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Counseling Effect on Smoking Cessation Behavior in Junior High School Students

Pengaruh Konseling terhadap Ketahanan Berhenti Merokok pada Siswa SMP

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ABSTRACT
The prevalence of smoking habits among children and adolescents has increased quantitative and qualitative, which further elevates the risk of diseases. Furthermore, the 2014 Global Youth Tobacco Survey (GYTS) (data showed the intention to quit smoking by 88.2% of students, although only 24% received assistance in affiliated programs; hence support is required from the immediate environment. Therefore, the purpose of this research, was to determine the effect of counseling in the success of smoking cessation in junior high school students. The research design used was a prospective cohort. The subjects of this research include all junior high school students with the smoking habit, of which 40 participants were selected. These respondents were provided with smoking cessation counseling for six sessions (4 months). Survival analysis was used to evaluate the data collected. After the six counseling sessions, the cessation success and failure rates were 75% and 25%, respectively. Smoking cessation was related to nicotine addiction (p<0.001; Adj.HR 25.2; 95% CI 4.9-129.9) and activeness in counseling (p=0.001; Adj.HR 12.8; 95% CI 2.8-57.9). This research is expected to help students with the smoking habit terminate the practice, subsequently reducing the prevalence in Poso Regency.

ABSTRAK
Perkembangan perokok di kalangan anak-anak dan remaja semakin meningkat, baik secara kuantitas maupun kualitas. Angka perokok pada usia remaja yang tinggi meningkatkan risiko penyakit. Data Global Youth Tobacco Survey (GYTS) 2014 menunjukan 88,2% siswa yang merokok sebenarnya ingin berhenti merokok, walaupun hanya 24% yang pernah menerima bantuan program untuk berhenti merokok. Oleh karena itu, diperlukan dukungan dari lingkungan mereka untuk membantu dalam usaha berhenti merokok. Tujuan penelitian ini untuk mengetahui pengaruh konseling dalam keberhasilan berhenti merokok pada siswa SMP. Desain penelitian yang digunakan adalah kohort prospektif. Subjek penelitian ini adalah semua siswa SMP yang merokok berjumlah 40 siswa. Subjek penelitian diberikan konseling berhenti merokok selama 6 sesi (4 bulan). Analisis data yang digunakan adalah analisis survival. Setelah mengikuti 6 sesi konseling terdapat 75% responden yang berhasil berhenti merokok sedangkan 25% gagal berhenti merokok. Variabel yang berhubungan dengan keberhasilan bertahan berhenti merokok adalah ketergantungan nikotin (p<0,001; Adj.HR 25,2; 95%CI 4,9-129,9) dan keaktifan mengikuti konseling (p=0,001; Adj.HR 12,8; 95%CI 2,8-57,9). Penelitian ini diharapkan bisa membantu siswa yang merokok untuk menginisiasi berhenti merokok dengan harapan jika usaha tersebut berhasil maka akan menurunkan prevalensi merokok pada siswa di Kabupaten Poso.

INTRODUCTION

Tobacco smoking is the leading cause of premature death and disabilities. However, the global target of reducing early mortality by 25% in 2025 requires a substantial increase in the number of smokers making efforts to quit. Furthermore, the success rate is observed consistently and significantly increase in low, middle and high-income countries.[1] The use of Tobacco is attributed the leading cause of preventable death, globally, being linked to nearly 6 million cases per year, according to The World Health Organization (WHO). This statistics is, however, expected to increase to over 8 million in 2030.[2]

Tobacco use in adolescence increased substantially in Bhutan, Myanmar, and Nepal, as one of ten students between the 13-15 year age group smoke in many ASEAN countries, including the Maldives, Indonesia, Thailand, and Timor-Leste. Furthermore, about three out of four teen smokers have been statistically proven to progress into adulthood with the habit. The rising use of e-cigarettes, shisha (waterpipes) and other new forms of smokeless tobacco are expected to reverse tobacco control's initial achievements. The Sustainable Development Goals (SDGs) and the Global Noncommunicable Diseases (GNDs) Action Plan are targeted at reducing tobacco use in ASEAN countries by 30% in 2025. This is achievable through the implementation of a full MPOWER package, with a focus specialization on the youth population.[3]

