Journal of
Cardiology & Cardiovascular
Surgery

Original Article

DOI: 10.51271/JCCVS-0053

The motivation to quit: smoking cessation rates in ACS versus elective PCI patients

Gamze Yeter Arslan[1], Serdar Söner[2]

[1]Department of Cardiology, Kepez State Hospital, Antalya, Turkiye
[2]Department of Cardiology, Gazi Yaşargil Training and Research Hospital, University of Health Sciences, Diyarbakır, Turkiye

Cite this article: Arslan GY, Söner S. The motivation to quit: smoking cessation rates in ACS versus elective PCI patients. *J Cardiol Cardiovasc Surg.* 2025;3(2):25-28.

Corresponding Author: Gamze Yeter Arslan, dr.gamzeyeterarslan@gmail.com

Received: 15/04/2025 ◆ **Accepted**: 24/06/2025 ◆ **Published**: 27/06/2025

ABSTRACT

Aims: This study aimed to compare six-month smoking cessation rates in active smokers undergoing stent implantation either following an acute coronary syndrome (ACS) event or as part of an elective coronary angiography for stable coronary artery disease (CAD). Additionally, the research sought to identify clinical and psychological determinants associated with successful cessation in both groups.

Methods: This retrospective observational study included 300 current smokers (150 in the ACS group and 150 in the elective PCI group), aged between 35 and 80 years. Demographic data, comorbidities (including diabetes mellitus, hypertension, cronic obstructive pulmonary disease (COPD), heart failure with preserved ejection fraction [HFpEF] and heart failure with reduced ejection fraction [HFrEF]), and smoking status at six-month follow-up were collected. A psychological assessment using the Brief Illness Perception Questionnaire (BIPQ) was conducted in a entire cohort (n=300) to evaluate perceived severity and emotional impact. Statistical analyses included chi-square, t-tests, and multivariable logistic regression to determine independent predictors of cessation.

Results: At six months, the smoking cessation rate was significantly higher among ACS patients (58%) compared to those undergoing elective PCI (32%) ($p<0.001$). Across the entire cohort, higher cessation rates were observed in individuals aged >50 years, female patients, those with diabetes, and especially among patients with HFrEF. BIPQ results across the full cohort showed significantly higher scores for perceived illness severity and emotional response among the ACS group. In multivariable analysis, ACS presentation (OR=2.3, $p<0.001$), HFrEF (OR=1.8, $p=0.02$), and female gender (OR=1.6, $p=0.04$) emerged as independent predictors of cessation.

Conclusion: It is interesting to note that smoking has been identified as a universal and powerful risk factor across all spectra of coronary artery disease, both acute and stable. However, it has been suggested that patients experiencing ACS may be more responsive to cessation efforts, possibly due to heightened emotional distress and perceived threat to life. Patients who are electively undergoing PCI, while equally at risk, may require different motivational strategies. It is suggested that these findings highlight the importance of integrating clinical context with psychological readiness when designing and delivering smoking cessation interventions in cardiology practice.

Keywords: Smoking cessation, acute coronary syndrome, elective PCI, stenting, cardiovascular risk factors, behavior change

INTRODUCTION

Cigarette smoking remains a leading modifiable risk factor for both acute and chronic manifestations of coronary artery disease (CAD). While the association between smoking and cardiovascular morbidity is well-established, the clinical context in which patients are confronted with their diagnosis whether through an acute coronary syndrome (ACS) or an elective coronary angiography may influence their readiness and motivation to quit smoking.[1] Exploring the interplay between clinical presentation and smoking cessation can provide valuable insights for targeted intervention strategies. Coronary artery disease (CAD) is the leading cause of morbidity and mortality worldwide. Among the numerous risk factors, cigarette smoking remains one of the most preventable causes of cardiovascular disease. The World Health Organization reports that smoking contributes to over 8 million deaths annually, with a substantial proportion related to cardiovascular events.[2] Numerous studies have confirmed the association between smoking and increased CAD risk. The INTERHEART study reported that smoking accounts for 36% of the global population-attributable risk for myocardial infarction.[3] The Framingham Heart Study also demonstrated a clear dose-response relationship between smoking intensity and CAD incidence. Furthermore, secondhand smoke exposure is associated with increased CAD events, highlighting the broader public health implications.[4]

Smoking is a leading risk factor for cardiovascular disease and continues to contribute significantly to global mortality. Despite public health efforts, smoking cessation rates remain low among patients with coronary artery disease. An ACS often represents a turning point in a patient's perception of health, potentially triggering motivation to quit smoking. In contrast, patients undergoing elective procedures may not perceive an immediate threat to life, and thus may be less motivated to alter risky behaviors.[5] This study investigates whether clinical urgency, as represented by ACS, is associated with higher smoking cessation rates than elective PCI.

