeed in this program, a careful analysis of the behavioral context is very important and one should be willing to take basic steps as suggested by Watson and Tharp (Corey, 2009) as follows selecting and determining the objectives. The objectives should be determined one by one and should be measurable, attainable, positive and significant for him/her. It is important to in order to make the objectives realistic) translating the objectives into the target behavior. It is necessary to identify any behaviors that is targeted to be changed. After the targets are selected, some anticipation to face any hindrances and to think the ways to negotiate them is made self-monitoring. It is necessary to intentionally and systematically observe, note and record one's behavior and to comment on the relevance of the antecedent and the consequences of the behavior itself. Working on implementing the plan to change. Some action programs should be made to realize the real changes. Various plans for the same objective may be made where each plan should be tried to be effective. Some types of self-reinforcement systems are needed since reinforcement is the most important thing in a modern behavioral therapy. Self-reinforcement is a temporary strategy used until a new behavior has been implemented in daily life. It is necessary to make some steps to ensure that the advantages obtained would be maintained. Evaluating the action plan. Some evaluation of the plan for changes to determine whether the objective has been achieved and to adjust or revise the plan as a way to meet the objective to attain should be made. Evaluation is a continuous process, instead of one process. and self-change is a long-life practice.

Some previous research results, for example Permata Sari (2014)'s showed that the application of the self-management technique may help solve low learning disciplines among counselees. Marwi and Sutijono (2012)

found that the use of the self-management technique may reduce some levels of learning laziness among students of VIII E of Mts Al-Rosyid Daqnder, Bojonegoro. Isnaini (2014) suggested that group counseling with self-management technique is effective in improving learning disciplines. Sari (2014) based on the analysis of 13 Articles of the research results found concludes that the self-management program with various intervention component applied to adults suffering from cancers is effective in reducing the intensity of their pain and in improving their life quality.

## **MATERIALS AND METHODS**

It is a descriptive and experimental research. The descriptive nature in this design is intended to know the causes and the intensity of smoking behavior while the experimental design is aimed at testing the effectiveness of the self-modification program in smoking reduction. A randomized pretest-posttest control group design was employed in the experimental design.

The population of this research was 94 smokers living in Pupuan village, Tegallalang sub-district, Gianyar Regency, Bali Province, Indonesia. The term "smoker" here refers to any individual who routinely consumes at least 4 pieces of cigarettes a day (Komasari and Helmi, 2000). To obtain the population some interviews were made with the heads of hamlets in each hamlet in Pupuan village, Tegallalang sub-district. Pupuan village consists of 5 hamlets, namely Peraan, Pupuan, Tegal Payang, Timbul and Calo. The interviews with the heads of hamlets were made by 5 field workers to get data on smokers in each hamlet. After that, further interviews were made with smokers in each hamlet. The interviews were intended to collect more complete and more detailed data on smokers and the number of cigarettes they consumed a day in each hamlet in Pupuan village, Tegallalang sub-district, Gianyar Regency, Bali Province. From 94 smokers in Pupuan village, then 20 smokers were randomly taken as the research sample where 10 smokers served as the experimental group, the other 10 smokers as the control group.

This research involved a independent variables namely the self-modification program and the dependent variable, smoking behavior, self-modification program is a program of changing behavior covering self-monitoring, self-reward, self-contracting, stimulus control and self-as-model with the following stages: choosing and determining the objectives, translating the objectives into target behavior, self-monitoring, implementing the plan for changes and evaluating the group was made by the steps presented in

**Table 1: Steps and activities of treatment**

Steps	Activity
Choosing and determining the objectives	Together with subject, determined the objectives to attain, stop smoking
Translating the objectives into target behavior	Stopped buying cigaretes did not want to receive any cigarettes from others, during the coffee time in the morning, or a relaxed time after eeting, other activities would be done without smoking
Self-monotoring	Together with subject, made a form for monitoring behavior the subject showed each day relating to smoking behavior. The form was filled in by the smoker and periodically reported to the researcher
Implementing the plan for changes	The subject individually implemented the determined plan, nmely each day he did not by cigarettes did not receive any offer of cigarette from others and did not smoke during the times where he used to smoke
Evaluating the action plan	Each week, the subject with the researcher reviewed the formof self-monitoring and discussed any hindrances he experienced and revised the plan of activity for the next week

