The Effect of the Stages of Change Model on Smoking of Risk-Taking Adolescents

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Abstract

In this study it was aimed to determine the abstract effects of applying the Stages of Change model on the cigarette consume of these adolescents due to the frequency of especially adolescent employees' risky behaviors. Adolescent Risk Taking Questionnaire was applied to the research volunteers at vocational training centers. By taking the results of the scale into account 63 adolescent smokers created the universe of the study. The carbon monoxide (CO) measurement levels, Self Efficacy points and the Stages of Change (SOC) of these adolescents were determined. According to the change stages, which the adolescents show during the session; at the beginning of the session it was determined that 76.2% were in the pre-thinking and 23.8% in the thinking stage. There was no adolescent determined in preparation, action or prosecution stage. While the sessions proceed it was seen that the adolescents move between 5 change stages. At the evaluation in the last session it was determined that 1.6% of the adolescents were in pre-thinking, 11.1% thinking, 63.5% preparation and 23.8% in the action stage. The differences between the first and the last session were statistically significant (p<0.01). The realized application is reducing cigarette consume. Especially to the adolescents working in the industrial region more consulting and support must be provided as they create a risk group regarding substance use. It must also be recommended that they take actively part in substance use avoiding programs and services.

Keywords: adolescent employees, the Stages of Change (SOC) Model, quit smoking, cigarette addiction, Adolescent Risk-Taking-Questionnaire (ARTQ)

Introduction

In the adolescent period, which is the period between childhood and adulthood; the adaptation of the individual with physical changes is realized together with the social and psychological changes in this period. Due to these changes most of the adolescents often face a number of crises and dilemmas. They could also show risky behaviors (start a gang, carry guns, substance use, etc.) while they struggle to prove themselves. In the researches related to smoking among risky behaviors it was determined that more of 80% cigarette addicts began to smoke before 18 (*CDC, 2012*).

It was revealed that the individuals in adolescent period show more tendencies to risky behaviors, and furthermore it was reported that risky behaviors are more seen in between 16-18 years (*Assante et al., 2014*). It was also determined that within risky behaviors cigarette addiction is created and in the creation of this addiction the influences of social environment and friends are really high (*DiClemente et al., 2001*).

The adolescents at vocational training centers have completed primary education and could not continue to the next class or were left out of formal education due to various reasons. These have at least completed primary education and are between the ages of 15-18.

These adolescents are employed individuals and their work environment are inadequate and crowded. In addition to that health and personality developments are negatively affected by inadequate physical conditions and hard work (*Dundar et al., 2008).* Due to these reasons the adolescents at vocational training centers are different from adolescents receiving formal education regarding their social environment.

In order to help adolescents to change their behaviors (substance use, violence, obesity, etc) that cause troubles in their life the Stages of Change (SOC) Model can be used. (SOC, often also referred to as the Transtheoretical Model-TTM) (*Deng et al., 2013; Riley & Fava, 2003*). The SOC model is useful for identifying appropriate interventions to foster positive behavior change (e.g., quitting smoking); by identifying where a person is in the change process, interventions can be tailored to the person's "readiness" to change (*Carlson et al., 2003*). This model also concerns about individuals' readiness to change attempts (*Prochaska et al., 2004*). Carbon monoxide (CO) measurement is also very important for enhance adolescents' motivation to quit smoking and to provide concrete feedback associated with their pulmonary status (*WHO, 1999*).

The professionals working with adolescents in order to develop the adolescents and maintain their health and also to remove risky behaviors, play an irrevocable role. These professionals must know the fundamental priniciples of appropriate approach for these adolescents and must guide the adolescents to maintain their health and to develop them. Avoidance and treatment of risky behaviors and care of an individual is a process that needs multidisciplinary cooperation. During this process it is the responsibility of the professional to protect the adolescent of the risky situation and remove it by changing the present attitude with the help of education (*Dolgun, Inal & Ugurlu, 2011*).

When present literature is analyzed (*Menezes et al., 2006; Sharma, 2005*) it was seen that the researches were generally carried out with school children and normal population. Especially at vocational training centers no researches about cigarette consume of the risk group adolescents between the ages of 16-18 were encountered. Adolescents working at vocational training centers are more at risk than other groups. In this study the aim was to show the abstract effects of smoking by applying the SOC Model to adolescents working at vocational training centers and smoking.