In Indonesia, 36.2% of boys and 4.3% of girls (comprising 20.3% of all students) are currently engaged in tobacco use, through smoking and or without smoke, of which 18.3% consume cigarettes.[2] Furthermore, supporting data from Central Sulawesi showed an increase in the number of users from 24.6% in 2007 to 26.2% in 2013, 22.2% and 28.9%, respectively, in Poso Regency.[4] The results of a research conducted by Ramadhan at 4 junior high schools in Poso City showed a prevalence of 25.7 for students engaged in smoking activities.[5] Also, a recent study in 5 senior and 6 junior high schools in the Regency showed a prevalence of 24.8% and 13.8%, respectively, encompassing 19.6% of the entire student population.[6] Most teenagers (47.2%) that initiate smoking behaviors become addicted to cigarettes, as indicated by the heightened desire and compulsion after waking up. This information is important because the affected students are very young. However, most (88.2%) wanted to quit smoking, and only a quarter (24%) had previously received assistance from affiliated programs, based on the GYTS 2014 survey data.[2]

Most novice smokers are teenagers without proper education on the impact of smoking, including the estimation of futuristic costs borne from nicotine addiction. These expenses were perceived to result from the weakness of adult smokers to make the quitting decision as teenagers. In addition, smoking is also considered a normal activity as some participants easily obtain cigarettes from family members or friends. The habit as seen as interesting, due to its ability to promote interaction and concentration and make life easier.[7]

Nonpharmacological interventions were used effectively and extensively to support patients in the act of quitting, with increasing success rates in most systematically evaluated approaches. Moreover, a combination of interventions, including smoking bans plus individual counseling, seems to be more effective compared to a single approach, while the addition of pharmacotherapy proved to further elevate success rate. In addition, the adoption of new technologies enables the provision of inexpensive smoking interventions to many patients, with the hopes of achieving better abstinence level in the future.[8] The combination of pharmacological nicotine replacement therapy (NRT) with nonpharmacological counseling increases the success rate by 15%, after treatment for a year. The proportion was higher than NRT (8.7%) alone but lower than counseling therapy (19%).[9]

There are several studies on smoking cessation counseling in Indonesia, but the subjects are adults and the method used is cross-sectional and quasi-experimental.[10,11,12,13] In this study, the subject are teenagers and the research design is cohort prospective. The purpose of this research was to determine the effect of counseling in the success of smoking cessation among junior high school students.

MATERIAL AND METHOD

The research design used was a prospective cohort performed in SMP Negeri 1 dan 4 Poso Pesisir, on August 20 - November 18, 2018. The samples include all students that smoked and were willing to participate, and the screening results lead to the selection of 40 from both schools. This study follows the sequence: 1. Screening students to determine the smokers by measuring CO levels, using a smokerlyzer co-detector; 2. After the selection of respondents, a pretest was carried out among respondents chosen; 3. The provision of smoking cessation counseling (counseling using 5A's method (Ask, Advise, Assess, Assist, Arrange)[14]; 4. The continuity of counseling for at least 6 sessions, within an interval of 2 weeks between each, was conducted at 30-60 minutes; 5. all meetings were evaluated by measuring the CO levels (COppm and% COHb) of each respondent. The definition: 1) Status of smoking cessation: Successful if the respondent succeeds in quitting smoking in the last session; failed/relapsed if the respondent relapses to quit smoking in the last session; 2) Nicotine addiction: Low if the phagestrom score is 0-3; Moderate if the phagestrom score is 4–6; High if the phagestrom score is 7–10; 3) Activeness: Active if attendance all of the entire counseling session; Less Active: inability to attend one or more counseling sessions; 4) Family members that smoke: No if there are no family members of respondents that smoke; Yes if there are family members of respondents that smoke.

Data were analyzed using STATA version 15.1 (10). A $p<0.05$ was considered statistically significant. Bivariate analysis using the Chi-square test for categorical variables and independent t-test for numerical variables. Multivariable analysis with cox regression (survival analysis). Survival analyses were conducted to explore the associations between the success of smoking cessation and various factors. The results were reported using adjusted Hazard Ratios (HR) and their 95% Confidential Interval (CI). Ethics approval for this study was issued by Poltekkes Kemenkes Palu, with No. LB.01.01/KE/0153/ VII/2018.