Table 1. The data collected in this research were on the smokers, the causes of smoking behavior, the intensity of smoking behavior (the number of cigarettes routinely consumed each day by the smokers), the smoking behavior of the members of the experimental and the control groups before and after the treatment. Data on the smokers were collected through interviews made by 4 University students that had been trained before. The source of the first data on the smokers was the heads of 5 hamlets in Pupuan village. Since, the head's knowledge of the smokers in their hamlets might not complete, the source of the data on the smokers was extended into smokers mentioned by the heads of hamlets. Other data namely those on the causes of smoking behavior, the intensity of smoking behavior and on the smoking behavior of the members of the experimental and the control groups before and after the treatment were collected through interviews method.

Instruments needed to collect the data consist of an interview guide to collect data on the smokers, questionnaires to collect data on the causes of smoking behavior and data on the smoking behavior either for the whole members of the population or the experimental and the control group, before and after the treatment. To know the causes and the intensity of smoking behavior among the smokers, the data were descriptively analyzed, meanwhile to test the effectiveness of the self-modification program in reducing the smoking behavior, the data were analyzed using a statistical analysis technique, namely the t-test (Guilford and Fruchter, 1973). Before the t-test a test of the normality of the data distribution was made using the chi-square test.

**RESULTS AND DISCUSSION**

On the basis of the data obtained through questionnaires administrated to 94 members of the research population, the causes of smokers in their smoking actions as presented in Table 2 were identified. And then the causes of the smoking behavior were continued or maintained by the smokers, so that they made themselves smokers

(Table 3). The intensity of smoking behavior among the smokers in Pupuan village, Tegallang sub-district, Gianyar Regency may be seen from the number of cigarettes consumed by th smokers in a day. According to the data, the number of cigarettes consumed by the smokers were from 8-64 pieces of cigarettes per day. The results of the descriptive analysis of the data obtained showed that the number of cigarettes daily consumed by the smokers in Pupuan village, Tegallalang sub-district, Gianyar Regency were from 6-64 pieces with the mean of 16.8 cigarettes and the mode of 16. Meanwhile, the results of the analysis of frequency in the data were presented in Table 4.

On the basis of the criteria presented by HSE (2013) heavy smokers consume more than 21 pieces of cigarettes per day, moderate, 11-21 and light smokers, 11 pieces of cigarettes per day. Therefore, it can be concluded that from the mean number (16.8), the smoking behavior of the smokers in Pupuan village, Tegallalang sub-district, Gianyar Regency is included into moderate smokers. However, when it is examined in detail on the basis of the results of the analysis of the frequency in the obtained data, it can be stated that 23.4% smokers in Pupuan village, Tegallalang sub-district, Gianyar Regency are under the category of light smokers, 63.8%, moderate smokers and 12.77%, heavy smokers.

The effectiveness of the self-modification program in reducing smoking behavior. The results of the data analysis using the t-test to t the effectiveness of the self-modification program to reduce smoking behavior among the smokers in Pupuan village, Tegallalang sub-district, Gianyar Regency showed that there was no difference in behavior between the experimental group and the control group before the self-modification Program treatment was implemented ( $t = -0.350$ ;  $p = 0.730$ ). It means that the condition of the experimental group and the control group related to the smoking behavior before the treatment was the same. However, the smoking behavior between the experimental group and the control group after the treatment was significantly different ( $t = -3.161$ ;  $p = 0.005$ ), meaning that the smoking behavior of the experimental group after the treatment was significantly lower than that of the control group. On the

Table 2: Preliminary causes of smoking behavior among smokers in Pupuan village, Tegallalang sub-district, Gianyar Regency, Bali Province

Causative factors	No. of respondent	Percentage of respondent
Influence of smoking peer group	31	32.98
Trying it out by oneself while sitting in the food stalls	22	23.40
Trying it out by oneself because there are many people smoking cigarettes after having meals during the feast	28	29.79
Showing masculinity	6	6.38
Trying it out by oneself because when other people are smoking, they seem to enjoy it	3	3.19
Imitating the parents	4	4.26
Total	94	100.00