Material and Method

This study was conducted on adolescents who are still continuing their education at vocational training centers, aged 17±1. This study was planned to be both cross-sectional and experimental, and consisting of two-stages. In the 1st stage; Adolescent Risk-Taking-Questionnaire (ARTQ) was applied to 311 volunteer adolescents, who had education at the vocational training centre between the dates of the study. Individuals with communication obstacles and chronic health problems that effect the respiratory system were not included. According to the sub-scale result of risk-taking regarding substance use it was proceeded to the second stage. In the 2nd stage; the study was continued with 63 adolescents. Before starting with the research the ethics committee approval (19.07.2012/21871) was taken from the Istanbul University Istanbul Medical Faculty ethics committee. Additionally the parents of the volunteer adolescent participants were informed regarding the purpose of the study and a written consent were taken from them.

Data Collection Tool

Adolescent Identifying Form (AIF) was developed by researcher and expertise suggestions. This form consists of two sections, and there are questions to identify socio-demographic characteristics of adolescents in the 1st section, and to identify smoking status (SS) of adolescents in the 2nd section.

Adolescent Risk-Taking-Questionnaire (ARTQ) was developed by Gullone and Moore (2000), and the Turkish validity of the questionnaire was done by Kiran (2002). The ARTQ is a five point likert scale that demonstrates various risk-taking behaviors of adolescents. The individual evaluates himself through five categories between "1" Never Doing and "5" Always Doing. Individuals scoring above the average of the group score are considered as risk takers and individuals scoring below the group average are considered as less risk takers. The questionnaire consists of 15 articles of the sub-scale regarding Risk-Taking Respective to Social Status, 6 articles of the sub scale regarding Risk-Taking Respective to Issues in Traffic and 5 articles of the sub scale regarding Risk-Taking Respective to Substance Use. In order to determine the reliability of the scale Cronbach Alpha coefficient was used and for stability reliability the test-retest method.

It is reported that the alpha reliability factor of the whole of the scale was determined as 0.88 the alpha reliability factor regarding Risk-Taking Respective to Social Status was determined as 0.84, Risk-Taking Respective to Issues in Traffic was determined as 0.74 and Risk-Taking Respective to Substance Use was determined as 0.62. The reliability of the whole of the scale finding using the test-retest method was determined as 0.85, Risk-Taking Respective to Social Status was determined as 0.76, Risk-Taking Respective to Issues in Traffic was determined as 0.67 and Risk-Taking Respective to Substance Use was determined as 0.67. It is reported that the correlation between the similar scales developed with ARTQ is 0.87and the findings regarding the validity and reliability of ARTQ prove that the scale shall be used safely (*Gulgez & Kısac, 2014; Karahan et al., 2006*)

Expired- air Carbon monoxide (CO) Measure: The measurement of the CO in the expiration air is used for both to monitor the user during the process of quitting the habit of smoking and diagnosing various pulmonary diseases (*Velicer & Prochaska, 2004*). This method was preferred in our study due to its being non-invasive. The purpose for CO measure is to give the individuals solid feedback regarding their body and enable them to self asses themselves regarding the damage to their lungs due to CO gas and increase their motivation for quitting the habit of smoking. In our study a Micro-Smokerlyizer device (Bedfont Scientific Ltd. England) that measures the CO levels in expiration air calibrated and adjusted for adolescents was used to measure the CO level in the expiration air and CO Measuring Chart was used to evaluate the data from the device.

According to this chart; 1st group: 0-6 ppm non-smokers, 2nd group: 7-10 ppm danger zone, 3rd group: 11-15 ppm smoker, 4th group: 16-25 ppm frequent smoker, 5th group: 26-35 ppm addict, 6th group: 36-50 ppm seriously addicted, 7th group: 51-80 ppm dangerously addicted, individual. However there are a few individuals who do rarely smoke among the 0-6 ppm non smokers (1st group).

