ARAŞTIRMA / RESEARCH

Effect of acceptance and commitment-based counselling on smoking cessation and quality of life

Kabul ve kararlılık temelli danışmanlığın sigara bırakma ve yaşam kalitesi üzerindeki etkisi

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Abstract

Purpose: This study was conducted to examine the effect of acceptance and commitment-based counseling on smoking cessation and quality of life in Turkish society.

Materials and Methods: The study was conducted as a randomized controlled trial with experimental design with 35 individuals including 17 in the intervention group and 18 in the control group. The data of the study were collected using the Personal Information Form, SF-36 Quality of life Questionnaire, and Fagerstrom Test for Nicotine Dependence (FTND). 6 sessions of acceptance and commitment-based counseling was given to the intervention group including 1 session per week for 6 weeks.

Results: The intervention and control groups had similar demographic characteristics. It was determined that there was a significant decrease in the mean number of cigarettes a day and FTND intervention follow-up measurement mean scores after the intervention and in the follow-up measurements in the intervention group and this decrease was significantly lower than the mean number of cigarettes per day by the participants in the control group. In the intragroup evaluation of SF-36 Quality of Life subscale scores of the intervention group, significant score increases were observed in all subscales other than physical role functioning, pain, and emotional role functioning.

Conclusion: Acceptance and commitment-based counseling was found to be effective in smoking cessation and quality of life in Turkish society. This study provide useful evidence-based information for healthcare professionals in the nursing practice.

Keywords:. Acceptance and commitment, counseling, quality of life, smoking cessation

Öz

Amaç: Bu araştırma, kabul ve kararlılık temelli danışmanlığın Türk toplumunda sigara bıraktırma ve yaşam kalitesi üzerine etkisini incelemek amacıyla yapılmıştır.

Gereç ve Yöntem: Araştırma randomize kontrollü deneysel desenli bir çalışma olarak; 17 müdahale, 18 kontrol grubunda olmak üzere 35 birey ile yürütülmüştür. Araştırma verileri Kişisel Bilgi Formu, SF-36 Yaşam Kalitesi Ölçeği, Fagerström Nikotin Bağımlılığı Ölçeği (FNBÖ) kullanılarak toplanmıştır. Müdahale grubuna 6 hafta, haftada 1 seans olmak üzere 6 seans kabul ve kararlılık temelli danışmanlık verilmiştir.

Bulgular: Müdahale ve kontrol grubu benzer demografik özelliklere sahiptir. Müdahale grubunda günde içilen sigara sayılarının müdahale sonrası ve izlem ölçümündeki sayı ortalamalarında anlamlı düşüş olduğu ve bu düşüşün kontrol grubundaki katılımcıların günde içilen sigara sayı ortalamalarından anlamlı oranda düşük olduğu belirlenmiştir. SF-36 Yaşam Kalitesi alt ölçek puanlarının müdahale grup içi değerlendirmesinde; fiziksel rol fonksiyon, ağrı ve emosyonel rol fonksiyon dışındaki bütün alt boyutlarda anlamlı puan artışlarının olduğu görülmüştür.

Sonuç: Kabul ve kararlılık temelli danışmanlığın Türk toplumunda sigara bıraktırma ve yaşam kalitesi üzerine etkili olduğu belirlenmiştir. Bu çalışma, hemşirelik uygulamalarında sağlık uzmanları için faydalı kanıta dayalı bilgiler sağlamaktadır.

Anahtar kelimeler: Kabul ve kararlılık, danışmanlık, yaşam kalitesi, sigara bırakma

INTRODUCTION

Tobacco use causes many health problems and is ranked as among the preventable disease and death causes[1,2]. Besides, it is known that it is directly and closely related to fatal and non fatal chronic diseases[3,4] and the cause for one of every 10 death worldwide[1].

Physiological changes and physical and mental diseases due to smoking bring a significant financial burden[3,5]. Numerous studies have emphasized that smoking is closely associated with the quality of life of individuals due to the financial losses and health problems and smokers have an impaired quality of life[6,7]. Quality of life defines the individual's perceiving subjectively his/her health under the global health conditions such as activities of daily life, disorders or handicaps in the socio-cultural environment where the individual lives[6]. Smoking is a condition that negatively affects this perception and non-smoking, quitting and continuing this process after cessation are important parameters for quality of life[8]. Therefore, it is very important to increase motivation for smoking cessation, prevent to start smoking again and understand how the quality of life is affected after cessation[6].

