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Research Article

Prevalence of Tobacco and Betel Nut Use among Cancer Patients in Two Major Hospitals in Karachi

Samia Ayub[1], Kashmala Hussain[2], Umm-e-Abiha[3], Hania Fatima[4], Amal Mahmood[5], Javaid Ahmed Khan[6]

[1]Department of Pulmonology, Fatima Jinnah General & Chest Hospital, Quetta Pakistan
[2-5]Department of Pulmonology, Medical College, Aga Khan University, Karachi Pakistan
[6]Department of Medicine, Aga Khan University, Karachi, Pakistan
Corresponding author: Dr. Samia Ayub, Medical Officer, Fatima Jinnah General & Chest Hospital, Quetta Balochistan, Pakistan, Email: samia.ayub.23.04@gmail.com

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ABSTRACT

Background: Tobacco use, both smoked and smokeless, is prevalent in South Asia, including Pakistan. It is associated with various cancers, notably oral, esophageal, and oropharyngeal cancers. Despite the significant correlation between tobacco use and cancer, there is limited research on the prevalence of all tobacco forms among cancer patients in Pakistan.

Objective: To assess the prevalence of tobacco use among cancer patients in Karachi and evaluate their awareness of the hazards of tobacco pre-diagnosis.

Study Design: Prospective cross-sectional study

Place and Duration of Study: Aga Khan Hospital and Bait-ul-Sukoon Hospital, Karachi from 31st October 2023 to 31st March 2024.

Methodology: One hundred and eighty three cancer patients were enrolled. Data was collected via a questionnaire addressing demographic details, tobacco use, cancer characteristics, and awareness of tobacco hazards.

Results: The female (73.2%) patients were predominantly from urban areas (77.0%), with an average age of 49.65 years. The most common cancers were breast and reproductive cancers (55.7%), followed by digestive tract and head and neck cancers (14.8% each). Tobacco use was reported by 23.5% of patients, with betel nut being the most common smokeless form (14.2%). Post-diagnosis tobacco cessation rates were similar to pre-diagnosis rates. Awareness of tobacco hazards was high, with 56.8% fully aware, but 28% were only partially aware or unaware. A significant majority (72.1%) supported a ban on tobacco products.

Conclusion: Substantial prevalence of tobacco use among cancer patients, with a cultural preference for smokeless forms. The high level of awareness about tobacco hazards and strong support for a ban indicate potential for effective legislative measures.

Key words: Betel nut, Tobacco use, Cancer, Prevalence, Smokeless tobacco

INTRODUCTION

Betel nut and various forms of tobacco use are highly prevalent in South Asian countries, including Pakistan. In Pakistan, several forms of tobacco are available that may be chewed, sucked, or applied to gums or teeth. These include combusted forms such as cigarettes and water pipes (hukkah/shisha), as well as non-combusted forms like dried or moist snuff (loose or pouched forms of tobacco and naswar), and chewable loose leaf, plug, or twist (pan and ghutka).[1]

Both smoked and smokeless forms of tobacco are associated with various types of cancers. Betel nut use has been linked to oral and esophageal cancers, while smoked forms are associated with a broader range of cancers.[2] Chewable forms of tobacco contain alkaloids and tannins that can lead to precancerous lesions in the mouth, such as leukoplakia, erythroplakia and oral submucous fibrosis, which may eventually develop into oropharyngeal cancers.[2,3]

In Pakistan, 19.1% (23.9 million) of adults currently use tobacco products, with 31.8% of men and 5.8% of women being users. The prevalence of current tobacco smoking is 22.2% among men and 2.1% among women. Tobacco smoking is more common in rural areas (13.9%) compared to urban areas (10.0%). Additionally, 7.7% (9.6 million) of adults currently use smokeless tobacco products, with a higher prevalence in rural (8.2%) than urban areas (6.7%).[3,4]

Cancer is a major cause of morbidity and mortality in Pakistan, with an increasing incidence in recent years. According to the International Agency for Research on Cancer (IARC), Pakistan reports 0.18 million newly diagnosed cancer cases annually, with 0.11 million cancer-related deaths and 0.32 million prevalent cases over five years.[2] Tobacco use

significantly contributes to the high incidence of various cancers.

Despite the evident correlation between tobacco use and cancer, there are few studies in Pakistan that evaluate the prevalence of all forms of tobacco use among cancer patients. The purpose of this study is to assess the prevalence of tobacco use among cancer patients in two major hospitals in Karachi. A multi-centre case control study from 2012 was established betel nut and tobacco use as independent risk factors for developing esophageal cancer in Karachi.[5] This study aims to fill the gap by evaluating the prevalence of tobacco use among different types of cancer patients in two major hospitals of Pakistan, providing essential data to understand the scope of the issue and guide future interventions. In addition, the study seeks to evaluate the awareness among cancer patients about the hazards of different forms of tobacco pre diagnosis. Combating the high rates of cancer in Pakistan requires a multi-faceted approach involving collaboration between governments, healthcare professionals, non-governmental organizations, and communities to effectively address the complex factors contributing to this public health concern.