RESULT

This study was conducted for 4 months with six meeting sessions. There were no respondents who dropped out during this study. Table 1 shows an average respondents age of 13.8 ± 1 years, while the age of first-time smoking was 11.4 ± 1.4 years. Futhermore, about 87.5% live with people that smoke, 10% exhibited moderate addiction to nicotine, and 87.5% participated actively in counseling. Conversely, over half (55%) of the respondents claimed following friends as the first reason to initiate smoking, while 35% was due to trial and error. At the end of 6 counseling session attendance, 75% succeeded in qiutting smoking while 25% failed. Of 25% failed, 70% relaps after 5th weeks.

Table 2 shows respondents without family members possessing the smoking habit (80%), while 83.3% experienced low nicotine addiction and 82.9% of active participants in the counseling program successfully quit smoking. Table 3 shows the average age of 13.8 ± 1 year for respondents that successfully quit smoking, while 13.9 ± 0.7 years failed. Furthermore, the average age for first time smokers was 11.5 ± 1.6 and 11.3 ± 0.7 years, respectively. Table 3 shows a mean COppm level of 4.60 ± 2.9 for failed respondents, while 1.47 ± 0.6 successful. Conversely, the average %COHb level was 0.90 ± 0.1, and 1.34 ± 0.4, respectively.

The survival analysis of resistance to smoking cessation is shown in figure 1, where half of the respondents with moderate addiction experienced relapse in the 3rd week of counseling, which expanded to all participants as of the 7th week. Conversely, the resilient proportion of participants with low addiction reached 0.833 at the end of the study (10th week). Figure 2 shows the analysis of quit smoking survival rate on the 5th week of counseling, and half of the less active participants experienced a relapse. In addition, a proportion of 0.829 active respondents-maintained resilience up to the research termination (10th week), which was 0.200 for inactive participants.

Table 1. Characteristics of Respondents

Variable	Mean ± SD	n = 40	%
Age	13,8±1,0		
Age of First Time Smoking	11,4±1,4		
Families who Smoke			
No		5	12.5
Yes		35	87.5
Nicotine Addiction (Phagestrom Score)			
Low		36	90
Moderate		4	10
Activeness in Counseling			
Active		35	87.5
Less Active		5	12.5
The Content of Nicotine			
PPM Pre	2,7 ± 1,0		
PPM Post	2,3 ± 2,0		
%COHb Pre	1,1 ± 0,1		
%COHb Post	1,0 ± 0,3		
The First Reason of Smoking			
Trial and Error		14	35
Forced by Brother		1	2.5
Following Friends		22	55
Like it		3	7.5
Smoking Cessation Status			
Successful		30	75
Failed/Relapsed		10	25
Time of Relaps			
Earliest (Relaps Before 5th Weeks)		2	20
Median (Relaps in 5th Weeks)		1	10
Latest (Relaps After 5th Weeks)		7	70

Source: Primary Data, 2018

Table 2. Relationship Between the Research Variables on Smoking Cessation Success

Variable	Smoking Cessation Success				*p*
	Successful		Failed		
	n	%	n	%	
Families who Smoke					
No	4	80	1	20.0	1.000*
Yes	26	74.3	9	25.7	
Nicotine Dependence					
Low	30	83.3	6	16.7	0,002*
Moderate	0	0	4	100	
Activeness in Counseling					
Active	29	82.9	6	17.1	0.010
Less Active	1	20.0	4	80.0	

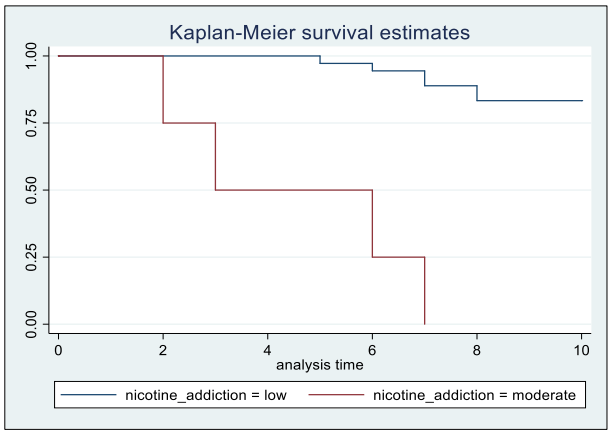
Source: Primary Data, 2018
*Calculated using chi-square test

Research variables included in the survival analysis modeling were nicotine addiction and activeness in counseling sessions, as shown table 4, variables related to success in quitting smoking were nicotine addiction (p<0.001; Adj HR 25.2; 95% CI 4.9-129.9) and activeness in the follow-up of counseling (p=0.001; Adj HR 12.8; 95% CI 2.8-57.9).