Smoking can be successfully quit with components primarily such as therapeutic training, behavior support, and medication administration[9]. Approaches providing behavior support within these components have been used for many years and are known to have an important role in smoking cessation[10]. Cognitive-behavioral approaches and motivational interview techniques can be regarded among these approaches[11,12]. One of the approaches that provide behavior support is acceptance and commitment-based interventions[13]. Acceptance and commitment-based interventions also involve the recognition of negative thoughts and emotions arising during smoking cessation. Unlike other cognitive behavioral methods, they focus on the adoption of these challenging thoughts by the individual rather than struggling with them and shaping the behavior following the values[13,14]. The psychopathology model of acceptance and commitment-based interventions emphasizes the need to reduce the preponderance of the conceptual past and future, dysfunctional behaviors, attachment to the theoretical self, cognitive fusion and experiential avoidance and increase the bond with values[13].

Although in the literature many studies have been conducted on smoking cessation with acceptance and commitment-based approaches[15,16], there is no study on this issue in Turkey. In this respect, its application to different cultures is believed to provide evidence for the field. In addition, nurses working with addicted individuals carry out functions such as explaining addiction to these individuals, working on denial, developing effective coping strategies, anxiety management, activating support systems, facilitating the expression of feelings, counseling and training. In this direction, it is thought that acceptance and commitment-based interventions will guide nurses in understanding the denial mechanisms of the individual, enabling them to cope effectively and managing their anxiety. However, no study was found investigating the effect of acceptance and commitment-based approaches on quality of life subscales and smoking cessation together. Clients who learn the basic philosophy of interventions made with acceptance and commitment-based approaches will be able to apply these applications to every area of their lives. Therefore, this study was conducted to determine the effect of acceptance and commitment-based interventions to be made for the smokers on smoking cessation and quality of life skill levels. Also, this study aims is to demonstrate the effectiveness of metaphors and exercises used in acceptance and commitment-based interventions in different cultures.

This study was a randomised controlled experimental trial to determine the effect of acceptance and commitment-based counselling on the quality of life and smoking cessation. In the study, answers were sought to three hypotheses regarding the relationships between independent variables. The first, acceptance and commitment-based intervention in smokers increases smoking cessation rates. The second, acceptance and commitment-based intervention in smokers reduces nicotine addiction scores. As the third, acceptance and commitment-based intervention in smokers increases their quality of life scores.

MATERIALS AND METHODS

Erciyes University Clinical Research Ethics Committee (Approval Date: 17.03.2017; Approval Number: 2017/152) approval was obtained for compliance with scientific ethics. Also, permissions from Smoking Cessation Outpatient Clinic of the Department of Chest Diseases of Erciyes University

Medical Faculty Hospital were obtained to conduct the study. Written and oral informed consent was obtained from the individuals in the intervention and control groups who agreed to participate in the study.

Sample size

The sample of the study was calculated by using power analysis. For the sample size; the power of the study was calculated in GPower3.1. program. The study of Gifford VG. named as "Acceptance-Based Treatment for Smoking Cessation" was taken as the reference as the study had a similar test design[14].

