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Original Research Article

Frequency of Smoking Cessation Following Acute Coronary Syndrome: A Review of Effective Counselling

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Abstract: *Acute coronary syndrome (ACS) is known to be among the most prevalent causes of mortality and is particularly worsened by smoking. Optimally designed and implemented cessation interventions in the following days or weeks after the first ACS event are warranted in Pakistan, where tobacco use remains pervasive.* ***Objective:*** *To evaluate the frequency of smoking cessation post-ACS in patients undergoing percutaneous coronary intervention (PCI) and assess the effectiveness of pre-discharge counseling in Khyber Pakhtunkhwa, Pakistan.* ***Methods:*** *This cross-sectional study was conducted on 200 patients of ACS presenting for PCI at MTI-Peshawar Institute of Cardiology in the duration from July, 2024 to December, 2024. All patients reported pre-discharge counseling for cessation, and their cessation was reinforced at 1, 3, and 6 months.* ***Results****: Among 200 patients 46% quit tobacco at 6 months, quit rates were higher among educated 60% and professional 55%. Frequency of use (44%) was attributed to cultures and psychological factors.* ***Conclusion:*** *Pre-discharge counseling achieved moderate cessation success, but sustained interventions are needed to address regional challenges and improve outcomes.*

Keywords: Acute coronary syndrome, smoking cessation, percutaneous coronary intervention, counseling, Pakistan

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Introduction

Tobacco smoking is still one of the leading causes of cardiovascular diseases, especially acute coronary syndromes (ACS) such as unstable angina, non-ST-segment elevation myocardial infarction (NSTEMI), and ST-segment elevation myocardial infarction (STEMI). A major global contributor to morbidity and mortality, ACS is closely associated with such modifiable risk factors as smoking, which contribute to the acceleration of atherosclerosis, impairment of endothelial function, and increased risk of adverse cardiovascular events (2). Although there have been numerous interventions to discourage tobacco use owing to the adverse effects on human health, a sizable proportion of ACS patients remain smokers after their diagnosis, and this increases their vulnerability to other events and mortality (3). This chronic problem underscores the need for effective smoking cessation interventions to be explicitly provided to ACS survivors to reduce the effects of tobacco products on cardiovascular diseases (4). Current rates indicate that about 20% to 30% of those who are admitted to the hospital for an ACS are smokers, which is suggestive of the chronic dependence on tobacco amongst this group of patients (5). It appears that smokers with ACS are at a significantly higher risk of mortality and recurrent CV events compared to nonsmokers. At the same time, patients who continue smoking after the initial ACS are twice as likely to experience adverse outcomes (6). Smoking increases inflammation and platelet activation and impairs coronary circulation, which contributes to the increased severity of ACS and poor prognosis (7). On the other hand, smoking cessation after an event of ACS can cut down the mortality rate by as much as 50%, further revealing the positive impact of quitting for better outcomes for patients (8). However, it has been shown that only 20% to 30% of ACS patients remain abstinent after the event while receiving cessation interventions (9).

Smoking behaviors in ACS patients are not only complex because of the multiple risk factors related to both psychological and social aspects as well as physiological ones. Depression is common among ACS survivors and frequently interferes with cessation efforts because individuals may use tobacco to self-medicate feelings of depression (10). Other factors, including poor education, low economic status, and job insecurity, also reduce the chances of quitting since cessation aids are scarcely available in such populations (11). Smoking cessation with mood management has been demonstrated to tackle these psychological barriers, and empirically supported cardiac rehabilitation with counseling, exercise, and lifestyle interventions boosts smoking cessation and cardiovascular health (12). These programs underline a multipronged approach in relating and addressing the factors that contribute to tobacco dependence among these patients (13).

In Pakistan, where cardiovascular diseases are a significant burden, little information exists about smoking cessation after ACS, even though tobacco use, both by cigarettes and smokeless tobacco such as snuff, is widespread (14). Tobacco use and cultural and regional preferences regarding their use call for culturally appropriate interventions to aid in cessation (15). New technologies like smartphone applications and prescription medications for adherence have been shown in recent studies to increase smokers' compliance with cessation guidelines; however, controls continue to be low in environment-poor countries like Pakistan (1, 2). Motivational interviewing, as well as relapse prevention during pre-discharge counseling, is essential in encouraging cessation, and studies have postulated that personalized interventions improve quit rates considerably (3).