The Self Efficacy Scale: The original scale developed by Nicki and friends (1984) based on social learning theories and are related to the faith of an individual in acting accordingly with his will and is used in the process of quitting the habit of smoking (*Kamisli, 2007; Karatay 2007; Kennett, Morris & Bangs, 2005*). The Turkish reliability study of Self Efficacy Scale was done by Karanci (1992). The Cronbach Alpha of the scale was found between 0.72 and 0.84. It was used in some studies about smoking in our country (*Kamisli, 2007; Karatay, 2007*). Self Efficacy Scale consists of 25 articles and each article is scored between 1 to 5. The individual score of each article is evaluated among 5 different categories between "Not Sure At All 1" and "Definitely Sure 5". The total score range of the scale varies between 25-125 and the higher scores indicate the individual's greater faith in quitting the habit of smoking. Thus the higher scores on the scale are the greater the faith in quitting smoking becomes (*Kamisli, 2007; Karatay, 2007*).

The Stage of Change Evaluation: Stage of change according to the SOC Model was identified by using a short form. This instrument is composed of four questions, which evaluate the person's intention to quit smoking within a specific time interval, hence identifying the specific stage of change according to the SOC Model (Figure 1).

According to DiClemente and Prochaska (1985); as this questionnaire is not a psychological evaluation, no psychometric properties are reported in the literature. Nevertheless, stages of change have predicted quit smoking or relapse (*Chouinard & Ekstrand, 2005*). When analyzing movement to different stages of change, a score of 1 was given to adolescents who progressed to higher stages, while those who remained at the same stage, or relapsed to a previous stage, were given a score of 0.

The Application of the Research

Before starting the data collection process, pre-application was realized. In the pre-application phase**;** before collecting the research data, a pilot scheme application was carried out on 10 adolescents at the vocational training centre and these adolescents were excluded from the scope of the research. As a result, it was determined that the answer sentences of The Self Efficacy Scale "I'm not sure if I will smoke" and "I'm definitely sure that I won't smoke" were misunderstood and therefore the scale forms were reorganized in order to be understood by the adolescents from "I'm not sure if I will smoke" to "I will smoke" and "I'm definitely sure that I won't smoke" to "I will definitely not smoke".

Data Collection

1th phase: Before the research, the researcher has obtained the necessary permissions from the institutions, where the research will be carried out.

After having discussed with the managers of the vocational training centre, the adolescents were informed about the purpose, the methods and the content of the research. From the adolescents, who agreed to participate at the research voluntarily and from their families' oral permission were taken.

2nd phase: AIF and ARTQ were applied to the adolescents and due to the ARTQ's sub-scale results concerning substance use, the population of the research was determined.

3rd phase: In order to provide information to the research population on CO measurement, approximately 15 minutes individual preliminary discussions were held. From the families of the adolescents, who reported to attain the sessions of the research till to the end, written consent were obtained.

4th phase: By taking into account the days, when the adolescents came to the vocational training centre, groups were created. A general session was made with these groups. In this session the adolescents were informed that together with the general session eight sessions will be held, the CO levels will be measured in each session, that in the first session of smoking awareness intervention Self-efficacy test, Smoking State and The Stage of Change Form will be applied and in the last session in addition to these forms, ARTQ will be reapplied.

5th phase: Considering the days when the adolescents came to the vocational training centre, smoking awareness intervention program schedule with session days, hours and place information was created, in order not to hinder the education days. After the plenary session regarding the oncoming sessions was held, the adolescents were called one by one and CO measurement was carried out on the expiration air.

6th phase: On the adolescents who agreed to participate in the research, five smoking awareness interventions and two times supporting interventions were performed with one month and three months breaks. Smoking awareness interventions consisted of approximately 45-60 minutes group interviews and individual interviews ranging between 5-10 minutes. The smoking awareness intervention, consisting of five sessions was carried out in accordance with the prepared intervention plan and content in line with the researcher and expert views.

7th phase: In the last session ARTQ, Self-Efficacy Scale, Smoking State and The Stage of Change Evaluation Forms were applied again.

The application of the research is given in a flow chart in Figure 2.

Statistical Analysis

Parametrical tests were used to evaluate the data conform to normal distribution and non-parametrical tests were used to evaluate the data which are not conform to normal distribution. The evaluation of the data was done through Chi-Square Test, Student t Test, Kolmogorov-Smirnov Test, Friedman (K Related-Samples Test) Variance Analysis, Bonferroni Correction for Post-hoc Analysis, Wilcoxon Test-Two-Related Samples Analysis, Kendall Variance Analysis, Parametric One-Way Analysis of Variance Tests. $p < 0.05$ was considered statiscally significant.

