The influence of cigarette consumption as a trigger of relapse tendency in productive drug abusers

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Abstract. One of the effects of globalization in Indonesia is the increase in drug abusers. In the last 3 years, there has been an increase in drug abusers and tobacco consumption in the productive age group. At the Drug Rehabilitation Centre, National Narcotics Boards in 2015 until 2018, there was an increase in abusers to relapse from 5% to 6.3%. This study aims to analyze the influence of smoking behaviors on the tendency of relapse and to compare smoking and non-smoking on the decline in drugs abusers in the Rehabilitation Center. This research uses a quantitative approach. The sample of this research is 162 respondents who were drug abusers undergoing rehabilitation. A questionnaire collected data. Factor analysis is used to process the data of the independent variables. Coping was the most dominant factor in relapse tendencies. Results indicate that smoking behavior can reduce the tendency of relapse in drug abusers in the Drug Rehabilitation Center. We recommend conducting further research on what kind of coping is suitable for drug abusers to reduce the tendency to relapse and review the smoking cessation policy at the Drug Rehabilitation Center. Another suggestion is to taper the dose of cigarette use on drug abusers.

1. Introduction

The prevalence of drug abusers in Indonesia in 2017 reached 1.77% or 3,376,115 people. The number of abusers who have used drugs last year (current users) in the age group of 10-59 years [4]. The drug problem is the impact of globalization, where there is an exchange of people (migration) and goods (export imports) [1]. That is supported by the Indonesian archipelago's geographical location and shape, where there are entry points for illegal trade. Illicit drug circulation is very risky to attack productive age groups. Based on data from the Drug Rehabilitation Center, National Narcotics Board, Lido, Indonesia, in June 2019, most drug abusers are 18-34 years old. This age range belongs to the productive age. The rise of drug abuse must be in line with the ease of access to drug treatment for drug abuse or dependence. Therapy for drug dependence must be a holistic and sustainable rehabilitation program. This treatment allows abusers to counter addiction disorders' effects on their brains and behavior and regain control of their lives [23].

The drug problem certainly does not stop when abusers enter the rehabilitation institution. The thing that is quite worrying is the high number of drug abusers is proportional to the high number of relapses. Relapse is the process of re-occurring patterns or long cycles of abusers where drugs occur routinely. Marlatt and Gordon stated that relapse is a process where abusers return to using drugs after going through a period of abstinence during the rehabilitation process [19]. Relapse is considered an...
individual failure of behavioral change during a recovery process. Gorski and Miller explain that relapse is a complex process involving psychological, biological, and social relations [14]. If someone cannot get out of the problem or the pressure experienced, he will return to use drugs with increasing doses.

Based on primary data at the Drugs Rehabilitation Center, National Narcotics Board (NNB), Lido, there was an increase in relapse cases in the 2015-2018 period. In 2017, the number of abusers was 686, and the deterioration (relapse) was 46 people (6.7%). Furthermore, 2018 data, the number of abusers is 716, and the decay is 45 people (6.3%). In 2015-2017, relapse abusers experienced an increase. Anticipatory measures are needed so that this upward trend does not recur in subsequent years.

According to Marlatt and Gordon, four (4) aspects influence relapse tendencies, namely high-risk situations, coping, outcome expectancies, and abstinence violation effect [19]. A high-risk situation is a condition or status experienced by a drug abuser either when there is social pressure or when positive or negative emotions occur. In addition to considering the four (4) aspects of the relapse tendency, it is essential to consider the factors that trigger drugs, abusers, to relapse again. One of the triggering factors is the use of cigarettes. The data above shows that the prevalence of tobacco use in Indonesia, especially among the productive age groups, increases. That is raising concerns because, in Astuti's study, smoking is one of the causes of drug abuse [3]. Considering the dominance of drug abusers and the smoking prevalence data issued by the Ministry of Health, it raises whether smoking is indeed linked to drug abuse. This statement is in line with Harell's research, which explains that smoking can be an "entry point" for drug abuse [16].

These studies are in line with the results of Zolala's study, which states the relationship between smoking and drug abuse is as said "Smoking is often regarded as a 'gateway' to drug use across several settings [32]. That could also be the case in Iran, where about 93.5% of PWUD had smoked cigarettes before they started illicit drug use.” This study's novelty is that the authors modify the relapse tendency questionnaire to be suitable for application in rehabilitation programs. Researchers developed a model based on the cognitive-behavioral model of relapse developed by Marlatt and Gordon [19]. Besides, the authors also reveal the effect of smoking as a trigger for drug abusers' tendency to relapse. This research was conducted to support the P4GN program, namely Prevention, Abuse, Eradication, and Illicit Drugs Circulation, in the National Narcotics Board specifically related to recurrence prevention. This study's conceptual framework is based on four independent variables (based on theory)—that effect on the scale of the tendency to relapse of drug abusers. We used a moderate variable (smoking behavior) to strengthen the dependent variable's effect of four independent variables.