The remaining cessation rates observed after ACS imply that there are preventable barriers to smoking cessation, as well as the need for practical, feasible, and culturally sensitive interventions (4). Mindful informational psychological interventions that increase perceived health self-efficacy are a new method of helping patients adhere to cessation and other behaviors, thus complementing traditional counseling (5). Furthermore, effective smoking cessation, which is part of the overall and long-term risk management of ACS, should include such duties as post-PCI care to minimize the recurrence of events and improve overall outcomes (6). The scarcity of regional data in Pakistan serves to emphasize the usefulness of local research in influencing policy and

practice, especially in high-risk populations, including the people of Khyber Pakhtunkhwa (7).

This study aims to determine the rate of smoking cessation among the ACS patients of PCI in Peshawar Institute of Cardiology, with special emphasis on pre-discharge counseling. Furthermore, the 1, 3, and 6-month follow-up data on cessation will define the local population's response to the global counseling approaches and the determinants of cessation (8). The results helps to address critical gaps in the literature by identifying factors that may influence smoking cessation in a high-risk population (9). This study helps in the identification of gaps that would enable the improvement of counseling approaches, better incorporation of cessation into the management of ACS, and consequently reduce the cardiovascular burden from the use of tobacco in Pakistan and other similar settings (10).

Objective: To determine the frequency of smoking cessation post-acute coronary syndrome in patients undergoing percutaneous coronary intervention and evaluate the effectiveness of pre-discharge counseling in Khyber Pakhtunkhwa, Pakistan.

Methodology

Prospective Observational Study. The study was carried out in the MTI-Peshawar Institute of Cardiology which is a tertiary care hospital located in Peshawar, Pakistan. This study was carried out from July 2024 to December 2024, with follow-up visits at 1, 3, and 6 months after the PCI. Inclusion criteria were as follows, patients aged between 20 to 80 years, male and female, diagnosed with ACS who had an indication for PCI and received it during the index hospitalization. Patients were excluded if they refused to consent, had chronic renal disease and chronic pulmonary disease, or if they don't receive PCI during their first hospital stay. Patients were included from the MTI-Peshawar Institute of Cardiology between July 1, 2024, and December 31, 2024, after getting approval from the Hospital's Ethical Committee. Patient information was provided to them before asking for their informed consent to participate in the study. A structured proforma ensured that data on demographic characteristics, smoking history, and clinical details were obtained. All participants undergo discharge counseling before dismissal from the hospital following a specific script to educate the patient on the dangers of smoking, encourage the patient to quit smoking, motivational interviewing, and relapse prevention. Subsequently, contact information was taken to follow up on the matter. Smoking status and relapse to smoking or any adverse clinical event was determined in patients undergoing percutaneous coronary intervention at 1, 3, and 6 months. All the information was recorded in Excel sheets for further analysis. Descriptive statistics described cessation rates, and inferential statistics was compared the impact of counseling to guide future cessation interventions.

Results

Overall, 200 patients with Acute Coronary Syndrome (ACS) who underwent Percutaneous Coronary Intervention (PCI) from the period of July 1, 2024, to December 31, 2024, at MTI-Peshawar Institute of Cardiology were included in this study. The participants consisted of mostly males (92%) with a mean age of 58.3 years and an age range between 34 to 95 years. At baseline, all participants were using tobacco in any form, and among them, 78 % used cigarettes, while 12 % used snuff, and the remaining 10 % used both cigarettes and snuff. Regarding education standards, 61% did not go to school, 45% completed their matriculations, 21% each completed their primary education, 13% completed their intermediate, and only 3% had a bachelor's degree and above. The results of the study showed that all the patients were counselled on smoking cessation before discharge.