Results

44.4% (n=28) of the adolescents included in the study were 17 years old and the average age was 17.07 ± 0.7 years, all the adolescents were male (n=63), 65.1% (n=41) have 3 or more siblings. All of the adolescents (n=63) admitted using harmful substances and 87.3% (n=55) admitted to smoke and again all of the adolescents (n=63) mentioned that their friends used harmful substances and 53.9% (n=34) of their friends smoked, 31.9% (n=20) used alcohol and 28.5% (n=18) used both alcohol and cigarettes.

It was determined that most of the adolescents (47.6%) have smoked between 1 and 3 years and one adolescent even more than 10 years. It was seen that 49.3% have started to smoke between 14-16 years. It was determined that the reasons for smoking were friends, stress and curiosity respectively (Table 1). It was also determined that the adolescents smoke mostly 11-20 cigarettes and 21-30 cigarettes per day. It was seen that 76.2% of the adolescents tried 1-2 times to quit smoking, but the most does not want to quit smoking. Furthermore it was determined that 14.2 % are indecisive in quitting and 9.6% are willing (Table 1).

When the CO level value distribution in the expiratory air, which was measured in the first session was analyzed; it was determined that most (58.7%) are in the 3rd group. During the sessions the number of adolescents of group 1 has increased and the number of adolescents of groups 2, 3 and 4 have decreased. There were no adolescent who are in the groups 5, 6 or 7 (Table 2).

During the sessions a decrease of CO level can be seen in Table 2. At the beginning (before intervention) the CO level was 12.00 ppm, in the 5th session it has decreased to 4.00 ppm, in the 6th and 7th session it stayed the same and in the 8th session it has decrease to 3.00 ppm. When the averages are taken into account especially in the transition between the 3rd and 4th session and between the 4th and 5th session are significant decreases. It was determined that the differences of CO levels during the sessions, which were realized by the statistical evaluation of Friedman (K Related-Samples Test) variance analysis are significant (F=243.916; $p<0.05$). Further it was determined that between the 1-2, 5-6, 5-7, 5-8 and 7-8 sessions, which was evaluated with the Bonferroni Correction for Post-hoc analysis were not statistically significant.

It was seen that the Self Efficacy averages (55.1±3.1) of the adolescents in the first session were lower than the Self Efficacy average (82.0±3.0) in the last session. The compared results between the Self Efficacy point averages in the first and last session are statistically significant (Wilcoxon Test -Two-Related Samples Analysis) ($p<0.05$).

It was seen that the Self Efficacy point averages of the adolescents who quit and reduce smoking (respectively; 97.1±4.7, 79.7±3.9) are higher than in the first session (respectively; 30.5±3.8, 62.2±3.7). It was determined that the Self Efficacy point average comparison of the ones who quit and reduce smoking in the last session are statistically significant ($p<0.05$), but the point average of the ones who continued to smoke at the same level (first session: 65.1±7.1, last session: 77.1±7.3) was not statistically significant ($p>0.05$).

According to the ARTQ results of the adolescents in the study group it was seen that the scale total point average was in comparison to the first session (54.0±1.3) lower in the last session (50.2±2.0). There was no significant decrease between the first and last session regarding risk-taking sub-scale values of the adolescents about social position and traffic, but there was a significant decrease in the risk-taking sub-scale values in relation to substance use. As in the comparison of the ARTQ values of the adolescents between the first and last session no statistical analysis result no significant difference was seen in the risk-taking values about social position and traffic, a significant value difference was seen in the risk-taking values in relation to substance use ($p<0.005$) (Table 3).

When the change stages distribution of the adolescents during sessions are analyzed (Table 4); it was determined that 76.2% of the adolescents were in precontemplation, 23.8% in contemplation and not in preparation, action or maintenance stage. As the sessions proceed it was seen that the adolescents change their places within the change stages. Although in the 7th and 8th session no awareness-rising intervention was applied, the adolescents did not relapse and after the 6th session the adolescents were in transition to the contemplation, preparation and action stages. In the evaluation during the 8th session, it was seen that 1.6% are in precontemplation, 11.1% in contemplation, 63.5% in preparation and 23.8% in action stage. In the statistical evaluation during the sessions it was confirmed that the difference, which the adolescents show in the change stages, are statistically significant ($p=0.001$; Friedman (K related sample test) variance analysis.)

Discussion

The findings, which we have obtained with this study, are showing that cigarette consume of the adolescents at risk can be decreased significantly regarding to the Stage of Changes Model.