Study endpoints; The primary endpoint of the study is the comparison of the proportion of individuals who completely quit smoking six months after undergoing stent implantation due to ACS versus those who received stents following elective coronary angiography. This endpoint aims to reveal the relationship between smoking cessation behavior and the mode of clinical presentation (urgent vs. elective). The secondary endpoints are as follows:

1. To evaluate the impact of comorbid conditions (diabetes, hypertension, COPD, and heart failure) on smoking cessation rates.
2. To compare smoking cessation rates according to the type of heart failure [heart failure with preserved ejection fraction (HFpEF) vs. heart failure with reduced ejection fraction (HFrEF)].
3. To analyze the influence of demographic variables such as age (>50 years) and gender on smoking cessation outcomes.
4. To assess the association between scores from the Brief Illness Perception Questionnaire (BIPQ) and smoking cessation, focusing on the following dimensions:[6]
   - Perceived severity of illness
   - Emotional response
   - Level of concern
   - Perceived control

These endpoints aim to provide a comprehensive evaluation of both clinical and psychological factors influencing smoking cessation among patients with coronary artery disease.

METHODS

The study was conducted with the permission University of Health Sciences Gazi Yaşargil Training and Research Hospital Clinical Researches Ethics Committee (Date: 23.05.2025, Decision No: 466). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. This retrospective observational study included 300 patients who underwent coronery angiography and stent implantation in cardiology clinic between September 2024 and March 2025. Patients were divided into two groups: those presenting with ACS (n=150) and those undergoing elective PCI (n=150). Inclusion criteria were age between 35–80 years, active smoking status at admission, and complete follow-up data at 6 months. Exclusion criteria included history of psychiatric illness, participation in structured smoking cessation programs, or loss to follow-up.

Statistical Analysis

Data collected included demographic characteristics (age, sex), comorbidities (diabetes mellitus, hypertension, COPD, HFpEF, HFrEF), and self-reported smoking status at 6 months. Statistical analysis was performed using SPSS v28. Continuous variables were assessed for normality using the Shapiro-Wilk test and expressed as mean±SD or median (IQR) as appropriate. Categorical variables were expressed as counts (percentages). Comparisons between groups were made using independent Samples t-tests or Mann-Whitney U tests for continuous variables and Chi-square or Fisher's exact test for categorical variables. Univariable logistic regression was used to identify variables associated with smoking cessation. Variables with $p<0.10$ were entered into multivariable logistic regression models. Statistical significance was set at $p<0.05$.

RESULTS

A total of 300 patients were included in the study. Demographic and clinical characteristics are summarized in **Table 1**. The ACS group had a slightly higher prevalence of diabetes and reduced EF heart failure, while the elective PCI group had a higher incidence of COPD. At 6 months, smoking cessation was reported by 87 (58%) of ACS patients compared to 48 (32%) in the elective PCI group ($p<0.001$). Subgroup analysis showed significantly higher cessation rates among patients aged >50, females, diabetics, and those with HFrEF (**Figure**). **Table 2** summarizes smoking cessation rates by subgroup.

Table 1. Demographic and clinical characteristics of study participants

Variable	ACS group (n=150)	Elective PCI group (n=150)	p-value
Age >50 years (%)	109 (72.7%)	104 (69.3%)	0.53
Male gender (%)	92 (61.3%)	88 (58.7%)	0.68
Female gender (%)	58 (38.7%)	62 (41.3%)	0.68
Diabetes mellitus (%)	60 (40%)	48 (32%)	0.14
Hypertension (%)	64 (42.7%)	56 (37.3%)	0.36
COPD (%)	28 (18.7%)	35 (23.3%)	0.33
HFpEF (%)	16 (10.7%)	23 (15.3%)	0.24
HFrEF (%)	29 (19.3%)	21 (14.0%)	0.22
Subgroup	**ACS group quit (%)**	**Elective PCI group quit (%)**	**p-value**
Overall	58%	32%	<0.001
Age >50	65%	40%	0.01
Female	62%	36%	0.02
Diabetes	63%	45%	0.03
HFrEF	70%	46%	0.02
Perceived severity	8.1±1.0	6.6±1.3	<0.001
Emotional response	7.7±1.2	5.9±1.5	<0.001
Consequences	8.3±1.1	6.3±1.4	<0.001
Illness concern	7.5±1.4	6.0±1.6	<0.01