2. Method
This study uses quantitative data analysis with two stages; namely, the first stage uses factor analysis to determine the number of variables, and the second stage uses multiple regression analysis. The exogenous latent variable is the aspect of a high-risk situation (X1), coping (X2), outcome expectancies (X3), and the abstinence violation effect (X4). The operational definition of the high-risk situation is a situation that a drug abuser can experience, both in times of unfavorable emotional conditions, cases involving other people, social stress, and positive emotional states. Coping is the ability of drug abusers to deal with a high-risk situation. Then, outcome expectancies are the anticipation of drug abusers of the effects of future relapse. Last, the abstinence violation effect is an emotional reaction to the behavior of using substances again.

The moderate variable is the smoking behavior (Z) obtained from two factors. These factors were measured from the length of smoking times the average number of cigarettes smoked per day. If less than 200 are said to be light smokers, between 200 - 599 said to be moderate smokers and if more than 600 are said to be heavy smokers. The longer a person smokes and the more cigarettes smoked per day, the more severe the degree of smoking [25]. The scale used in this variable is ordinal. Not smoking is an abuser who did not have smoking behavior before entering rehabilitation. Expressed by
the number one (1). Light smokers are drug abusers who have smoking behavior with a result of less than 200. Represented by a number two (2). Moderate smokers are drug abusers who have smoking behavior with consequences between 200 - 599. Expressed by the number three (3). Heavy smokers are narcotics abusers who have smoking behavior with a result of more than 600. Represented by the number four (4).

The dependent variable is the scale of the tendency of relapse of drug abusers (Y)—the criteria for relapse tendency divided into very low, low, medium, and high. Research subjects were abusers who were undergoing rehabilitation at the Drugs Rehabilitation Center, National Narcotic Board (NNB), Lido. The sampling technique uses random sampling. The number of samples using the Slovin formula obtained as many as 150 samples from 240 abusers. However, in the field, there were 162 respondents. According to quantitative research principles, the author decided to use the entire questionnaire data, the more samples, the better.

Data analysis uses factor analysis and multiple regression methods. Factor analysis in this study used to process the data which explained each of the independent variables. The data of smoking behavior (Z) converted into interval data using the MSI (Method of Successive Interval) technique. To analyze the effect of smoking behavior on drug abusers towards relapse tendency using multiple regression techniques. Data were processed using SPSS 23. The regression equation design in this study is as follows:

\[ Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_1Z + b_6X_2Z + b_7X_3Z + b_8X_4Z + e \] (1)

3. Results and discussion

The factor analysis result shows that all the questions on the questionnaire are proven valid and reliable. The reliability of the data indicated by the Cronbach's alpha test value of 0.859 (higher than the standard 0.7). Meanwhile, the data validity show from the results of the corrected item-total correlation test greater than 0.3. Furthermore, the high-risk situation variable explained by drugs is an item that must be present when celebrating something (loading factor: 0.714). The coping variable was defined by increased self-confidence while using drugs (loading factor: 0.762). The outcome expectancies variable is defined by not being reluctant to take money/family property when using narcotics (loading factor:0.669). Finally, the variable absence violation effect is described by the inability to refrain from using drugs again (loading factor: 0.749).

The first regression equation results show that a high-risk situation, coping, outcome expectancies, and abstinence violation effect influence the tendency of relapse, which is all the independent variable significance on level 1%. All variables are explaining the relapse tendency scale by 68.2 percent. That shows that there is still 31.8 percent of other aspects that influence the tendency to relapse in drug abusers. All of the variables' independent significance effect to relapse tendency on 1% level.

The regression equation obtained from the analysis results is:

\[ Y = 2.761 + 0.459 X_2 + 0.382 X_1 + 0.285 X_3 + 0.178 (X_4) \]

\[ \text{t-stat} \ (12,489)*** \ (10,414)*** \ (7,776)*** \ (4,860)*** \]

\[ \text{Adj-R}^2 (0.682), \ F\text{-stat} (87,126)*** \]

\[ \text{Hint.} *** \text{sig} (0,01) \]

Then secondary regression analysis is performed between the independent, moderate, and dependent variables. The results show the determination value (in the adjusted R2 column) of 0.651. This test's significance is 0.025 (2 sides), and the df value is 4, then the t-table value is 2.776. In the X1Z variable (coping times smoking behavior), the t value is 11,659, then the amount of t value > t table so that H0 is rejected. The accepted hypothesis is that coping with smoking as a trigger partially influences relapse tendencies. This value indicates that the impact of relapse tendency aspects (X) with smoking behavior as a trigger (Z) can explain 65.1 percent of the tendency of drug abuser relapse. It means some other factors or triggers can explain 34.9 percent of relapse tendencies. F value is 76.121,
so Ho is rejected because of the estimated F value > F table. The accepted hypothesis is that there is a significant influence between smoking behavior as a trigger for relapse tendencies.