Accordingly, The sample size was calculated as a total of 38 individuals including 19 individuals in each of intervention and control groups. As a result of excluding the individuals who did not attend the sessions and withdrew from the study by his/her will among the individuals who agreed to participate in the study, a total of 35 individuals (17 individuals in the intervention group and 18 individuals in the control group) were included, the post-hoc power analysis was conducted and it was completed with a power rate of 87%. Age, gender, education levels and FTND were determined as matching criteria(Figure 1).
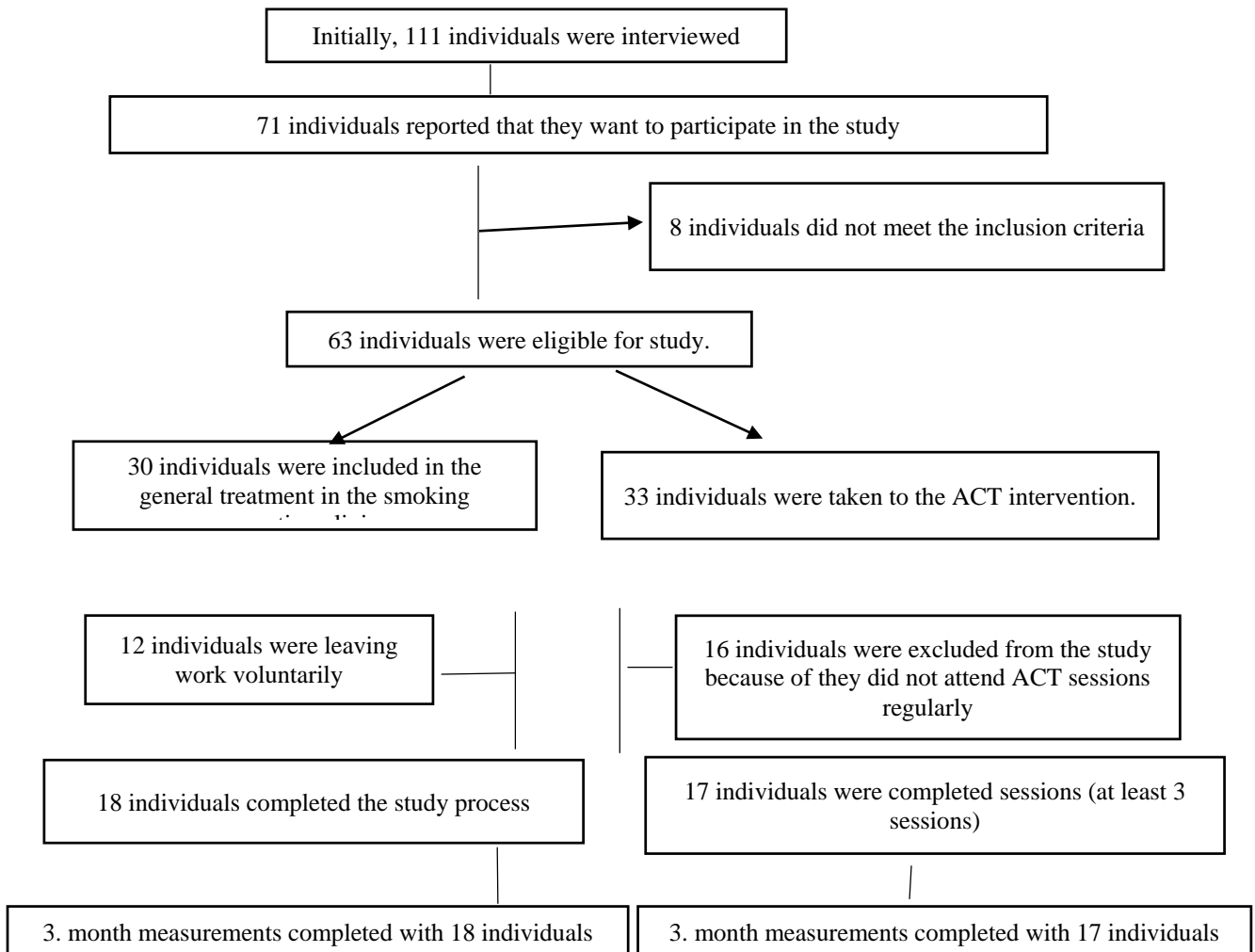

Figure 1. Diagram of the screening, eligibility, allocation and follow-up of study participants

Individuals who received 5 or higher scores from Fagerstrom Test For Nicotine Dependence, smoked 10 or more cigarette per day for 12 months or identified themselves as nicotine addicted were included in the study. Participants agreed to be assigned to random counseling and reported not to use other methods to quit smoking during the 6-week counseling period. Individuals who received were 18 years old and over, were literate, had adequate communication skills, had no disorder that may reduce comprehension and understanding ability were included in the study. The termination criteria of the study were determined as not attending three or more counseling sessions, having various health problems that may affect the participation to the study or showing excessive withdrawal symptoms associated with smoking cessation during the study.

Grouping

Participants were randomly assigned to the intervention and control groups according to these criteria. To provide randomization of the individuals included in the study, the patient numbers to be taken by the non-return methods were given to the groups with the help of a macro written in MS Excel program. During the study period, all individuals who have applied to the smoking cessation outpatient clinic have been interviewed. After these interviews, eight individuals have not been included in the study because they have not met the study criteria. Individuals have been assigned to the intervention and control groups according to randomization criteria. Twelve individuals from the intervention group have wanted to leave the study and sixteen individuals from the control group have been excluded because they have not completed the intervention sessions. The study has been completed with eighteen individuals in the control group and seventeen individuals in the intervention group.

Measures

Data were collected from 21.07.2017 to 15.01.2018. In the collection of the data, the Personal Information Form, SF-36 Quality of Life Questionnaire, and Fagerstrom Test For Nicotine Dependence (FTND) prepared by the researchers were used.

Personal Information Form

Personal Information Form was prepared by the research upon the literature review. Personal

Information Form was composed of 19 questions about sociodemographic characteristics, smoking and addiction status[14].

SF-36 Quality of Life Questionnaire

SF-36 is a general scale that is adapted from "Medical Outcomes Study" and measures quality of life. The validity and reliability study of the Turkish version of SF-36 was conducted by Koçyiğit et al., (1999)[17]. The SF-36 questionnaire consists of 36 items that provide the measurement of eight subscales of quality of life. These subscales are physical functioning, social functioning, role limitations due to physical functioning, role limitations due to emotional problems, mental health, energy/vitality, pain and the general perception of health. In the reliability studies, Cronbach's alpha coefficients of each subscale were calculated separately and found between 0.73 and 0.76[18]. In the present study, the Cronbach's alpha coefficients of each subscale of SF-36 Quality of life were determined between 0.50 and 0.88.