The fact that adolescents live in a crowded family or with lots of siblings shall have an effect to their habits regarding health and attitudes in the society (*Oner et al., 2005*). 65.1% of the adolescents in our study had 3 or more siblings. This result is showing that the participants live with a lot of people together. It was determined that the adolescents in our study and their friends have used addictive drugs. It was seen that 87.3% of the adolescents smoke cigarettes, 53.9% of their friends smoked also, 31.9% drank alcohol and 28.5% smoke cigarette and drank alcohol together. Within the addictive drugs the most used substance were cigarettes like in the literature (*Oner et al., 2005*).

The adolescents at vocational training centers are exposed to lots of stress regarding their social life (working conditions, boss pressure, etc.). The smoking rate of these adolescents was higher in relation to the ones who receive formal education (*Ceylan & Metin, 2009*). Some researchers are stating that the beginning age of smoking in developing countries is changing between 12-16 years and the first smoking age is <10 (*Hamzacebi et al., 2008; Menezes et al., 2006; Palanci et al., 2009*). In our study it was also found that the beginning age of smoking is <10. It was determined that the adolescents, who begin smoking between 14-16 years are 49.3% (n=31) and are smoking for ≥10 years (Table 1).

These results emphasize the importance of giving education against cigarettes from first education on and continuing through the whole adolescent period (*Dogan & Ulukol, 2010; Gokgoz & Kocoglu, 2009*). In our study 41.3% of the adolescents were friends and 34.9% smoke due to stress. 81% of the adolescents have tried to quit for one or more times and 9.6% have mentioned that they are willing to quit smoking (Table 1). The fact that friends and stress are the reasons why adolescents are smoking, shows that the study is in accordance with literature (*Gokgoz & Kocoglu, 2009*). The results of our study regarding the ones, who tried to quit smoking are like the studies carried out before (*Telli et al., 2004*). But in our study the ones who want to quit smoking are less than in other studies. As reasons for that can be seen that the adolescents at vocational training centers have a different social environment and have insufficient information regarding the harms of smoking and try to show themselves as adults.

It is important to measure the CO levels of the individuals due to its being an abstract feedback and playing a motivation increasing role in quitting or reducing smoking (*Kamisli, 2007; Velicer & Prochaska, 2004; WHO, 1999*). In our study, the motivation of the adolescents has increased during the sessions. CO level have decreased in parallel with smoking. The decrease difference between the CO levels during sessions is significant ($p < 0.01$). In the analysis of the CO averages there was a significant decrease during the transition from the third to the forth session and from the fourth to the fifth session. (Table 2). This decrease can be related to the direct information transfer, to the CO level decrease, which the adolescents saw at the measurement devices, to the support of their friend and to the group and individual discussions. The CO level decrease shows that the sessions were effective but also that more studies are required regarding this topic. Furthermore it was seen that in the semester breaks the rates of smoking has decreased and adolescents even quit smoking. It can be thought that this was achieved because close friends of the adolescents influence and inspect them during school periods.

It is notified that in the studies during the stages of change process the behavioral and psychological needs of the individuals were taken into account and were used together with the Self Efficacy theory (*Kamisli, 2007; Reed et al., 2007*). The need of using motivating discussion techniques in consulting regarding substance use quitting and developing Self Efficacy was emphasized in the studies (*Ergul, 2005; Kamisli, 2007*). In the present study was seen that if the Self Efficacy point averages were evaluated of the adolescents at the first and last sessions, the obtained findings have changed and increased significantly ($p < 0.05$). Ergul, Aksayan and Gozum and Yesilbakan have mentioned that the individuals with high Self Efficacy need more effort and time to change a negative attitude than individuals with low Self Efficacy (*Ergul, 2005; Aksayan & Gozum, 1998; Yesilbakan, 2001*). Additionally they have emphasized that individuals with high Self Efficacy have a higher relapse risk. Accordingly more adolescents with low Self Efficacy at the first session have quit smoking at the last session. At the last session of the study there was no relapse. The studies with college students about smoking cessation (*Aksayan & Gozum, 1998; Yesilbakan, 2001*) have similarities regarding the Self Efficacy points in that study ($p < 0.05$). As a result it can be said that awareness-rising and supporting interventions increase Self Efficacy perception and have a positive effect on smoking cessation.