MATERIALS AND METHODS

This prospective cross sectional study design was used to assess the prevalence of tobacco use, including smoked and smokeless forms, and its association with various types of cancers. The source population for this study included cancer patients admitted to or visiting the outpatient clinics of Aga Khan Hospital and Bait-ul-Sukoon Hospital, Karachi from 31st October 2023 to 31st March 2024.This study was conducted after approval of the College of Physicians and Surgeons of Pakistan and the Hospital's ethics review committee (ERC) before the commencement of the study. All admitted patients with cancer in wards and special care units meeting the inclusion criteria were included after taking informed consent. Two surveyors were assigned to collect the data over the period using a predesigned questionnaire after taking informed consent. The questionnaire included a mix of open-ended and closed-ended questions, ensuring both structured responses and the opportunity for participants to provide detailed, qualitative information. Sections addressed various factors such as age, gender, ethnicity, education, socioeconomic background, occupation, and area of residence. All regulatory requirements were strictly followed to maintain ethical conduct and uphold the trust and integrity of scientific research. Using non-probability convenient sampling, participants meeting predefined inclusion and exclusion criteria were conveniently selected from this population. This sampling approach allowed for practical and accessible recruitment of study subjects from the target population, facilitating data collection within the study's resource and time constraints. Keeping a margin of error at 5% and a confidence interval of 95%, and considering the prevalence of tobacco use at 16%, a sample size of 183 was calculated using the Epi Info™ version 3. All patients age must be 18 years and above, use of tobacco or betel nut duration significant and histopathology proven carcinoma were included. All patients age less than 18 years, betel nut or tobacco use not meeting the definition predefined, strong family or genetic predisposition to cancers, end of life or palliative care patients and histopathology indeterminate for carcinoma were excluded.

Specific focus was given to the use of tobacco and betel nut, including the form and duration of use, current status of use, reasons for not quitting, and timing of quitting relative to cancer diagnosis. Participants' awareness of the harmful effects of these substances was assessed with options ranging from not aware to fully aware. Detailed information on their cancer was also collected, including primary site, histological type, stage, grade, time of diagnosis, and functional class based on the ECOG scale. Additional sections explored participants' opinions on banning the sale of betel nut and tobacco, family history of cancer, and the impact of the diagnosis on family and friends who use these substances. Data entry, management, and analysis were performed using SPSS-19.0

RESULTS

Majority of the cancer patients in this study were female (73.2%) and predominantly from urban areas (77.0%). The average age of patients was 49.65 years. Ethnic distribution showed a significant representation of Muhajirs (42.6%), followed by Sindhi (14.8%) and other ethnic groups. A substantial portion of the patients were either illiterate (30.6%) or had only primary education (12.0%). Socioeconomically, nearly half of the patients (45.9%) belonged to the higher income bracket (>40,000 PKR) [Table 1].

Breast and reproductive cancers were the most common, making up 55.7% of the cases, while digestive tract and head and neck cancers each accounted for 14.8% of the cases. Adenocarcinoma was the predominant histological type (36.1%), followed by squamous cell carcinoma (18.0%). The cancer stages were fairly distributed across early (I and II) and advanced stages (III and IV), with a slight predominance of advanced stages (54.7%). The Eastern Cooperative Oncology Group (ECOG) performance status indicated that a majority of patients had a relatively good performance status (ECOG 0 and 1 accounted for 50.3%), 37.7% of patients reported a family history of cancer (Table 2).

A significant portion of patients (23.5%) reported using tobacco in some form, with betel nut being the most commonly used smokeless tobacco product (14.2%). The relatively low cigarette use (3.3%) and absence of Hukkah users are notable. The cessation rates post-cancer diagnosis was almost equal to the pre-diagnosis rates. However, 72.1% of patients supported a ban on tobacco products, reflecting a strong public health potential for legislative action against tobacco (Table 3).

Awareness of the hazards of tobacco was relatively high as shown in Table 4, with 56.8% being fully aware. Yet, significant portions (28%) either were not aware or were only partially aware of the hazards, pointing to the need for enhanced educational

campaigns. The majority opinion favoured a ban on tobacco products, suggesting public readiness for stricter tobacco control policies.

The reasons for tobacco use and impact of cancer diagnosis, addiction was the primary reason for continued tobacco use, followed by habitual use and social factors such as peer pressure and family habits. The diagnosis of cancer prompted some family members to reduce or cease tobacco use, although for many, it did not significantly impact their habits. This indicates the complexity of tobacco addiction and the need for robust cessation support mechanisms (Table 5).