Fagerstrom Test for Nicotine Dependence (FTND)

FTND was developed by Heathorn et al., (1991) and is composed of 6 questions[19]. Each question has specific scores depending on the answer. The scores obtained as a result of the test are classified as follows: 1) Low (0 - 4 points); 2) Medium (5 -6 points); 3) High (7 - 8 points) and 4) Very high (9 - 10 points). Turkish validity and reliability study of FTND were conducted by Uysal et al., (2004)[20]. Turkish version of FTND was reported to have medium level reliability and its Cronbach's alpha coefficient was 0.56. In this study, Cronbach's alpha coefficient of FTND was found as 0.731.

Procedure

Pre-interventions for the study

After obtaining the application permission of the study, a preliminary application was conducted with 4 smoking individuals to test the functionality of Personal Information Form and determine the most common problems experienced by the patients. After the preliminary application, "think your previous smoking cessation attempts and write your restarting reasons", the 18th question in the Personal Information Form, was perceived as a reason for quitting by the participants and omitting this question from the questionnaire was considered appropriate. To clarify the smoking cessation statuses of the

individuals, the questions of "did you quit smoking?" and "when did you quit?" were added into the Personal Information Form and the form was put into final form. Also, the necessary adjustments were made in the is acceptance and commitment-based intervention study protocol. The "metaphor of the monsters on the ship", which was used in the acceptance session which is the third session was changed with the metaphor of "passengers on the bus" since it was observed that the individuals had difficulties in interpretation and imagination. Individuals included in the preliminary application were not included in the intervention group.

Interventions for the control group

FTND was applied to the individuals and individuals who met the inclusion criteria were included in the control group according to randomization. The participants were interviewed and informed about the study and their informed consent forms were taken. The individuals were not informed about their assignment to the intervention and control groups. Data collection forms were applied by the researcher during the first interview conducted with the individuals, which took averagely 25-30 minutes. According to the status of the individual, nicotine replacement treatment or medication treatment from the routine treatments of Smoking Cessation Outpatient Clinic was given. the individuals filled out the data collection form again at the end of the study and 3 months later. Follow-up measurements were made by telephone.

Interventions for the intervention group

The researcher applied for the is acceptance and commitment-based counseling program, lasting averagely for 30-60 minutes, individually to the individuals in the intervention group once a week for 6 weeks determined after the preliminary application. Prepared study protocol, were sent to the Association Contextual Behavioral Sciences representing the is acceptance and commitment-based intervention approach in Turkey, to get his permission. The researcher applied the data collection forms again to the individuals in the intervention group before, right after, and 3 months after the counseling program. While 3rd-month measurements were performed to those coming in the smoking cessation outpatient clinic, these measurements were carried out by telephone for those who could not come to the outpatient clinic.

Stages of the interventions applied to the intervention group

The client was informed about the following rules and when he/she could not understand any part, this part was explained to him/her.

In general, session structuring was designed as a) review of the previous session b) mindfulness c) basic intervention and d) homework. Table 1. shows the study protocol that is composed of a total of six sessions.

Table 1. Content of the study protocol applied to the intervention group

Session name/number	Purpose	Interventions
Values (1st Session)	To establish an effective bond with the client and to gain his/her trust. To give information about the interventions and sessions to be made. To clarify what gives the meaning and purpose of our lives and to use our values as a guide to our behaviours.	Introduction and general information were made. Breathing exercise and compass metaphor were applied. He/she was asked to fill the chart of values and objectives, to realise the moments when he/she acted in accordance with his/her own values and to record what it was like to act like that.
Separation (2nd Session)	To help the individual to realise his/her thoughts and to allow those thought to pass through his/her minds without going through them by opening the distance between his/her thoughts.	The previous session was reviewed. Breathing exercise and "leaves on a stream" metaphor were performed. The client was asked to this exercise and metaphor until the next session when he/she had thoughts about smoking. If