In this analysis, smoking behavior as a moderate variable (Z), which has been multiplied by all independent variables, influences the dependent variable (Y), which is the tendency to relapse. The regression equation obtained from the analysis results is:

\[
Y = 2.731 + 0.145 (X_1Z) + 0.114 (X_2Z) + 0.089 (X_3Z) + 0.054 (X_4Z)
\]

The regression equation above states that in one unit relapse tendency variable is also influenced by smoking behavior as a trigger, influenced by the coping variable by 0.145, the high-risk situation variable by 0.114, and the expectancies outcome variable by 0.089 the abstinence violation effect variable by 0.054. All variables show a positive sign or increase the tendency to relapse. Based on the regression equation model described earlier, the results show that the regression model with smoking behavior reduces the likelihood of relapse more than the regression model without smoking behavior. These results indicate a decrease in the magnitude of the effect of smoking behavior on relapse tendencies from 68.2 percent to 65.1 percent.

This study's analysis results found that smoking behavior can help decrease the likelihood or tendency of relapse. That is seen from Y’s value, which has been reduced from the first and second regression equations above. Van Leeuwen's gateway theory said that drug abuse results from previous smoking behavior [30]. The results of this study reinforce the Gateway theory in both positive and negative terms. The positive side is that cigarettes can reduce the tendency to relapse even though smoking behavior also causes drug abuse. The results of this thesis are following Campbell's research [8]. In general, there is no scientific evidence (evidence-based) stating that the drug abuser who smoke significantly increase their relapse [8]. Common symptoms reported by subjects in the Campbell’s study were related to requests for nicotine replacement treatment [8]. Most subjects reported an urgent appeal to use cigarettes/nicotine instead of using drugs or other substances. The study results revealed that smoking can reduce the tendency to relapse, proving that smoking does not always negatively impact. Bellew et al. (2015) research show that cigarette use (tobacco) provides little protection or a positive effect on several diseases. Further research on the mechanism by which smoking can have a protective effect or a positive impact on the development of the illness and psychology certainly can provide therapeutic benefits [5].

The prevalence of smoking was found to be higher among people with psychiatric problems. Lasser et al. found that one of the driving factors for smoking behavior is that tobacco, by some individuals, can be considered a way to eliminate the unpleasant feeling of symptoms of mental illness. Therefore smoking can be considered beneficial [20]. Drug abuse is related to psychiatric disorders [28]. Some drug abusers undergoing treatment at the Drug Rehabilitation Center also have mental problems. Smoking reduces the tendency to relapse because it can reduce the discomfort experienced by abusers during the rehabilitation program [11]. Abusers tend to re-use drugs to relieve feelings of pain or discomfort [11]. Because they are undergoing rehabilitation, abusers need cigarettes to substitute for drugs to deal with unpleasant feelings. There is evidence that the way nicotine works to improve mood and concentration is more transparent or more significant in some abusers with depression and cognitive problems [29]. Also, nicotine is known to help relieve unwanted side effects from drug abuse treatment, especially abusers who are treated with antipsychotic drugs [20]. According to survey results showing that smoking can reduce the tendency of relapse, it is strengthened from the data obtained on supporting questions in the questionnaire. Most respondents (31 percent) stated that smoking could divert their desire to use drugs (Figure 1). This result shows that respondents whom drug abusers need cigarettes as a substitute for not using drugs. Drug Rehabilitation Center must find a solution to accommodate smoking as a distraction from drug abuse.
The positive impact of using herbal cigarettes show in the results of a study conducted by Carpar et al. [9]. The ingredients used as nicotine substitutes are thyme type plants. These are analgesic (anti-pain), antiseptic, antitusive (cough medicine), and spasmylytic (anti-cramping). Studies show that oil and thyme extract have antitumor, antimicrobial, and antioxidant effects [9]. The use of thyme is recommended by algologists (experts in the field of algae plants) because of its antinociceptive effect (to reduce pain). In the literature on psychotropic effects, thyme is used to reduce nightmores and headaches. Also, the inhalation of thyme vapor is useful for epilepsy therapy [9]. Based on Carpar's findings, cigarettes with thyme content could be a solution to nicotine cigarette replacement at the Drug Rehabilitation Center. The benefits of thyme, such as antioxidant, analgesic, antinociceptive, and psychotropic effects, can help in the recovery process of drug abusers [9].

Figure 1. Question: What are the effects of smoking nicotine related to illegal drug use?

