

## A Cross-Sectional Pilot Study on Smoking Cessation in Patients with Hypertension and Diabetes in General/Family Practice

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### Abstract

#### Introduction

Smoking is still a common health issue. It predisposes an individual to ill health or disrupts the physiological function of the organism. Smoking is associated with risk of arterial hypertension and diabetes management problems. There is a motivation to change this risk habit. Prochaska and DiClemente developed the stages of change model during addiction treatment. It includes the stages of precontemplation, contemplation, preparation, action, maintenance, with relapse being a time in which an individual, moves backwards from maintenance to other stages.

This study aim was to evaluate smoking cessation in patients with hypertension and diabetes in general/family practice by applying the transtheoretical model.

## Methods

The study was retrospective type carried out in the Health Center Stari Grad, Sarajevo, during February and March 2017. The main research instrument was a questionnaire divided into two parts (Sociodemographic characteristics form and Stage of Change Questionnaire).

## Results

This study included 50 patients treated in general/family practice for type 2 diabetes mellitus and/or hypertension with smoking history. There were 31 current smokers and 19 ex-smokers. Of the active smokers, within the entire sample, 18 (36%) were in the stage of pre-contemplation, 9 (18%) subjects were in the contemplation stage, 4 (8%) subjects were in the preparation stage, 4 (8%) subjects were in the action stage, and 15 (30%) subjects were in the maintenance stage. Misconceptions about the correlation between health problems and smoking were reported.

## Conclusions

There is link between insufficient health knowledge about smoking and practice of smoking. Among factors that cause negative attitudes toward quitting the most important is weight gain in post-cessation period. Health awareness and negative impact of smoking on health should be raised through education, especially in regard to complications that can arise because of smoking. Intervention during smoking cessation, like behavioral counselling and weight control strategies have to be included.

## Abbreviations

WHO - World Health Organization

USA - The United States of America

B&H - Bosnia and Herzegovina

DM - diabetes mellitus

TTM - Transtheoretical Model

SD - standard deviation

## Introduction

Tobacco is legal drug and tobacco use in any form is classified in disorders due to substance use (6C4A.2 Nicotine dependence) according to the International Classification of Diseases [1]. Tobacco use disrupts millions of lives every year [2]. A tobacco-related disease killed around 8 million people in 2017 [3]. Worldwide, overall mortality among smokers is higher than that among nonsmokers and life expectancy for smokers is shorter than for nonsmokers. In USA, overall mortality is about three times higher and life expectancy is shorter by at least 10 years among smokers than among similar people who never smoked [4]. In aged group 30 years and over, tobacco use is a cause of 12% of mortality. Higher risk of death is presented

at smokers that suffer from communicable diseases like tuberculosis and lower respiratory infections, as well as from non-communicable diseases including vascular disease, cancer and respiratory disease. Tobacco use is responsible for 10% of all deaths from cardiovascular diseases, 22% of all cancer deaths, and 36% of all deaths from diseases of the respiratory system [2]. Men are more affected than women in the area of mortality attributable to tobacco [4].

According to WHO estimation among people aged 15 years and older, in 2015 about 38.6% of B&H's population smoked. With the same tobacco control efforts intensity, in 2025 around 35% of the population will be smokers; the rate will be approximately 42.6% for men and 27.5% for women [5].

Smoking is associated with risk of arterial hypertension and diabetes management problems [6]. There is a higher risk for kidney disease, blindness, and circulatory complications for smokers who have been diagnosed with DM. Moreover, smoking is considered to be a cause of type 2 DM. Active smokers have about 30-40% higher risk of developing DM, compared to nonsmokers. This risk rises with the number of smoked cigarettes [4]. Smoking status was registered in 7.319 or 60% of patients with DM in 2014 in system of general/family medicine in Federation of B&H [7]. This high percentage is in line with cigarette smoking prevalence in B&H.

The use of tobacco is the most common preventable cause of disease, disability, and death. Smoking cessation before the age of 40 can change smoking-related disease prevalence and risk of death [8].