		he/she could not do, he/she was asked to realise and record the thoughts, feeling and situations causing this situation.
Acceptance (3rd Session)	To allow experiencing distressing individual experiences if they allow us to act in line with our values. To be open to undesirable individual experiences. To establish an in-depth psychological relationship without defending against undesirable experiences.	The previous session was reviewed. By summarising the second session, feedback was received from the clients regarding the required homework. Breathing exercise and "passengers on a bus" metaphor were applied. The client was asked to realise the time he/she struggles with the feelings about smoking until the next session and to apply the exercise he/she learnt in this session when he/she noticed. In addition, the importance of recording the number of thoughts and feelings about smoking, whether or not he/she applied the exercise and metaphors, and reasons if he/she did not were emphasised to be recorded until the next session.
Pure Awareness (4th Session)	To provide a safe and stable point of view to observe and accept thoughts and feelings, independently of them. To establish a bond with a vast sense of self through thoughts and emotions. To help people to experience that there is an area inside people where their sufferings cannot hurt them no matter how big they are. As a result, to help them to stop avoid the sufferings.	The previous session was reviewed. Feedback regarding homework was received from clients. The effectiveness and applicability of the counselling given for smoking cessation were asked to the client and discussed. Breathing exercise and "sky" metaphor were applied. It was emphasised that the breathing exercise and sky metaphor taught in this session should be done at an appropriate time once a day by the client until the next session. In addition, while doing this exercise, it was recommended to pay attention to whoever noticed these differences sometimes. Until next session, he/she was asked to record the difficulties he/she experienced while applying the exercise and metaphor.
Understand Contact (5th Session)	To raise conscious awareness about our instant experiences. To understand truly what important information is about changing or maintaining the behaviour by gathering these information. To connect as a whole to whatever we are doing in order to provide satisfaction and to be more effective in our work.	The previous session was reviewed. A summary of the previous session was made and the homework was checked. In general, the usefulness of smoking cessation and sessions are talked. Breathing exercise and "time machine" metaphor was applied. It was emphasised that the client should apply the exercise and metaphors he/she learnt in this and previous sessions especially when he/she found him/herself lost with the thoughts and feelings about smoking for whole day until the next session.
Move on (6th Session)	To transform values into continuous and evolving actions. To reestablish the relationship with the values whenever we lose a relationship with our actions towards values.	The previous session was reviewed. The contents of the counselling sessions from the beginning to the present were summarised briefly. Since this session was the last session, it was reminded that the scales would be applied again at the end of the session. The breathing exercise and rating of daily activities were taught. No homework was given since this was the last session.

Statistical analysis

The data obtained in the study were evaluated in the computer environment. Shapiro-Wilk test was used to evaluate whether or not the data were normally distributed. Descriptive statistical methods (mean, standard deviation, frequency) were used to assess the data of the study. In the study, chi-square test was applied to determine whether intervention and control groups showed similar characteristics according to matching criteria. Besides, chi-square test was used to compare smoking cessation rates in the intervention and control groups. Firedman test was applied to determine whether there was any change in the pre, post and follow-up measurement scores of the groups. In order to determine whether there is a difference between intervention and control groups in terms of quality of life and FTND scores, Mann Whitney U test was used. Significance was evaluated at $p < 0.05$ level.

Table 2. Comparison of the individuals in the intervention and control groups in terms of several variables.

Demographic Variables		Intervention Group (n=17)		Control Group (n=18)		P*
		n	*%*	*n*	*%*	
Gender						
	Female	7	41.2	8	44.4	X²=0.038
	Male	10	58.8	10	55.6	P=0.845
Chronic Illness						
	Yes	4	23.5	6	33.3	X²=0.412
	No	13	76.5	12	66.7	P=0.521
Age						
	18-29	8	47.1	6	33.3	
	30-39	2	11.8	6	33.3	X²=2.402
	40-49	4	23.5	3	16.7	P=0.552
	50-59	3	17.6	3	16.7	
Marital status						
	The married	8	47.1	9	50.0	X²=0.431
	Single	8	47.1	7	38.9	
	Divorced	1	5.8	2	11.1	P=0.806
People with whom they live						
	With his wife	1	5.9	1	5.6	
	With his wife and children	7	41.2	8	44.4	
	With his children	1	5.9	4	22.2	X²=2.658
	Other	8	47.0	5	27.8	P=0.715
Education Level						
	Primary school	1	5.9	1	5.6	
	Secondary school	1	5.9	1	5.6	X²=0.038
	High school	8	47.1	8	44.4	P=0.998
	University	7	41.1	8	44.4	
Job						
	Worker	1	5.9	3	16.6	
	Officer	7	41.2	6	33.3	
	Independent	1	5.9	2	11.1	X²=7.188
	Retired	2	11.8	1	5.6	P=0.336
	Housewife	1	5.9	4	22.2	
	Unemployed	0	0.0	1	5.6	
	Student	5	29.3	1	5.6	
Income status						
	Less than expenses Income	3	17.6	7	38.9	X²=3.545
	Income is equal to expenses	11	64.8	6	33.3	P=0.189
	More than expenses income	3	17.6	5	27.8	
FTND before intervention		4.529±2.477		5.444±2.357		P=0.237

Ki-kare; p≤.05 is statistically significant, FTND; Fagerström Test for Nicotine Dependence

RESULTS

Demographic variables of the individuals in the intervention and control groups were given in the Table 2.

As seen in Table 3., all of the participants in the intervention and control groups were smoking before the counseling. It was observed that 58.8% of the individuals in the intervention group quit smoking after the counseling application and their cessation happened during the counseling process. It was observed that the rate of individuals quit smoking in the intervention group decreased to 41.2 % during the 3rd-month measurements

On the other hand, the rate of individuals who quit smoking in the control group after the counseling was 16.7% and 11.1% of these individuals quit smoking during counseling and 5.6% quit smoking after the counseling. These rates did not change in the 3rd-month measurements.