Another innovation that can be done by the Drug Rehabilitation Center related to this finding states that smoking can reduce the tendency to relapse by gradually reducing nicotine. Cessing smoking abruptly and not accompanied by mentoring impacts the emotional and psychological side of drug abusers [31]. It can make the recovery process ineffective and can contribute to the possibility of increasing relapse. To overcome this, the Rehabilitation Center can gradually create a nicotine reduction policy (nicotine fading) while training the emotional preparedness of abusers with more holistic coping skills training. The cigarettes are no longer used as a tool to stop drugs, but emotional readiness and maturity, as well as the behavior of abusers.

Brown et al research found that nicotine fading is one of the strategies for distress tolerance (stress tolerance) [7]. Based on Brown's research, the reduction of nicotine (nicotine fading) can be one solution to reduce the emotional impact of abusers due to smoking cessation at the Drug Rehabilitation Center. It is because in this study was found that smoking behavior can reduce the tendency to relapse [7]. So that if a cigarette stopped abruptly, then the possibility of abusing drugs for relapse increases. A strategy is needed, so that drug abusers do not become stressed, which leads to relapse with the cessation of cigarettes. Currently, the smoking cessation program has been running at the Drug Rehabilitation Center, National Narcotics Board, Lido, Indonesia. Of course, changing back on a policy takes time. The results of this research can become the basis for the implementation of a system. Another solution related to the effects of research that states that smoking can reduce the tendency to relapse are implementing a standard smoking cessation treatment program at the Drug Rehabilitation Center. Friedmann's study found that treating or stopping tobacco smoking among drug abuser patients is a priority that must do [13]. There are standards in the form of five (5) A's that must carry out so that the smoking cessation program can be successful.

Providing smoking cessation services at rehabilitation centers for drug abuse is a positive strategy for rehabilitating drug abusers who smoke. Research conducted in the United States shows that many rehabilitation patients who abuse drugs are very interested in quitting smoking. In contrast to the study
results at the Drug Rehabilitation Center, smoking can prevent relapse. A structured and systematic treatment plan follows the smoking cessation program's standards to help the abuser stop doing drugs / other substances [2]. Also, the National Institute on Drug Abuse recommends combination therapy for smoking cessation as evidence-based practice in the treatment of drug abuse [13].

Researchers offer a tapering dose treatment model of cigarette smoking to support implementation at the Drug Rehabilitation Center. It is because researchers try to analyze the effects associated with smoking cessation in rehabilitation institutions. There is a tendency to decrease the number of drug abusers who come to rehabilitation sites due to the enactment of smoking cessation policies. Families usually seek information about rehabilitation before an abuser arrives and is registered at the Drug Rehabilitation Center. Some abusers' families do not believe that the rehabilitation programs will succeed, considering that therapy to stop drug dependence is a complicated process, coupled with smoking cessation therapy, which they think is a tool to reduce drug consumption. Therefore, they chose to look for other therapy programs outside this Rehabilitation Center.

Another possible reason for the research results that showed smoking behavior could reduce the tendency to relapse is because smoking is one of the coping strategies for drug abusers in overcoming problems. Rosario says more tobacco literature is related to stress than about the effectiveness of smoking itself as a coping strategy that aims to reduce feelings of depression, anxiety, and other psychological distress due to stress [26]. In a qualitative study conducted by Nichter, it argued that smoking is a consumption event that facilitates social interaction "time-out" and "time-bounded" [24]. Smoking was an effort to divert the mind from events/individuals who create stress and help focus the mind when under pressure. The invitation to smoke even though one bar can create opportunities for interaction can reduce stress. Smoking opportunities are also used as an efficient time marker. It follows the conditions that occur at the Drug Rehabilitation Center; Lido, drug abusers, need smoking as a coping strategy that aims to reduce stress because they do not use drugs. The occurrence of positive life changes can be associated with a reduction in drug abuse.

4. Conclusion
There are influences of cigarette consumption due to relapse tendency in productive drug abusers at Drug Rehabilitation Center, National Narcotics Board, Lido, Indonesia. These results indicate that smoking behavior can reduce the tendency of relapse in drug abusers in the Drug Rehabilitation Center. The study results reinforce the Gateway theory, where smoking can also trigger drug use and reduce the tendency to relapse.

Coping was the most dominant factor in relapse tendencies. Therefore, it is necessary to conduct further research on what kind of coping is suitable for drug abusers to reduce the tendency to relapse. We recommend reviewing the smoking cessation policy at the Drug Rehabilitation Center. Nicotine cigarettes can replace with herbal cigarettes with health considerations. Another suggestion is to taper the dose of cigarette use on drug abusers. Also, drug abusers are expected to improve their coping skills to help themselves reduce relapse tendencies. Drug abusers who have adequate coping skills can increase personal resilience to not fall back on drug abuse.

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