Table 3. Differences in Average Age, Age of First Time Smoking, Coppm Level, and % Cohb Level of Smoking Cessation Status of Respondents

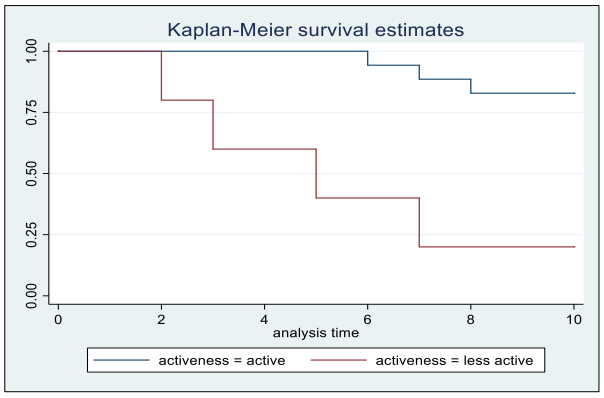
Variable	Status	n	Avarage ± SD	*p*
Current Age	Successful	30	13.8 ± 1.0	0.779*
	Failed	10	13.9 ± 0.7	
The First Age of Smoking	Successful	30	11.5 ± 1.6	0.644**
	Failed	10	11.3 ± 0.7	
COppm Level	Successful	30	1.47 ± 0.6	0.008**
	Failed	10	4.60 ± 2.9	
%COHb Level	Successful	30	0.90 ± 0.1	0.010**
	Failed	10	1.34 ± 0.4	

Source: Primary Data, 2018
*Calculated using chi-square test; **Calculated using an independent t test



Source: Primary Data, 2018

Figure 1. Comparison of Quit Smoking Survival Rate Based on Nicotine Addiction



Source: Primary Data, 2018

Figure 2. Comparison of Quit Smoking Survival Rate Based on Activeness in following Counseling

Table 4. The Survival Analysis Model of Smoking Cessation

Variable	Adjusted HR (95% CI)	*p*
Nicotine Addiction		
Low	1.0	0.001
Moderate	25.2 (4.9 – 129.9)	
Activeness in Counseling		0.001
Active	1.0	
Less Active	12.8 (2.8 – 57.9)	

Source: Primary Data, 2018

DISCUSSION

In our study, smoking cessation rate were 75%. This finding is higher than the previous study which only reached 53.7%.[15] Many smoking cessation strategies that have been developed and implemented successfully in Western nations have not had the same level of success in South Asia.[16] According to several studies conducted in Malaysia, the smoking cessation rate is greater than 30% and can reach as high as 45%.[17,18] Our findings are higher because the respondents are teenagers who still smoke secretly, while the other research respondents are adults.

The evaluation of nicotine addiction was performed two ways, including the measurement of CO levels in part per million (ppm) and carboxyhemoglobin (%COHb), with the help of a smokerlyzer and using the phagestrom score. Furthermore, a smokerlyzer is a non-invasive inspection tool used to evaluate carbon monoxide (CO) levels through the exhalation of breath, which helps assess and control the impact of smoke on active or passive smokers. These are also adopted in the process of quantitatively evaluating the level and status of a smoker, subsequently enabling the determination of suitable action/therapy. In addition, they are used as a visual aid for smokers to offer a better understanding of potential conditions, which helps facilitate encouragement towards quitting or reducing cigarette consumption at least.[19]

Based on the results, the average COppm level before counseling was 2.7 ± 1.0, which later dropped to 2.3 ± 2.0, while the % COHb was 1.1 ± 0.1, and 1.0 ± 0.3, respectively. However, these values were actually within the body content safe limit, assumed to have been due to the practice of smoking secretly. The most worrisome case was observed in one respondent with a COppm level of 9 (%COHb 1.8), which was classified in the "danger zone" level, and 11 (% COHb 2.4) was recorded for another and placed in the "smoker" category.

