

RISK FACTORS ASSOCIATED WITH HEAD AND NECK CANCER PATIENTS

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ABSTRACT: Head and Neck Cancers (HNCs) are the 2nd most common cancers in Pakistan. Both males and females have been victims of HNCs. The objective of the present study was to determine the association of the known risk factors like age, gender, socioeconomic status, toxic habits, organs involved, stage of cancer at presentation, occupational hazards, cast system and their effects on head and neck cancer prognosis. The study sample consisted of 200 patients belonging to different areas of the Punjab, Pakistan who visited/admitted to INMOL hospital, Lahore. The data was collected through in-person interview based on structured questionnaire. The results showed that the highest incidence rate of HNC (27%) was associated with 51-60 years of age and majority of the patients classified to middle (58.5%) income class. 93.5% cases had no family history of HNC or any other cancer. According to tumor, node and metastasis (TNM) staging system, 43% patients were at stage IV, trailed by 32.5% at stage III, 18% at stage II and 7.5% at stage I respectively. The toxic habits like chewing of smokeless tobacco, smoking, gutkha, betel quid and chalia were found associated with HNCs and the most affected organs were the tongue (22%) and larynx (18.5%). The association between HNC and occupation showed that 18.5% patients worked in factories where they might be exposed to risk hazards like cement, wood dust, formaldehyde, asbestos, benzene and coal. The results with respect to cast system showed that Jutt, Sheikh and Khan were affected (17.5%, 16% and 15%, respectively) more than any other cast. It was concluded that age, gender, cancer history, occupation, socioeconomic status, cancer staging, toxic habits and cast system were risk factors associated with Head and Neck Cancer.

Key words: Head and neck cancer (HNC), Risk factors, Toxic habits, Occupation and Cast system.

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INTRODUCTION

Malignancies of para-nasal sinuses, nasal cavity, oral cavity, pharynx and larynx come under squamous cell carcinomas and are commonly known as head and neck cancer (HNC) (Rossini *et al.*, 2008). The HNC is not restricted to any region and ranks 6th among all the cancers over the world with 630,000 new patients diagnosed every year causing about 350,000 deaths annually (Vigneswaran and Williams, 2014). In Canada, HNC is 5% of all the cancers and out of this 85% patients are victims of squamous cell carcinomas of oral cavity (Miller *et al.*, 2014). Squamous cell carcinoma of oral cavity is the most common cancer of mainland China, India, Sri Lanka and Taiwan (Garg *et al.*, 2014 and Ariyawardana *et al.*, 2007). American population has also been victim of HNC to a greater extent. In India HNC constitutes one third of all newly diagnosed cancers in contrast to 4-5% in developed countries (Shah *et al.*, 2016). Recent reports from American Cancer Society, Atlanta, 2012 have reflected that 7890 patients died of HNC in America. It is also reported that young Caucasian males become more victim to human papillomavirus (HPV) associated HNC than females (Marur *et al.*, 2010 and Sedrak and Rizzolo, 2009).

In Pakistan, HNC constitutes 21% of the cancers in men and 11% in women (Joshi *et al.*, 2014). Over the last thirty years HNC in males and breast cancers in females are escalating at higher rate in Punjab, Pakistan and the incidence rate is considered highest in Asia (Masood *et al.*, 2015). The highest incidence rate is reported from Sindh especially in Karachi followed by Multan in Punjab and the lowest incidence rate is recorded in Pashawar in the province of Khabar Pakhtoonkhwa (KP) (Cancela *et al.*, 2010).

The current reports indicate that Pakistan, India, Bangladesh, Srilanka, Thailand and Taiwan are the most affected Asian countries where HNC specifically the oral cancers are escalating more rapidly among the masses (Bhurgri *et al.*, 2006). The unusual increase is linked to the use of betel-quid (paan), tobacco, gutkha, cigarette, huqa and naswar which are adopted as a token of culture in these countries (Krishna *et al.*, 2014). HNC is most likely associated with widely distributed risk factors like use of tobacco in diverse forms, bidi, chalia, chewing of betel along with alcohol drinking and infections of human papillomavirus reported by (Lee *et al.*, 2012; Madani *et al.*, 2012 and Jayalekshmi *et al.*, 2011). The use of tobacco along with alcohol for a long time is considered

important in the development of HNC (Hashibe *et al.*, 2009).