It was reported that risky behaviors should be evaluated in school with routine tests and as a result of this test for the groups at risk support and education programs are required (*Aksayan & Gozum, 1998; Aras et al., 2007*). Furthermore it was emphasized to arrange the curriculum with the aim to contain risk behaviors reducing activities (Sharma, 2005). In the provided study a decrease between the last and first session was determined regarding the ARTQ point averages. Especially the decrease between the last and first session regarding risk-taking sub-scale average in substance use is significant. A statistical meaningful difference was seen between the last and first session ($p < 0.01$) (Table 3). The decreases of substance use and risk-taking attitudes after the interventions applied to the adolescents are similar to literature (*Johnson et al., 2006; Sharma, 2005*).

The change stages of the individuals is a dynamic process and they can make transitions between the change stages (*Prochaska et al, 2004*). The transition between change stages are not linear but circular; this was shown in the studies as a result of monitoring the individuals who tried to quit smoking (*Dino et al., 2004; Johnson et al., 2006*). In the current study was seen that adolescents made transitions between the change stages. 23.8% of the adolescents in the study respond to the question "Are you still smoking?" at the end of the 8 session with "No". This result shows according to the SOC Model that adolescents pass from the precontemplation and contemplation stage to the action and after evaluating it in accordance with the SOC Model this result was found statistically significant ($p < 0.01$) (Table 4). The stage change of smoking individuals, which is deciding in smoking cessation is like in all studies (*Dino et al., 2004; Ergul, 2005*) similar in that study.

The change stages of the adolescents show a progress from the first to the last session. While in the first session nobody was in preparation stage, the adolescent rate in action stage at the last session was higher. These results are regarding the approach of smoking cessation satisfying findings. The cessation rate at the end of the sessions can also be evaluated as a reflection of that.

In line with the results obtained from the study; it was seen that the application carried out was effective on smoking cessation. Another point to mention is the importance of education for the adolescents, who have not sufficient knowledge regarding addiction. The received education should increase the life quality of adolescents and be awareness-rising and psycho-social abilities developing oriented. Awareness-rising of adolescents regarding the effects of harmful substances, education, coping skills, avoiding repetitions, guidance and providing family cooperation constitute a significant part of the healthcare professionals' responsibilities. Especially adolescents working in the industry region are more risky regarding substance use due to their professions and age and therefore they must receive more consult and support. Interventions must be carried out in order to provide consulting and support services and develop the Self Efficacy of adolescents at vocational training centers.

Acknowledgments

Conflict of Interest

The authors declare that there is no conflict of interest for this study.