Smoking cessation is a complex process. Nicotine is a highly addictive substance, and during quitting there are physical and mental side effects. During the process of nicotine leaving the body following symptoms can be developed: temporary depression, disrupted sleep patterns, irritability, anxiety, difficulty concentrating, increased appetite. Withdrawal period lasts up to three weeks [9]. The success of quit attempts depends on social context and life circumstances [10]. Before smokers are successful at quitting for 1 year or longer the number of quit attempts ranged from 6 to 30. A large number of people is never successful in trying to quit [11].

Thus tobacco use, similar to other risk factors (poor dietary habits, physical inactivity, and alcohol consumption) tends to persist over time. Engagement in unhealthy behaviors can continue without professional intervention. There are several models of change of health risk behaviors [12,13]. One of these models is the Transtheoretical Model (TTM) or Stages of Change Model [14]. It includes five stages: precontemplation, contemplation, preparation, action, and maintenance. In stage of precontemplation, changes in behavior are not intended. Contemplation is characterized with consideration to changes at some nonspecific time in the next months. In stage of preparation, changes are planned in the immediate future. Action is the stage of engagement in behavior change. Maintenance is a constant state of reached behavior change. Most people pass stages of change several times in recycling way before the change becomes truly fixed [15].

Considering tobacco use as the target of interventions that facilitate the decrease of morbidity and mortality and augment quality of life in patients with hypertension and diabetes, this study's aim was to evaluate smoking cessation in patients with hypertension and diabetes in general/family practice by applying the transtheoretical model.

## Materials and Methods

### Setting and Participants

The cross-sectional study was carried out in the Health Center Stari Grad, Sarajevo, during February and March 2017. The research was performed in accordance with ethical principles regarding human experimentation set in the Declaration of Helsinki [16].

### Data Collection

The main research instrument was a questionnaire divided into two parts: Sociodemographic characteristics form and Stage of Change Questionnaire (SCQ).

Questions on the age, sex, educational attainment, occupational status, family status, and reason for admission were included in the Sociodemographic characteristics form included. Height and weight were reported and used to calculate body mass index (kg/m<sup>2</sup>) [17].

Prochaska and Di Clemente developed SCQ [14]. The questionnaire is due to smoking behavior of individuals on which base individuals were allocated to one of the self-defined stages of change.

### Data Analysis

The Statistical Package for Social Sciences software (IBM, version 23.0) was used to perform statistical analyses. Results were expressed as percentages and means±standard deviations. Parametric variables were analyzed using students' t-test. Differences between active smokers and quitters were considered statistically significant at p<0.05.

## Results

**Table 1:** Participants' demographic and clinical characteristics.

Characteristics of participants		N(%) / Mean±SD
Age		53.94±14.12
Gender	Male	29 (58.00)
	Female	21(42.00)
Educational attainment	No formal education	2(4.00)
	Primary school	5(10.00)
	Secondary school	30(60.00)
	Postsecondary, tertiary, or above	13(26.00)

Occupational status	Employed	28(56.00)
	Unemployed	5(10.00)
	Retired	17(34.00)
Family status	Live alone	10(20.00)
	Live with another person	40(80.00)
Reason for admission	Diabetes	10(20.00)
	Hypertension	22(44.00)
	Diabetes & hypertension	18(36.00)

The mean age was 53.94±14.12. From total sample 29(58.00%) were male, and 21(42.00%) female; 20.00% (N = 10) lived alone, 60.00% (N = 30) had at least secondary education, and 56.00% (N = 28) were employed. Diabetes was the reason for admission at 20.00% (N=10), hypertension at 44.0% (N=22) and both, diabetes and hypertension at 36.0% (N=18).

Based on the analysis of smoking status, the stage of lifestyle change in which the subjects find themselves was determined (Table 2).

**Table 2: Stage of Change**

Stage of change		Participants 50(100.00%)		Age (mean±SD)	P	BMI (mean±SD)	P
		N	%				
Active smokers	Precontemplation (no intention to change behavior, do not think about quitting)	18	36.00	49.03±12.55	0.001	28.55±4.97	0.556
	Contemplation (consider change in next six months)	9	18.00				
	Preparation (plan to change in the immediate future, next 30 days)	4	8.00				
Action (engages in behave or change during six months)		3	6.00	61.95±13.09		29.43±5.21	
Maintenance (a constant state of behavior change is reached more than six month)		16	32.00				

In the maintenance stage there were 15(30.00%) long-term quitters (LTQs) who had maintained their nonsmoking for at least 6 months.