Based on the phagestrom scores recorded in table 1, low and moderate nicotine addiction was seen in 90% and 10% of the respondents, respectively. Conversely, the success of smoking cessation, as shown in table 2, was reported for 83.3% of respondents with low addiction successfully quit smoking, while failure was observed in 100% of moderate addicts.

The survival analysis of resistance to smoking cessation is shown in figure 1, where half of the respondents with moderate addiction experienced relapse in the 3rd week of counseling, which expanded to all participants as of the 7th week. Conversely, the resilient proportion of participants with low addiction reached 0.833 at the end of the study (10th week), characterized by an average smoking cessation survival rate time of 9.5 weeks. This was 4.5 weeks for moderate addicts, and the data presented in table 4 showed 25 times higher risk of quitting attempt failure.

Smoking is a difficult habit to refrain, and the process to ensure quitting is dynamic. This requires a series of desires, plans, attempts, failure, relapse, trying again in anticipation of complete rehabilitation. In addition, two-thirds of smokers declared the desire to quit, about one third made an effort, and only a few eventually succeeded.[20]

Nicotine dependence is closely related to the number of cigarettes consumed. Previous studies have reported that lower levels of cigarette consumption were associated with higher smoking cessation success rates.[21,22] Nicotine dependence is the major difficulty faced by smokers, resulting from the intrinsic ability to reach the brain upon consumption quickly, as the level in arteries rises sharply within 15 seconds. In addition, smoking cigarette leads to the stimulation of excessive dopamine production, which enhances bodily relaxation, therefore causing withdrawal syndrome, characterized by physical tolerance and addiction, when tobacco intake is stopped. This is characterized by the exhibition of anger, impatience, anxiety, difficulty concentrating, insomnia, increased appetite, and the feeling of depression,[23] which is experienced by over 80% of smokers.[24]

This study involves a total of 6 meetings, characterized by the measurement of nicotine in the

body, understanding smoking patterns, cessation declarations, and experiences, watching videos that relate to the dangers, learning to respect personal achievements, and inviting others to quit the habit. In addition, activeness is indicated by the respondents' capacity to attend all counseling sessions, which reached 87.5%. However, some children were observed to be less active after several days of absence; hence collaborations were made with the class teacher to facilitate attendance.

Our study reported 82.9% of active participants successfully quit smoking, while 80% of the less active failed. This indicates the presence of a directly proportional relationship between activeness and smoking cessation success. Figure 2 shows the analysis of quit smoking survival rate on the 5th week of counseling, and half of the less active participants experienced a relapse. In addition, a proportion of 0.829 active respondents-maintained resilience up to the research termination (10th week), which was 0.200 for inactive participants. The average survival rate times to quit were 9.5 weeks and 5.4 weeks, respectively, for active and inactive respondents. Table 4 concluded on the 12.8 times higher risk of failed attempts amongst moderate addicts.

The best approach towards quit smoking is to harbor a strong intent of complete rehabilitation,[25] as people in this category possess the excessive motivation to follow-up on cessation counseling programs. The recurrence rate for subjects with less than twelve months of abstinence ranged between 54% and 67%, indicating the first year after quitting as the highest risk period for relapse. This was high and did not decrease below 50% at the end of 12 months, demonstrating the time frame to intensify relapse prevention strategies. In addition, the possibility of relapse decreases over time but is never completely absent, especially at younger ages, where quitting paradoxically heightens the risk. This information is expected to help in the development of a more targeted and effective relapse prevention program.[26]

This is consistent with previous studies performed that there is high-quality evidence that individually-delivered smoking cessation counselling can assist smokers to quit.[27] The adolescents had a positive opinion about counseling and treatment for smoking cessation in health services.[28] Another research attributed three months of continuous abstinence as a successive critical period. This is characterized by an elevation in open access towards the possibilities of success, which is consistent with the main analysis and sensitivity.[29,30]

CONCLUSION AND RECOMMENDATION

Nicotine dependence (p=0.001) and activeness in counseling (p=0.001) were found to a have significant association with success in quitting smoking. Therefore, the school should cooperate with primary health care to provide smoking cessation counseling services to smoking students.

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