At 6-month follow-up, 92 patients (46%) reported no tobacco use, 88 (44%) reported continued tobacco use, and 20 (10%) patients were either lost to follow or dead. Meta-analysis After pooling the data, it was found that 72 out of 156 (46%) cigarette smokers, 10 out of 24 (42%) snuff users, and 10 out of 20 (50%) dual users ceased smoking or smokeless tobacco use. Cessation rates were higher among patients with postprimary education (a total of 60% for patients with a bachelor's degree or higher versus 40% for uneducated patients.

The occupation and age, in specific ways, affected cessation success. Teachers, government servants etc had a 55% quit rate than the laborers, who were only 38%. The cessation rate was significantly higher amongst patients ≤50 years, with a 50% level, and was 44% for >50 years. The adverse outcomes also included two deaths and 15 recurrent cardiovascular events, mainly among persistent smokers.

These results suggest moderate cessation success after PCI, depending on education, occupation, and age. Despite these findings, the use of tobacco persists and remains a significant challenge that requires better strategies for counseling.

Table 1: Baseline Characteristics of Study Participants (n=200)

Characteristic	Value
Mean Age (years)	58.3 (range: 34–95)
Male, n (%)	184 (92%)
Tobacco Type, n (%)	
Cigarettes	156 (78%)
Snuff	24 (12%)
Both	20 (10%)
Educational Level, n (%)	
Uneducated	80 (40%)
Primary	30 (15%)
Matric	60 (30%)
Intermediate	20 (10%)
Bachelor's or Higher	10 (5%)

Table 2: Smoking Cessation Outcomes at 6 Months Post-PCI (n=200)

Outcome	n (%)
Ceased Tobacco Use	92 (46%)
Continued Tobacco Use	88 (44%)
Lost to Follow-Up/Deceased	20 (10%)
Cessation by Tobacco Type	
Cigarettes (n=156)	72 (46%)
Snuff (n=24)	10 (42%)
Both (n=20)	10 (50%)

Table 3: Factors Associated with Smoking Cessation (n=180, excluding lost to follow-up)

Factor	Ceased (n=92)	Continued (n=88)
Age ≤50 years, n (%)	30 (50%)	30 (50%)
Age >50 years, n (%)	62 (44%)	58 (56%)
Professional Occupation, n (%)	33 (55%)	27 (45%)
Laborer, n (%)	30 (38%)	49 (62%)
Higher Education (≥Intermediate), n (%)	18 (60%)	12 (40%)
Uneducated, n (%)	32 (40%)	48 (60%)

Discussion

The results of this study, conducted within the MTI-Peshawar Institute of Cardiology, offer essential information on the rates of smoking quit among ACS patients who undergo PCI in Khyber Pakhtunkhwa in Pakistan. The overall cessation of 46% at 6 months after PCI is consistent with global statistics that cite 20–30% cessation rates at six months within ACS patients and also underscores the potential for continued difficulty in maintaining smoking cessation (1). This sample's 14% success rate highlights the benefit of a counseling session before discharge, which

employed motivational interviewing and strategies to prevent relapse. It also suggests a need for more intensive, client-specific interventions to counter the numerous challenges experienced by this group of smokers (2). Tobacco use data are high (100% of participants were current users at admission), indicative of the region's smoking dependence and cultural acceptance of cigarettes as well as the acceptable ability of smokeless tobacco in the form of snuff that was used by 22% of the participants in the study(3).

Several factors affected cessation outcomes, including education level, occupation, and age. In the study, patients with intermediate or above education had a cessation rate of 60 % compared to 40% for uneducated patients. On the same note, literature shows education about health, health literacy, and the ability to accept cessation advice (4). This could be attributed to increased awareness of the cardiovascular risks of smoking and higher availability of healthcare resources among educated patients (5). For example, professional occupations like teachers and government servants reported a 55% cessation rate, while laborer occupations were at 38%, pointing towards socioeconomic factors like financial security and employment support for health-related behaviors (6). Patients aged ≤ 50 years had significantly higher cessation rates (50%) compared with patients aged > 50 years (44%), which can attributed to increased willingness to change after the ACS event or lower years of tobacco dependence (7). Hence, these findings underscore the crucial importance of socio-demographic and other gaps in cessation support, especially based on a low altitude of cessation support services like in Pakistan(8).