Table 1: Sociodemographic characteristics of cancer patients (n = 183)

Characteristics	**Frequency (%)**
Age (Years)	49.65±14.55
Gender	
Male	49 (26.8%)
Female	134 (73.2%)
Ethnicity	
Sindhi	27 (14.8%)
Muhajirs	78 (42.6%)
Punjabi	18 (9.8%)
Balochi	20 (10.9%)
Pakhtoon	10 (5.5%)
Others*	30 (16.4%)
Education	
Illiterate	56 (30.6%)
Primary	22 (12.0%)
Secondary	30 (16.4%)
Intermediate	18 (9.8%)
Graduate	57 (31.1%)
Socioeconomic background (PKR)†	
<10,000	28 (15.3%)
10,000 – <20,000	28 (15.3%)
20,000 – <40,000	40 (21.9%)
>40,000	84 (45.9%)
Occupation	
Student	5 (2.7%)
Business	4 (2.2%)
Housewife	82 (44.8%)
Low/Unskilled	29 (15.8%)
Skilled	35 (19.1%)
Retired	1 (0.5%)
No Job	17 (9.3%)
Area of Residence	
Rural	42 (23.0%)
Urban	141 (77.0%)

PKR, Pakistani rupees, *Others' included Saraiki, Memon, Afghani, Aga Khani, Gilgiti, and Bengali, †Data were missing (3/183, 1.3%).

Table 2: Type of cancer, histological type, and functional status of study patients (n = 183)

Characteristics	**Frequency (%)**
Primary Site	
Genitourinary	6 (3.3%)
Central Nervous System	7 (3.8%)
Digestive	27 (14.8%)
Respiratory	7 (3.8%)
Endocrine	1 (0.5%)
Hematological	1 (0.5%)
Head and Neck	27 (14.8%)
Musculoskeletal	1 (0.5%)
Skin	1 (0.5%)
Reproductive	102 (55.7%)
Other Specific Sites	3 (1.6%)
Histological Type	
Adenocarcinoma	66 (36.1%)
Squamous	33 (18%)
Ductal and Lobular	13 (7.1%)
Mucinous	16 (8.7%)
Serous	3 (1.6%)
Lymphoma	3 (1.6%)
Others	27 (14.8%)
Cancer Stage‡	
I	34 (18.6%)
II	47 (25.7%)
III	58 (31.7%)
IV	42 (23.0%)
Family History of Cancer	69 (37.7%)
ECOG Performance Status	
0	67 (36.6%)
1	25 (13.7%)
2	39 (21.3%)
3	25 (13.7%)
4	26 (14.2%)

ECOG, Eastern Cooperative Oncology Group, ‡Data were missing: Cancer Stage (2/183, 1.1%) and ECOG Performance Status (1/183, 0.5%)

Table 3: Frequency of smokeless tobacco, cigarette, and betel nut use among cancer patients (n = 183)

Characteristics	**Frequency (%)**
Use of Tobacco	43 (23.5%)
Smokeless Tobacco	
Paan	14 (7.7%)
Naswar	5 (2.7%)
Gutkha	8 (4.4%)
Others	3 (1.6%)
Cigarette*	6 (3.3%)
Hukkah	-
Betel Nut†	26 (14.2%)
Current Status of Tobacco Use	

Quit	27 (14.8%)
Active Use	12 (6.6%)
Tobacco Cessation	
Pre-Diagnosis	16 (8.7%)
Post-Diagnosis	15 (8.2%)

*Of six patients, two patients reported 1 pack year, one patient each reported 2, 20, and 25 pack years, respectively, and one patient reported occasional cigarette smoking, †For 26 patients, betel nut use per day ranged from minimum of one packet per day to a maximum of 10 packets per day. Duration of betel nut use ranged from minimum of 4 years to a maximum of >40 years.

Table 4: Awareness of hazards and opinion regarding ban of tobacco products (*n*=183)

Characteristics	**Frequency (%)**
Awareness of Hazards*	
Not Aware	12 (6.6%)
Partially Aware	39 (21.3%)
Fully Aware	104 (56.8%)
Opinion regarding Ban of Tobacco Products	
Should not be banned	14 (7.7%)
Should be banned	132 (72.1%)

*Data were missing: Awareness of Hazards (28/183, 15.3%) and Opinion regarding Ban of Tobacco Products (37/183, 20.2%).