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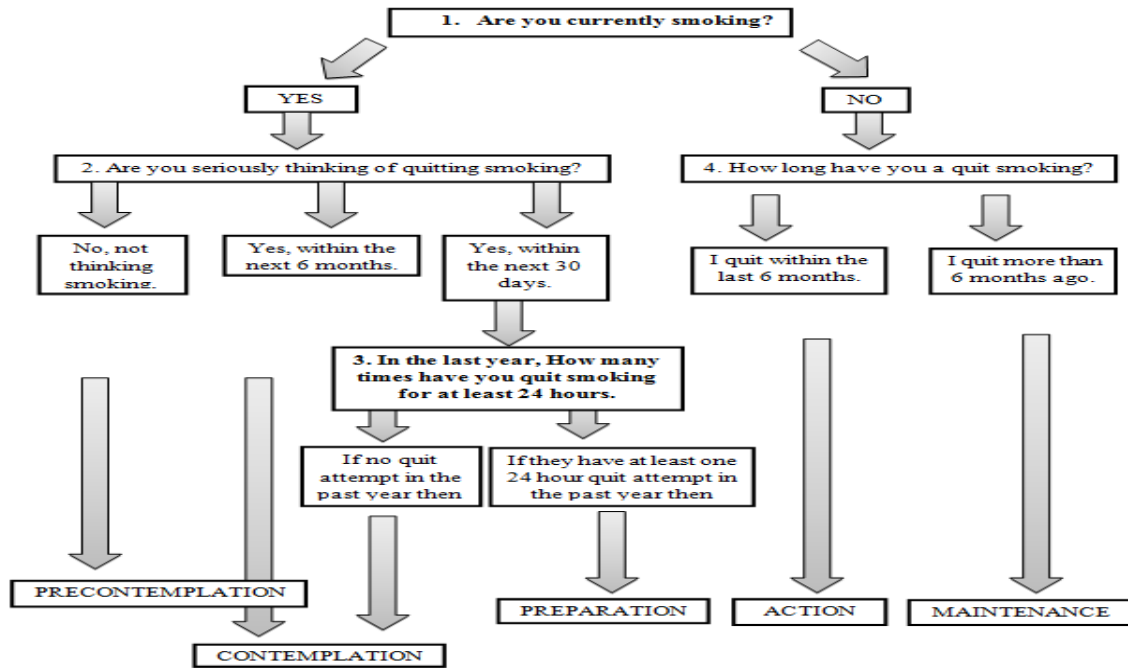**Figure 1: Interpretation Algorithm of the Smoking Behavior Stages of Change Scale.[27]**
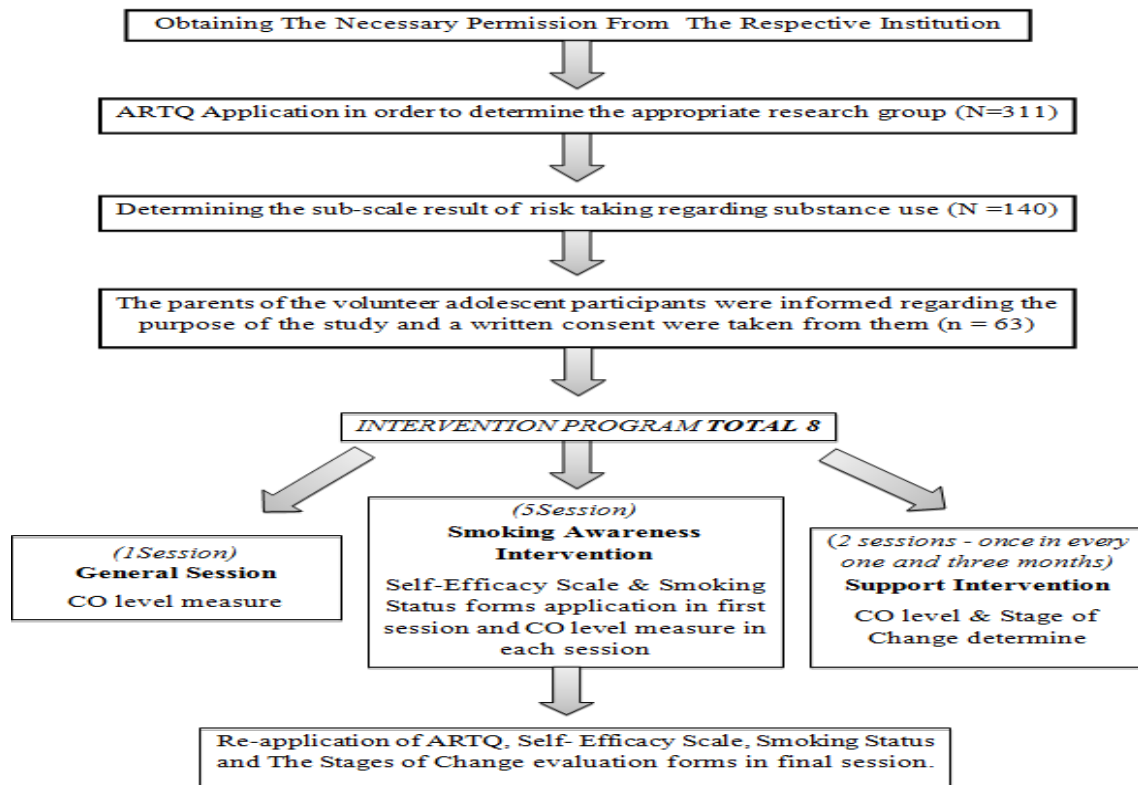

Figure 2. Flow Chart of the Study

Table 1. Evaluation of the Smoking Statuses in Adolescents (N = 63)