It was similarly established that the specific type of tobacco put to use also affected cessation results. Cigarette smokers quit at 46%, snuff users' quit rate stood at 42%, and combined users' quit rate was at 50%. The slightly lower cessation rate among snuff users may be due to the culture of smokeless tobacco in Khyber Pakhtunkhwa, where products such as naswar are commonly used and are considered less risky than cigarette smoking (9). This is quite a complex interference since smokeless tobacco has specific cardiovascular effects, such as hypertension and impaired endothelial function (10). This can further be attributed to the fact that dual users seem to have a higher cessation rate after acquiring an ACS due to the interaction of the multiple forms of tobacco, which poses a higher risk to their health. These results indicate the need for culturally appropriate counseling advice about the various forms of smoking with more emphasis on portraying the dangers of smokeless tobacco to enhance the chances of quitting (12).

Although a moderate level of success was recorded in the pre-discharge counseling, an alarming 44% of the patients resumed tobacco use, pointing to continued challenges to quitting. Essentially, mental conditions such as depression that is evident among patients with ACS is likely to have led to relapse because tobacco is often used as a way of dealing with stress. The recent trials discussed in this paper can be helpful in overcoming this barrier through the inclusion of the use of mood management in cessation programs and support (14). Moreover, the high follow-up loss rate of 10%, two deaths, and 15 recurrent cardiovascular events support the need for continued post-discharge intervention. Majority of these complications were observed among patients with continued smoking supporting the evidence of poor prognosis of ACS among persistent smokers. Mobile-based applications, pharmacotherapeutic aids, which might help in adherence to cessation protocols could help in follow-up and support in areas with limited resources like Pakistan but they are underutilized (1, 2).

These revelations can affect how clinical practice and public health policies operate in Pakistan. The moderate rate of cessation points to the need to augment pre-discharge counseling with other sustainable approaches like community support or phone counseling programs, among others (3). Cardiac rehabilitation, which encompasses cessation along with exercise training and other lifestyle alterations, has shown cessation and cardio-metabolic benefits, but it is not still widely available in Pakistan (4). Extending such a program, coupled with improving the availability of prescription cessation pharmacotherapies, might help counter the international and local low utilization (5). In addition, the cultural and regional characteristics of Khyber Pakhtunkhwa require approaches that overcome the perception that smokeless tobacco is harmless and engage leaders to quit (6).

The study limitations in our work include attrition, where participants were lost to follow-up, which may have influenced the cessation rates noted in the study, and the absence of data on mental health disorders like depression, which can affect cessation. Future research should also investigate these factors and compare the cost benefits of implementing other approaches, including mindfulness-based interventions, as they help increase perceived health competence and cessation (7). The study's findings are restricted to patients who received PCI across the broad category of ACS. Readers are also advised to engage in further studies to generalize the study's discovery across non-PCI ACS patients (8). However, the study contributes to the dearth of regional data and aims to tailor cessation interventions in Pakistan better. Future efforts in eliminating these socioeconomic, cultural, and psychological barriers to cessation may help increase cessation rates, reduce recurrent cardiovascular event rates, and lessen the burden of ACS in these at-risk groups (9).

Conclusion

The present study at the MTI-Peshawar Institute of Cardiology found a 46% smoking cessation rate of the ACS patients who underwent PCI, signifying the moderate success of the pre-discharge counseling in Khyber Pakhtunkhwa, Pakistan. Further, the cessation rates were significantly lower in younger patients and those with higher education and working professionals, indicating the role of sociodemographic factors. Nevertheless, 44% of the patients remained tobacco users due to the cultural acceptability of smokeless tobacco, psychological factors, and the lack of follow-up support. This study also underlines the significance of using culture-focused interventions that consider regional trends of tobacco use and incorporate mood control and substance dependency management and patients' follow-ups. Promoting cardiac rehabilitation and increasing access to pharmacological treatments are the ways to improve cessation rates. Although the study is severally limited by loss to follow-up, it is important in providing evidence for regional intervention strategies to decrease tobacco-related ACS risks in Pakistan.

Declarations

Data Availability statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-PICAS-0345-24)

Consent for publication

Approved

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Conflict of interest

The authors declared the absence of a conflict of interest.

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All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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