Table 5: Reason for using and not quitting tobacco products and opinion regarding impact of cancer diagnosis (*n* = 183)

Questions	**Responses**
What are the reasons for using tobacco products?	Addiction
	No specific reason
	Habitual
	Taste
	Helps in digestion
	Peer pressure
	Family member with smokeless tobacco and smoking habit
	Social gathering
	Perceived stress reliever
	Influence of media/ advertisement
	Because of occupation
What are the reasons for using tobacco products?	Addiction
	Social gathering
	Occasional use
	No awareness
	Don't know the reason
What is the impact of the diagnosis of cancer in family and friends on use of tobacco products?	Members of family stopped using tobacco products
	Family members who smoke can continue to do so
	No affect
	Diagnosis does not affect anything
	Friends and family started to cut off use of tobacco products
	Mental and financial disturbance in family

DISCUSSION

The global burden of cancer is immense, leading to approximately 9.7 million deaths in 2022 [6]. In Pakistan, the absence of comprehensive research and systematic data recording means that no cancer registry can accurately reflect the true extent of the issue, which poses a significant challenge for developing an effective health policy.[7]

Breast cancer is the most prevalent malignancy in Pakistan, followed by lip, oral, and colorectal cancers, according to global patterns.[8] Our study's findings are consistent with this, showing that reproductive cancers, including breast cancer, were the most common among our patients (55.7%). This was followed by cancers of the head and neck (oral and laryngeal) and the digestive tract (colon, esophageal, gall bladder, liver, rectal, pancreas, and stomach). However, our study had a larger proportion of female respondents, which could account for the higher rate of reproductive cancers observed.

The distribution of cancers by the TNM staging method among 7,760 analytical cancer patients at Shaukat Khanum Memorial Cancer Hospital and Research Centre (SKMCH&RC) in Lahore, Pakistan, showed varied stages of cancer at diagnosis. According to the Cancer Registry and Clinical Data Management Section, 1.3% of cases were Stage 0, 15.4% were Stage I, 26.1% were Stage II, 24.0% were Stage III, and 19.1% were Stage IV. Additionally, 3.6% of cases were unstageable, and 10.5% did not have an AJCC stage defined.[9] The distribution of cancer stages according to our study reveals a slight predominance of advanced stages (III and IV, 54.7%), suggesting delays in diagnosis and treatment initiation. This underscores the critical need for early detection programs and public awareness campaigns to facilitate timely medical intervention.

The study highlights a significant portion of patients (23.5%) using tobacco, with betel nut being the most commonly used smokeless tobacco product (14.2%). The low cigarette use (3.3%) contrasts with common perceptions and suggests a cultural preference for smokeless tobacco forms in this population. Interestingly, the cessation rates post-cancer diagnosis were almost equal to pre-diagnosis rates, indicating limited immediate impact of the diagnosis on quitting behavior. The points to the deep-seated nature of tobacco addiction and the necessity for robust cessation support.

Despite the continued use of tobacco, there is strong public support for a ban on tobacco products, 72.1% in favor, reflecting a readiness for legislative measures to curb tobacco use. According to the WHO Framework Convention on Tobacco Control, 85.8% of adults believe that smoking cigarettes cause serious illness, and 77% believe that smokeless tobacco has similar health risks.[10] Awareness of tobacco hazards is relatively high, with 56.8% of individuals being fully aware. However, a significant portion of patients, 28%, are either not aware or only partially aware, indicating a gap in public health education. Enhanced educational campaigns are crucial to bridge this gap and reinforce the health risks associated with tobacco use.

Numerous factors contribute to the prevalence and acceptance of smoking in Pakistan, including peer pressure, social requirements, and the desire to relieve anxiety, stress, anger, and frustration, along with the addictive nature of nicotine in cigarettes.[11,12] According to our study, addiction and social factors such as peer pressure and family habits emerge as primary reasons for continued tobacco use.[13] This finding underscores the importance of cessation programs that address these broader social influences in addition to addressing nicotine addiction.

The impact of a cancer diagnosis on tobacco use was mixed. While some family members reduced or ceased use, many continued, underscoring the complexity of tobacco addiction. This complexity necessitates multifaceted intervention strategies, including psychological support and community-based initiatives.

One key limitation of our study is the sample size which may not be representative of the broader cancers patient population, potentially limiting the generalizability of the findings. The reliance on self-reported data introduces the risk of biases, such as social desirability and recall biases, which could lead to inaccurate reporting of behaviors.

The findings highlight critical areas for public health intervention, including enhancing cancer awareness promoting early detection, and strengthening tobacco cessation programs. The high support for tobacco product bans among cancer patients suggests a societal shift that policymakers can leverage to implement stricter tobacco control measures.[14,15] Further studies are needed to assess the association between histological cancer types and different forms of tobacco use. Understanding these correlations could provide valuable insights into the underlying mechanisms linking tobacco exposure to cancer development and inform targeted prevention and treatment strategies.

CONCLUSION

Substantial prevalence of tobacco use among cancer patients, with a cultural preference for smokeless forms. The high level of awareness about tobacco hazards and strong support for a ban indicate potential for effective legislative measures. The study underscores the need for enhanced public health education and robust cessation support to address tobacco addiction and reduce cancer incidence.

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