ACS: Acute coronary syndrome, PCI: Percutaneous coronary intervention, COPD: Cronic obstructive pulmonary disease, HFpEF: Heart failure with preserved ejection fraction, HFrEF: Heart failure with reduced ejection fraction, Values represent means±SD or percentages as indicated. Statistical significance defined as $p<0.05$

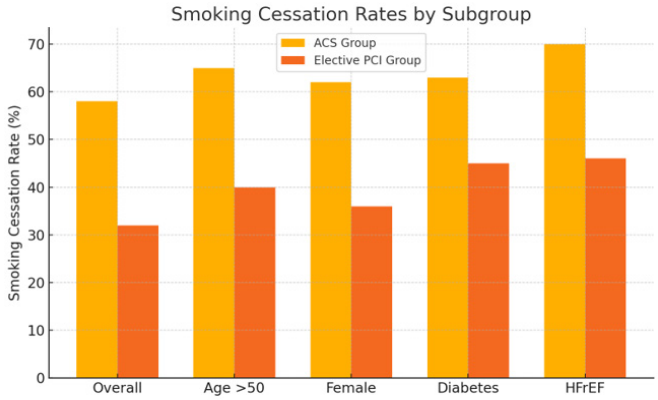

Figure. Comparison of smoking cessation rates between ACS and Elective PCI groups across key subgroups. The chart demonstrates consistently higher cessation rates among ACS patients, especially in those with HFrEF and diabetes

Table 2. Smoking cessation rates by subgroup at 6 months

Subgroup	ACS group quit (%)	Elective PCI group quit (%)	p-value
Overall	58%	32%	<0.001
Age >50	65%	40%	0.01
Female	62%	36%	0.02
Diabetes	63%	45%	0.03
HFrEF	70%	46%	0.02

ACS: Acute coronary syndrome,PCI: Percutaneous coronary intervention, HFrEF: Heart failure with reduced ejection fraction, Values represent means±SD or percentages as indicated. Statistical significance defined as p<0.05

Psychological evaluation using the BIPQ was conducted in a subset of 300 patients. ACS patients scored significantly higher on perceived severity and emotional response scales (Table 3). Multivariable logistic regression analysis identified ACS presentation and HFrEF as independent predictors of smoking cessation (Table 4).

Table 3. Psychological assessment scores (BIPQ Subset, 300)

Domain	ACS group (n=150)	Elective PCI group (n=150)	p-value
Perceived severity	8.1±1.0	6.6±1.3	<0.001
Emotional response	7.7±1.2	5.9±1.5	<0.001
Consequences	8.3±1.1	6.3±1.4	<0.001
Illness concern	7.5±1.4	6.0±1.6	<0.01

ACS: Acute coronary syndrome, PCI: Percutaneous coronary intervention, Values represent means±SD. Statistical significance defined as p<0.05.

Table 4. Multivariable logistic regression for smoking cessation

Variable	Odds ratio	95% CI	p-value
ACS presentation	2.3	1.5 – 3.6	<0.001
HFrEF	1.8	1.1 – 2.9	0.02
Female gender	1.6	1.0 – 2.6	0.04
Age >50	1.4	0.9 – 2.3	0.08

ACS: Acute coronary syndrome, HFrEF: Heart failure with reduced ejection fraction, CI: Confidence interval, Values represent means±SD or percentages as indicated. Statistical significance defined as p<0.05

DISCUSSION

This study demonstrates that patients presenting with ACS are more likely to quit smoking after PCI compared to those undergoing elective interventions. The findings suggest that the perceived threat of a life-threatening event such as ACS plays a significant motivational role. In addition, comorbidities such as diabetes and heart failure appear to increase cessation rates, possibly due to increased patient awareness of risk.

Psychological assessment reinforced this conclusion. Higher perceived severity and emotional response scores among ACS patients imply that emotional engagement and illness perception contribute to behavioral change. These results are consistent with the Health Belief Model and prior literature indicating that acute illness can serve as a teachable moment.