Features of smoking	n	%
The duration of smoking (year)		
1-3	30	47.6
4-6	24	38.1
7-9	8	12.7
≥10	1	1.6
The age of starting smoking (year)		
≤ 10	6	9.6
11-13	24	38.1
14-16	31	49.3
≥17	2	3.0
The reason of smoking		
friend	26	41.3
stress	22	34.9
wannabe	3	4.8
curiosity	10	15.9
desire to fit into a social group	2	3.2
The avarage number of cigarettes smoked per day (unit)		
≤10	10	15.9
11-20	27	42.9
21-30	26	41.3
≥31	-	-
First smoking time of day		
In the first five minutes after waking	10	15.9
6-30 min.	18	28.6
31-60 min.	6	9.5
≥1-2 hours	24	38.1
Other	5	7.9
Previously attempted to quit smoking		
Any attempt didn't	12	19.0
1-2 times	48	76.2
≥3	3	4.8
The status of wanted to quit smoking		
I don't want	48	76.2
indecisive	9	14.2
I want	6	9.6

Table 2. Comparison of Expired-Air CO Measurement Value in Adolescents During Sessions. Table is Composed According to CO Measurement Chart (N=63)

	Groups according to CO measurement chart				CO measurement value (ppm) *F=243.916, p<0.01			
Sessions	*non-smoker (0-6ppm)*	*Danger zone (7-10ppm)*	*smokers (11-15ppm)*	*frequent smoker (16-25ppm)*	Min	Max.	Med.	$\overline{x} \pm$ SD
	n (%)	n (%)	n (%)	n (%)				
1.	-	19 (30.2)	37 (58.7)	7 (11.1)	7.00	20.00	12.00	11.9 ± 0.3
2.	1 (1.6)	29 (46.0)	27 (42.9)	6 (9.5)	6.00	22.00	11.00	11.3 ± 0.4
3.	9 (14.3)	29 (46.0)	24 (38.1)	5 (1.6)	5.00	16.00	10.00	9.5 ± 0.3
4.	30 (47.6)	28 (44.4)	5 (7.9)	-	1.00	13.00	7.00	6.7 ± 0.3
5.	45 (71.4)	14 (22.2)	3 (4.8)	1 (1.6)	0.00	19.00	4.00	5.4 ± 0.4
6.	44 (69.8)	13 (20.6)	5 (7.9)	1 (1.6)	0.00	16.00	4.00	5.1 ± 0.4
7.	44 (69.8)	14 (22.2)	4 (6.3)	1 (1.6)	0.00	18.00	4.00	4.9 ± 0.5
8.	45 (71.4)	14 (22.2)	3 (4.8)	1 (1.6)	0.00	16.00	3.00	4.2 ± 0.4

Notes. Values are given either as % or arithmetic average ($\overline{x}$) ± standard deviation (SD). *Friedman (K related sample test) variance analysis

Table 3. Comparison between First and Final Session. Adolescent Risk-Takin Questionnaire (ARTQ) Points in Adolescents (N = 63)

ARTQ	First Session		Final Session		
	Median	$\overline{x} \pm$ SD	Median	$\overline{x} \pm$ SD	*p value
ARTQ Total	52.00	54.0±1.3	47.00	50.2±2.0	*0.054*
risk-taking respective to social status	30.00	31.9±1.0	29.00	30.1±1.4	*0.378*
risk-taking respective to issues in traffic	11.00	11.3±4.0	10.00	11.3±0.4	*0.801*
risk-taking respective to substance use	10.00	10.7±1.9	8.00	8.6±0.3	*0.001**

Notes. Values are given either as % or arithmetic average ($\overline{x}$) ± standard deviation (SD). *Wilcoxon test-two-related samples analysis. **p<0.01

Table 4: During Sessions, Distribution of the Stages of Change in Adolescents(N=63)

| Sessions | The Stages of Change $*F = 316.571, \quad p < 0.01$ | | | |
| | Precontemplation | Contemplation | Preparation | Action |
	n (%)	n (%)	n (%)	n (%)
1.	48 (76.2)	15 (23.8)	-	-
2.	45 (71.4)	13 (20.6)	5 (7.9)	-
3.	28 (44.4)	28 (44.4)	5 (7.9)	2 (3.2)
4.	12 (19.0)	41 (65.1)	4 (6.3)	6 (9.5)
5.	5 (7.9)	19 (30.2)	29 (46.0)	10 (15.9)
6.	4 (6.3)	14 (22.2)	32 (50.8)	13 (20.6)
7.	1 (1.6)	9 (14.3)	38 (60.3)	15 (23.8)
8.	1 (1.6)	7 (11.1)	40 (63.5)	15 (23.8)

Note. *Friedman (K related sample test) variance analysis.