Table 3: Causes of smoking behavior maintained by smokers

Causative factors	Jumlah responden	Percentage of responden
No prohibition from parents	7	7.45
No prohibition from wives	31	32.98
No protest from children	6	6.38
Getting satisfaction	29	30.85
Helping concentration in work and other activities	15	15.96
Filling in leisure time	6	6.38
Total	94	100.00

Table 4: Results of the analysis of the smoking behavior of the smokers in Pupuan village, Tegallalang sub-district, Gianyar Regency

No. of cigarettes	No. of consumer	Percentage of consumer	Cumulative percentage of consumer
6	1	1.100	1.100
8	19	20.200	21.300
10	2	2.100	23.400
12	1	1.100	24.500
16	56	59.600	84.000
20	3	3.200	87.200
24	2	2.100	89.400
32	7	7.400	96.800
48	2	2.100	98.900
64	1	1.100	100.000
Total	94	100.000	-

basis of the results of the data analysis, it can be concluded that the treatment with self-modification program may effectively reduce the smoking behaviors of the smokers in Pupuan village, Tegallalang sub-district, Gianyar Regency. Dealing with the changes in the smoking behavior in the experimental group and the control group before and after the treatment (Fig. 1).

To test the sustainability of the smoking behavior that had significantly been reduced after the treatment was stopped in this present research data on the smoking behavior of the experimental group after the treatment was stopped for 2 weeks were collected. The result of the t-test showed that no difference existed in the smoking behavior of the experimental group after the treatment (post-test) and after the treatment was stopped for 2 weeks ( $t = -0.269$ ;  $p = 0.791$ ). The result of the t-test shows that although the treatment had been stopped for 2 weeks, the smoking behavior of the smokers in Pupuan Village, Tegallalang sub-district, Gianyar Regency had still lasted like the treatment made. Therefore, it can be concluded that the self-management program was not only effective in reducing the smoking behavior but also in maintaining

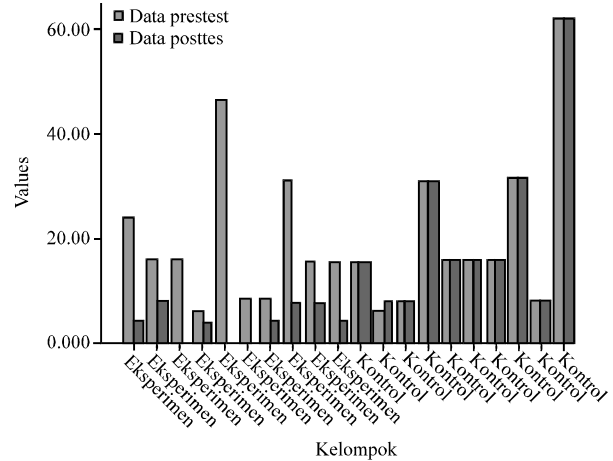


Fig. 1: Bar chart of the smoking behavior of the experimental and the control groups after and before the treatment

the formed behavior. When examined thoroughly, this research result showed that at first the smoking behavior emerges because one wants to try smoking due to the influence of the environment. This behavior is then developing and for some persons, it becomes his habit because there are some tolerance from the environment such as no prohibition from the wives no protest from the children and the like. Therefore, the keyword to prevent the smoking behavior is “don’t want to try”. After trying it, the smoking behavior is maintained and well developed, even in Bali in general, especially in Pupuan village. In some communities in Bali in general and especially in Pupuan village, there is a tradition of providing cigarettes as part of the consumption provided for the guests or those coming to take part in the activity of mutual cooperation (gotong royong) to do a hajatan (Balinese: Kundangan) (a ritual or ceremonial feast). This tradition has a chance to cause such smoking habit among the adolescents who often come in kundangan. As a result, it is important to study whether this tradition will be stopped or continued.