The benefits of smoking cessation are substantial and begin soon after quitting. Within 12 months, the risk of coronary events is reduced by nearly 50%, and long-term cessation normalizes cardiovascular risk.[7] Smoking cessation improves survival and reduces recurrent ischemic events in patients with established CAD.[8] Accordingly, international guidelines such as those by the ESC and AHA recommend routine assessment of smoking status and implementation of behavioral and pharmacologic interventions for cessation.[9]

This study's strength lies in its comprehensive clinical and psychological evaluation. However, it is limited by its retrospective design and reliance on self-reported cessation without biochemical validation. Future studies should employ longitudinal designs and include structured smoking cessation interventions to validate these findings.In addition to perceived health threats, the fear of death experienced during an acute coronary event may play a substantial role in smoking cessation. Patients hospitalized with ACS often undergo emotionally intense situations such as emergency procedures, intensive monitoring, and discussions about mortality risks. This confrontation with potential fatality may trigger a psychological phenomenon known as 'mortality salience, which can lead to significant behavior change in an effort to prolong life.[10] Such emotionally charged events often serve as powerful motivators, reinforcing the urgency and necessity to quit harmful habits like smoking.

Limitations

First of all our clinical study are retrospective, single centered, and has small number of patients. Future studies may be needed. Another limitation of this study is the lack of data regarding the duration and intensity of smoking (e.g., pack-years). Although cumulative tobacco exposure may influence nicotine dependence and the likelihood of cessation, such information was not consistently available in our retrospective cohort. Importantly, acute events such as ACS may serve as overriding motivational triggers regardless of baseline smoking duration. However, we acknowledge that not accounting for long-term smoking history may have

influenced cessation outcomes. Future prospective studies should include detailed assessments of smoking duration and dependence severity to better evaluate their impact on cessation success.

CONCLUSION

The clinical presentation of smoking cessation has been demonstrated to exert a significant influence on the process. The present study found that ACS patients were more likely to quit smoking, as evidenced by both statistical and psychological data. It is hypothesised that targeting patients during periods of emotional and health vulnerability may increase the effectiveness of cessation programmes. Personalised interventions should consider both clinical and psychological profiles in order to maximise success. It is evident that cigarette smoking constitutes a significant and modifiable risk factor for CAD. In view of its extensive ramifications for vascular biology and clinical outcomes, smoking cessation should be a fundamental component of both primary and secondary cardiovascular prevention programmes.The implementation of more robust public health policies and clinical strategies is imperative in order to reduce tobacco use and prevent smoking-related cardiovascular events.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was conducted with the permission University of Health Sciences Gazi Yaşargil Training and Research Hospital Clinical Researches Ethics Committee (Date: 23.05.2025, Decision No: 466).

Informed Consent

Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

REFERENCES

1. Critchley JA, Capewell S. Smoking cessation for the secondary prevention of coronary heart disease. *Cochrane Database Syst Rev*. 2004;4(1):CD003041. doi:10.1002/14651858.CD003041.pub3
2. Kotseva K, Wood D, De Backer G, et al. EUROASPIRE III: a survey on the lifestyle, risk factors and use of cardioprotective drug therapies in coronary patients. *Eur J Cardiovasc Prev Rehabil*. 2009;16(2):121-137. doi:10.1097/HJR.0b013e3283294b1d
3. Prochaska JO, DiClemente CC. Stages and processes of self-change of smoking: toward an integrative model of change. *J Consult Clin Psychol*. 1983;51(3):390-395. doi:10.1037/0022-006X.51.3.390
4. Leventhal H, Brissette I, Leventhal EA. The common-sense model of self-regulation of health and illness. In: Cameron LD, Leventhal H, eds. The Self-Regulation of Health and Illness Behaviour. London, UK: Routledge; 2003. doi:10.4324/9780203361063_chapter_2
5. Broadbent E, Petrie KJ, Main J, Weinman J. The Brief Illness Perception Questionnaire. *J Psychosom Res*. 2006;60(6):631-637. doi:10.1016/j.jpsychores.2005.10.020
6. Fiore MC, Jaén CR, Baker TB, et al. Treating Tobacco Use and Dependence: 2008 Update. Rockville, MD: US Department of Health and Human Services; 2008. doi:10.1037/e527352011-001
7. Tannenbaum MB, Hepler J, Zimmerman RS, et al. Appealing to fear: a meta-analysis of fear appeal effectiveness and theories. *Psychol Bull*. 2015;141(6):1178-1204. doi:10.1037/a0039729
8. Hay JL, Buckley TR, Ostroff JS. The role of cancer worry in cancer screening: a theoretical and empirical review of the literature. *Psychosomatics*. 2005;46(1):2-13. doi:10.1176/appi.psy.46.1.2
9. Clark AM, Spaling MA, Harkness K, et al. Determinants of effective heart failure self-care: a systematic review of patients' and caregivers' perceptions. *Heart*. 2014;100(9):716-721. doi:10.1136/heartjnl-2013-304852
10. Bandura A. Social foundations of thought and action: a social cognitive theory. Englewood Cliffs, NJ: Prentice Hall; 1986. doi:10.1037/13273-000