Table 3. Comparison of smoking cessation statuses of the intervention and control groups before, after and 3 months after the application

Smoking Cessation Status		Intervention Group (n=17)		Control Group (n=18)		P*
		n	%	n	%	
Pre-intervention	Non-Smoker	0	0.0	0	0.0	X²=-
	Smoker	17	100.0	18	100.0	P=1.000
After intervention	Non-Smoker	10	58.8	3	16.7	X²=4.972
	Smoker	7	41.2	15	83.3	P=0.026
3 months after intervention	Non-Smoker	7	41.2	3	16.7	X²=2.500
	Smoker	10	58.8	15	83.3	P=0.114

Ki-kare; *p<0.05 is statistically significant.

Table 4. Comparison of the number of cigarettes smoked a day and FTND scores of the intervention and control groups before, after and 3 months after the application.

FTND points total	Intervention Group (n=17)	Control Group (n=18)	z	P*
	M±SD (Median)	±SD (Median)		
Pre-intervention	4.529±2.477^a (4.0)	5.444±2.357^a (6.0)	-1.183	0.237
After intervention	2.235±2.437^b (2.0)	3.277±2.562^b (3.0)	-1.246	0.213
3 months after intervention	1.588±1.938^b (0.0)	3.944±2.858^{ab}(4.5)	-2.566	0.010
P**	0.001	0.044		

(a,b: Superscript indicate differences within the group. There is no difference in the measurements with the same letters).
* Mann-Whitney U Test (p <0.05 and p <0.01 significant)
** Friedman test (p <0.05 and p <0.01 is significant)

In Table 4, the number of cigarettes smoked per day of the intervention and control groups before and after the counseling program and the comparison of Fagerström nicotine addiction scale scores have been given. It was observed that there was no statistically significant difference between FTND scores of the individuals before and after the application of the counseling program ($p>0.05$). However, in the 3rd-month measurements after the counseling, FTND scores of the intervention group were lower than those of the control group and this decrease was statistically significant ($p<0.05$). FTND scores of the intervention group decreased after the application compared to those before the application and this decrease continued in the follow-up measurements ($p<0.05$). On the other hand, there was a statistically significant difference between the pre-application and post-application FTND scores of the control group ($p<0.05$), but the score difference in the follow-up measurements was not statistically significant ($p>0.05$).

Table 5. Comparison of SF-36 Quality of Life Subscale Scores of the intervention and control groups before, after and 3 months after the application

Quality of Life Subscales	Intervention Group (n=17)	Control Group (n=18)	z	P*
	M±SD (Median)	M±SD (Median)		
Physical Function				
Pre-intervention	75.000±15.811(80.0)a	72.500±20.164(80.0)	-0.149	0.881
After intervention	82.941±14.476(90.0)ab	79.722±17.018(85.0)	-0.500	0.617
3 months after intervention	86.764±14.571(90.0)b	82.222±18.725(85.0)	-0.655	0.512
P**	0.001	0.197		
Physical Role Function				
Pre-intervention	89.705±25.091(100.0)	62.500±39.528(75.0)	-2.428	0.015
After intervention	83.823±26.429(100.0)	72.222±37.267(87.5)	-0.975	0.330
3 months after intervention	94.117±14.057(100.0)	69.444±37.919(87.5)	-2.209	0.027
P**	0.472	0.387		
Pain				
Pre-intervention	64.117±19.703(70.0)	66.111±22.787(70.0)	-0.502	0.616
After intervention	63.529±14.975(70.0)	65.000±28.336(75.0)	-0.655	0.513
3 months after intervention	71.764±19.440(70.0)	68.333±27.493(80.0)	-0.069	0.945
P**	0.150	0.862		
General Health				
Pre-intervention	49.411±16.852(45.0)a	53.611±19.159(52.5)	-0.531	0.595
After intervention	60.294±18.830(65.0)b	58.333±19.097(55.0)	-0.315	0.753
3 months after intervention	57.352±16.781(55.0)b	54.166±23.655(50.0)	-0.448	0.654
P**	0.001	0.422		
Social Function				
Pre-intervention	66.911±23.360(62.5)a	65.972±21.779(62.5)	0.000	1.000
After intervention	78.676±19.647(87.5)b	61.805±22.877(56.2)	-2.193	0.028
3 months after intervention	74.264±19.500(75.0)ab	68.750±28.196(75.0)	-0.337	0.736
P**	0.049	0.516		
Emotional Role Function				
Pre-intervention	60.784±24.253(66.6)	48.148±36.554(66.6)	-0.958	0.338
After intervention	60.784±31.700(66.6)	44.444±37.919(33.3)	-1.372	0.170
3 months after intervention	60.784±35.814(66.6)	62.963±34.087(66.6)	-0.172	0.863
P**	0.941	0.590		
Mental Health				
Pre-intervention	53.882±21.868(52.0)a	59.333±16.363(60.0)	-0.847	0.397
After intervention	67.294±16.077(68.0)b	57.555±15.591(56.0)	-1.771	0.077
3 months after intervention	65.882±17.269(64.0)b	62.000±19.511(68.0)	-0.249	0.803
P**	0.031	0.753		
Energy				
Pre-intervention	47.941±17.858(45.0)a	54.444±17.977(60.0)	-1.111	0.266
After intervention	60.588±15.091(60.0)b	52.500±15.267(55.0)	-1.627	0.104
3 months after intervention	59.411±16.093(55.0)ab	55.000±21.625(60.0)	-0.464	0.642
P**	0.004	0.828		