The intensity of smoking behavior among the smokers Pupuan village, Tegallalang sub-district, Gianyar Regency in general may be categorized into the moderate

smokers, since the mean number of cigarettes consumed a day is 16.8 (under moderate smokers) but there are still 12.77% of the whole members of the studied population who may be included into heavy smokers. Either heavy or light smokers are actually unimportant to debate, the most important thing is that the smoking behavior among the people should be prevented, reduced even if possible stopped at all, since there is no advantage from the smoking behavior. Some people say that smoking means giving some foreign exchange to the nation because each money used to buy cigarettes has included the tax to the state. This opinion should be refuted with an idea that the state's incomes should be obtained from any efforts that may be harmful for the people either individually or collectively.

From the result of this research, it is also found out that in general the self-modification program effectively had reduced smoking behavior among the smokers in Pupuan Village, Tegallalang sub-district, Gianyar Regency. It can be seen from the significant decrease in the number of cigarettes consumed by the experimental group after the treatment for 2 weeks. The reduction of the number of cigarettes consumed was still sustainable although after the treatment was stopped for 2 weeks. This finding is in line with finding that intervention to the smoking behavior plays an important role in promoting and supporting the efforts to stop smoking. It is also compatible with Riley *et al.* (2002) finding that self-help behavioral interventions produce some reductions in the level of smoking sustainably until the smoking behavior stops.

However, this research results have not satisfactory yet, since the treatment given failed in stopping all members of the experimental group to smoke. Of 10 persons from the experimental group, 3 persons (30%) really stopped smoking. Others still consumed 4-8 cigarettes a day. Although, it should be admitted that significant reduction in the number of cigarettes consumed every day has happened.

After being thoroughly examined, the failure of the self-modification program to make all members of the experimental group stop smoking is not because this program is not good but it is the members of the experimental group who had low commitment in implementing the program seriously. From the diary used to record the implementation of the self-modification program, it seems that the 3 members of the experimental group who really stopped smoking implemented the program seriously. Others did not do the program well for example, they did not do the training every day or did not do all 3 training activities: each day after getting up in the

morning, he seriously promised not to buy cigarettes in the day; each day he should bear not buying cigarettes although he wanted in the day and each day he should bear not smoking although he wanted to.

Therefore, it can be stated that the key word to stop smoking is the firmness to do the self-modification program seriously. In other words, a real desire complemented with firm behavior without any doubt not buying cigarettes each way will be able to stop smoking behavior.

## CONCLUSION

On the basis of the research result, some conclusions may be drawn. Firstly, the initial causes of the smoking behavior among the smokers in Pupuan village, Tegallalang sub-district, Gianyar Regency are as follows: the influence from the smoking peer groups, trying it out while chatting in the food stalls, trying it out by oneself, since one sees other smoke after enjoying dishes in the *kandangan*, showing masculinity, trying it out by oneself after seeing others enjoy the smoking activity and imitating the parents. Then the causes whether the smoking behavior is continued or maintained by the smokers so that they become smokers are the tolerance from the environment namely: no prohibition from the parents or the wives no protest from the children, getting satisfaction, helping concentrate in work and other activities and filling in the leisure time.

Secondly, the intensity of smoking behavior among the smokers in Pupuan Village, Tegallalang sub-district, Gianyar Regency is under the moderate category. Of the 94 members of the population 22 persons (23.4%) are light smokers, consuming <11 cigarettes per day; 60 persons (63.8%), moderate smokers, 11-20 cigarettes per day; the rest, 12 persons (12.8%) are heavy smokers, consuming more than 20, even 60 cigarettes per day. The activity of the smokers had lasted for more than 1 year.

Thirdly, the self-modification program in general is effective in reducing smoking behavior but it merely stopped the smoking behavior of 30% training participants (the experimental group).

## SUGGESTIONS

Based on the research findings as concluded above, some suggestions are offered. Firstly, each person should prevent any smoking behavior since smoking is harmful for health. To prevent the smoking behavior effectively, no way is reached, except not to start trying to smoke. Secondly, the tradition of some communities in Bali, especially in the community of Pupuan Village,

Tegallalang sub-district, Gianyar Regency, providing cigarettes as part of the consumption to welcome guests or to do gotong royong in helping one family's hajatan should be reviewed, since this tradition may increase the number of smokers in the community and this is really dangerous for the health. And thirdly for the smokers, they should stop smoking by, among others, implementing the self-modification program seriously.

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