The action stage was represented by 4(8.00%) recent quitters (RQs) who had quit smoking on their own within last 6 months.

In the preparation stage there were 4(8.00%) planers who intend to change in the immediate future, within the next 30 days. In the contemplation stage there were9(18.00%). These contemplators (Cs) smoked regularly for the past year but they seriously thought about quitting smoking within the next 6 months.

In the precontemplation stage there were 18(36.00%) immotives (I’s).They had no intention of quitting smoking in the close future.

The mean age of active smokers was 49.03±12.55, and quitters 61.95±13.09.T-Test shows statistics significant (p=0.001). BMI of active smokers was 28.55±4.97, and quitters 29.43±5.21. T-Test shows no statistical significance (p=0.556).

Some of cognitive factors that influence life style are shown in table 3.

**Table 3: Cognitive factors that can influence life style**

Impact of smoking on health status	Level of influence					
	Not at all		A little bit		A lot	
	n	%	n	%	n	%
1) How much smoking has worsened the already existing symptoms of diabetes and hypertension	22	44,00	16	32,00	12	24,00
2) How much would it improve the control of hypertension and diabetes if you quit smoking	20	40,00	10	20,00	20	40,00
3) I am worried about what will happen to my health in the future due to the harmful effects of smoking	20	40,00	13	26,00	17	34,00

As many as 20 (40.00%) subjects do not think about the harmful effects of smoking on their health.

**Discussion**

This study’s aim was to evaluate smoking cessation in patients with hypertension and diabetes in general/ family practice by applying the transtheoretical model. We succeeded to classify patients with hypertension and diabetes into the stages of change according to the TTM. Every stage is characterized with special issues that could be treated in the primary care setting. An assessment of an individual’s stage of change will support selecting the appropriate interventions for a given stage [18].

Of the active smokers, within the entire sample, 18 (36%) were in the stage of pre-contemplation, i.e. they were not thinking about quitting. There were 9 (18%) subjects in the contemplation stage, contemplating to quit smoking in the next six months. There were 4 (8%) subjects in the preparation stage, planning to quit smoking in the next month. The action stage was determined in 4 (8%) subjects, who quit smoking, with the period of change lasting up to six months. In 15 (30%) subjects, the change lasted longer than six months. The mean age of active smokers was 49.03±12.55, and quitters 61.95±13.09.T-Test shows statistical significance (p=0.001).



In our sample 20 (40.00%) subjects did not think about smoking effects on their health. Many patients had misconceptions about the association between their disease and smoking. The results of a Hong Kong study of perceptions about quitting smoking revealed that patients were not aware of the effect of smoking on treatment efficacy and increased DM complications. Moreover they were satisfied with their health status. Quitting was associated with psychological addiction and weight gain [19].

In our sample there, we noticed a difference between BMI in active smokers and quitters. BMI of active smokers was  $28.55 \pm 4.97$ , and quitters  $29.43 \pm 5.21$ . The limitation of this study is associated with its design as a cross-sectional study. Other study that had followed patients revealed that weight gain commonly accompanies quitting. A mean increase is 4-5kg in body weight after 12 months of abstinence. First three months of quitting are critical. There are variations in weight change and about 16% of quitters lose weight and 13% gain more than 10kg [20].

There are several strategies to manage every single stage of change in primary care. As patients in the precontemplation stage may not be aware of the harmful effects of smoking, the best approach is to educate regarding increased risk of cardiovascular disease and micro and macro complications. During contemplation and preparation patients need information how to quit. During action stage focus should be on weight control and prevention of depression, and during maintenance stage on relapse prevention [21,22].

## Conclusion

An important role of family physicians is to help patients change behavior. To do this, family physicians need to understand patient readiness to make change and appreciate barriers to change. According to the TTM, individuals in different stages have specific needs so interventions have to be selected accordingly. Individuals of the same stage can be grouped to offered intervention. Education is crucial to raise health awareness about association between smoking and risk of diabetes and its complications. Weight control strategies should be incorporated in a smoking cessation intervention. In those who are not capable of quitting harm reduction approach should be consider.

## Conflicts of Interests

The authors declare that they have no competing interests.

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