(a,b: Superscript indicate differences within the group. There is no difference in the measurements with the same letters).
* Mann-Whitney U Test (p <0.05 and p <0.01 significant.; ** Friedman test (p <0.05 and p <0.01 is significant.

Table 5.. shows the comparison of the SF-36 Quality of Life Subscale Scores of the intervention and control groups before, after and 3 months after the application. While it is observed that there was no statistically significant difference between the physical role functioning subscale scores of intervention and control groups in the post-application measurements ($p>0.05$), there was a

statistically significant difference in favor of the intervention group in the measurements made before the application and 3 months after the application ($p<0.05$). While there was no statistically significant difference between the social functioning subscale scores of the intervention and control groups before the application, the scores of the intervention group were higher than the control group after the application ($p<0.05$).

It was determined that the scores of the control group from all subscales of SF-36 Quality of Life Questionnaire did not show any difference in the measurements made before and after the application ($p>0.05$).

When the intervention group was examined, it was observed that the scores of physical functioning, general health, social functioning, mental health, and energy subscales showed a difference after the application compared to those before the application and the difference was statistically significant ($p<0.05$). The post-hoc test applied to determine which measurement caused the intragroup difference revealed that the difference was caused by pre-application, post-application and the 3rd-month follow-up mean scores. The increase in scale scores indicates that the quality of life is positively affected. It shows a more significant improvement in the quality of life of individuals in the intervention group.

DISCUSSION

After the application, more than half of the individuals in the intervention group quit smoking, this rate is close to half although it decreases slightly in follow-up measurements. This ratio is approximately 1/5 in the control group, it is seen that this situation does not change in follow-up measurements. It was observed that the acceptance and commitment-based intervention had a statistically significant effect both within the group and between the groups in terms of FTND total scores. According to these findings, H₁ and H₂ were accepted.

The systematic review studies have revealed that acceptance and commitment-based interventions increase the rate of smoking cessation and reduce the frequency of cigarette use and the level of dependence[15,16]. Besides, the integration of acceptance and commitment-based interventions into technological applications such as smartphones

and web applications has also been reported to have a similar impact on smoking cessation[21,22].

Turkey is done at a single study, Bal et al., emphasized that acceptance and commitment-based interventions achieved its goal by increasing the ability to realize internal and external stimuli and avoidance behavior and enhancing psychological flexibility in smoking behavior[23].

As a result of the literature and the present study, one of the important components of cigarette or nicotine addiction is the experiential avoidance from negative emotions, which is a negative reinforcer. Smoking may arise as an escape/avoidance behavior to reduce distress experienced depending on negative thoughts, emotion, and physical stimuli. It was believed that the acceptance and commitment-based counseling increased the awareness levels of the individuals about their values and negative internal states, facilitated the acceptance of this situation, and helped the individual to act by his/her values. Acting in this direction may have increased the likelihood of smoking cessation or reduced the frequency of smoking[23,24].

According to the study results, it was determined that the acceptance and commitment-based intervention had positive effects on physical functioning, general health, social functioning, mental health and energy subscales of the quality of life questionnaire. Although there was a positive change in physical role functioning, pain, and emotional role functioning subscales, it did not express a statistical significance. According to these findings, H₃ were accepted

There is a consistency that this intervention has a positive effect on overall quality of life[25]; but since the knowledge level about the subscales of quality of life is limited in the literature and conducting studies on specific fields of the quality of life is recommended in the literature[26], Subscales of SF-36 Quality of life Scale were given below separately.

It has been emphasised that acceptance and commitment-based counseling increases social activities of individuals, improves their social skills and helps them to use these skills in terms of social functioning[27], increases the productivity of the individuals, allows them to find new opportunities and jobs by widening the social environments[28] and thus enhances their quality of life. Although there are studies reporting that acceptance and commitment-based intervention is effective on the social functioning in many physical and mental

disorders[29,30], there is also a study reporting that there is no improvement in this field[31]. It was determined in the present study that social functioning scores of the intervention group were higher than the control group after the application. Also, the post-application scores were higher than the pre-application scores in the intervention group and this difference was statistically significant. This difference does not continue in the follow-up measurements. The increase in the social functioning in the individuals from the intervention group after the intervention may have been due to the adoption and rapid implementation of the applications taught during the intervention. The participants emphasized that their priority values were "children and family". These values may have increased the motivation of individuals to apply breathing exercises and metaphors.

Although many studies reported that acceptance and commitment-based intervention positively affects the physical functioning[29], there are also studies expressing that it does not affect[32,33]. Our study, in the repeated measurements of the intervention group, it was determined that there was a statistically significant difference between the scores before and after counseling and this difference was caused by the follow-up measurement. It is stated that acceptance and commitment-based intervention positively affects the physical functioning by decreasing inadequacy levels due to physical problems and physical movement fear, being aware of the cognitions affecting the life negatively and accepting these negativities and increasing to act following the values[34]. It is also known that physical capacity is closely related to smoking. This increase in the scores in the follow-up measurements can be explained by the physiological changes such as decreasing of myocardial oxygen demand due to the decrease in heart rate, blood pressure and cardiac output in the bodies of individuals along with the smoking cessation[35], decreasing of carboxyhemoglobin level and increasing of oxygen-carrying capacity of blood[36].

Although there are most of the studies reporting that acceptance and commitment-based intervention has a positive effect on mental health of individuals[29,37], there are also studies emphasising that it has no effect[32,38]. It was seen in the present study that the mental health score of the intervention group increased in the measurements after intervention but there was no significant change in the control group.

The present study showed that acceptance and commitment-based intervention affected mental health positively, which is compatible with the literature. It was thought that this effect was achieved by the fact that acceptance and commitment-based intervention increased the realization of the negative emotions and thoughts by the individuals and their copings with them.

Many studies are reporting a positive impact of acceptance and commitment-based intervention on general health[29,31]. It can be said in the present study that general health showed improvement within the group in favor of the intervention group, which is compatible with the literature. This improvement in general health was believed to be affected positively by the subscales of the quality of life questionnaires such as physical functioning, energy, and mental health.

It was determined that even only acceptance in acceptance and commitment-based intervention is closely related with energy and the application increased the energy level[29]. In the present study, it was determined that while there was no statistically significant change in the energy subscale between the groups, the energy scores of the intervention group increased after counseling. It is assumed that this increase occurred as a result of the disappearance of burnout and fatigue symptoms in individuals with smoking cessation after the acceptance and commitment-based intervention and was caused by the increase of the awareness levels of the individuals towards this situation. Moreover, it was estimated that the energy levels of the individuals increased as a result of the elimination of negative effects such as increased heart rate, blood pressure and cardiac output due to smoking[35], decreased oxygen-carrying capacity[36], increased plasma viscosity and fibrinogen levels, and decreased elasticity of erythrocytes and plasminogen levels[39].

Many studies conducted in different patient groups have reported that acceptance and commitment-based intervention has a positive effect on emotional role functioning[28-30]. In contrast to these studies, McCracken et al., (2013) conducted a study with patients with chronic pain and stated that there was no desired increase in the emotional functions of individuals[33]. In the present study, it was found that acceptance and commitment-based intervention did not show a significant change on emotional role functioning either between the groups or within the group. It is believed that the environmental, religious

and ideological structures of the individuals cannot be thought separately in the realization of the emotional role functioning and the individual should be evaluated together with the social structure. Besides, emotional role functioning is a dimension that evaluates the reflection of the emotional problems of individuals on work and other daily activities. The individuals in the present study focused mostly on subjects such as "child and family" and "health. In this aspect, it is estimated that the effect of the intervention is limited to emotional role functioning.

In general, in our study, it is seen that the quality of life is positively affected in the intervention group. However, there is no difference between the intervention and control groups. In this case, different factors affecting the quality of life suggests that we should want to consider. Nurses working with dependent individuals should include to in their work, practices such as acceptance and commitment that increase individuals' awareness and focus on their values. At the same time, it is thought that individuals should make multidimensional evaluations about the factors affecting the quality of life.

The findings of this study are based on personal reports of participants about data on quality of life, smoking cessation rates and nicotine addiction. Therefore, the generalizability of the study is limited. Because of clinical routines, there were divisions within counseling sessions. This is thought to affect the usefulness of sessions.

In conclusion, it was found that acceptance and commitment-based counseling had a positive effect on smoking cessation, nicotine dependence and quality of life in smokers. Accordingly, it may be recommended to extend acceptance and commitment-based counseling applications in smoking cessation interventions. It is also thought that studies to be conducted in different cultures will be useful in testing metaphors. Acceptance and commitment-based counseling training should be provided to nurses and other healthcare professionals. it should be provided they use to in intervention to smoking and other mental and physical illness.

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