In Pakistan, the highest rate of oropharyngeal cancer is recorded among Urdu-speaking communities (20.4%), followed by Balochis (19.9%), Sindhis (16.8%), Punjabis (11.7%) and Pashtuns (9.6%) (Bile *et al.*, 2010). Use of Gutkha and its association with human papilloma virus (HPV) infection lead to oral lesions which subsequently may develop in to squamous cell carcinoma of the oral cavity (Baig *et al.*, 2012). The toxic material like gutkha, paan masala, sipari with chalia are used profoundly by males and females in almost all cities of Pakistan which are considered main source of poor oral hygiene (Balaram *et al.*, 2002 and Madani *et al.*, 2012). Farmers, factory workers and labourers who remain outdoor for a longer period of the day and remain exposed to ultra violet rays, cement dust, formaldehyde, asbestos, wood dust, benzene and coal have high risk of HNC (Marur *et al.*, 2008 and Olshan *et al.*, 2010).

The objective of the present study was to determine the association of different risk factors in the development of HNC among patients visited/admitted to INMOL hospital Lahore during June, 2013-May, 2014.

MATERIALS AND METHODS

The present study was conducted at Institute of Nuclear Medicine of Oncology Lahore (INMOL) and University of Education, Lahore. The questionnaire based data was collected from 200 patients who were histologically positive for HNC.

The data was collected through interview based on questionnaire from the head and neck cancer patients. The data mainly pertained to the risk factors such as: (i) Socio-demographic factors including gender, marital status, age at diagnosis, level of education and socio-economic status. (ii) Family history regarding HNC or any other cancer (iii) Stage of HNC (iv) Life style habits: tobacco smoking, chewing of betel quid (pan), chaalia, pan masala, gutkha, smokeless tobacco and alcohol drinking.

Interviews were conducted at separate sitting places in the hospital with the consent of the patient. The patients were ensured about the secrecy of data and sufficient time was given to answer the questions. With the exception of few risk factors, all other factors had multiple choice responses like yes/ no or 1/2/3/4.

RESULTS

Percentage of male cases (60%) was fairly dominating the female cases (40%). Majority of the patients classified to middle (58.5%) and low income (39%) classes. The data further showed that 50% affected male and 70% female cases were classified as to middle

class. Similarly, 46.6% male and 27.7% female cases were categorized as to lower class. The patients categorized to upper classes were just less than 5%. It was observed that majority of the patients (77.5%) were from urban areas as compared to rural areas which constituted 22.5% of the total cases. The current study showed that 93.5% cases had no family history of head and neck/any other cancer (Table 1).

Age at diagnosis: Out of patient cases diagnosed with HNC showed, 17% patients belonged to 30-40 years of age, 25.5% to 41-50 years of age and 27% at 51-60 years of age. Moreover, 14% and 11.5% cases were diagnosed at 61-70 years and 71-80 years of ages respectively as shown in (Fig 1).

Head and neck cancer at different TNM Stages: Clinical data was classified into different stages as documented by the physicians. The results revealed that majority of the cases (43%) belonged to stage IV followed by stage III (32.5%), stage II (18%) and stage I (7.5%), respectively. The data further showed that 50% and 27.5% male cases were categorized to stage III and IV. But female patients (37.5% and 32.5%) were found at stage III and IV (Fig 2).

Distribution of patients with different organs involved: The most affected organ was the tongue (20% and 25%) in both males and females. Larynx was the most involved organ (26.6%) in males than any other organ in both sexes (Fig 3).

Distribution of patients according to toxic habits: The present data revealed that 55% patients were smokers whereas the female smokers were (5%). Only one male patient was found addicted to alcohol. The toxic habits like chewing of tobacco, naswar, paan, shisha, gutkha, chalia were more popular in males (15%) as compared to females (12.5%). When this data was related to organs involved in this cancer, tongue (22%) and larynx (18.5%) were found to be the main targets. Moreover, the results also reflected that 82.5% females had no adverse habits but most of the males (70.84%) were found addicted to such adverse habits (Fig 4).

Distribution of patients according to occupation: The relationship between HNC and occupation is shown in the Fig-5. Most of the patients classified to unskilled group (18.5 %) including labour. The next major affected group belonged to govt. servants (15%) and business men (15%).

Distribution of patients according to cast: The incidence rate of HNC among Jutt, Sheikh and Khan were noted as 17.5%, 16% and 15% respectively and were found to be the most affected casts. The Malik, Butt and Mughal had almost equal rate (7%) of HNC incidence. The total prevalence in other casts was recorded as 21.5% (Fig 6).

Table 1: Distribution of HNC cases according to social status, residential area and family history of cancer.

Variables	Categories	Male	%	Female	%	Total	%
Social status	Upper class	4	3.3	1	1.25	5	2.5
	Middle class	60	50	57	71.25	117	58.5
	Low class	56	46.5	22	27.75	78	39
Residential Area	Urban	87	72.5	68	85	155	77.5
	Rural	33	27.5	12	15	45	22.5
Family History of Cancer	Present	4	3.3	9	11.25	13	6.5
	Absent	116	96.6	71	88.75	187	93.5

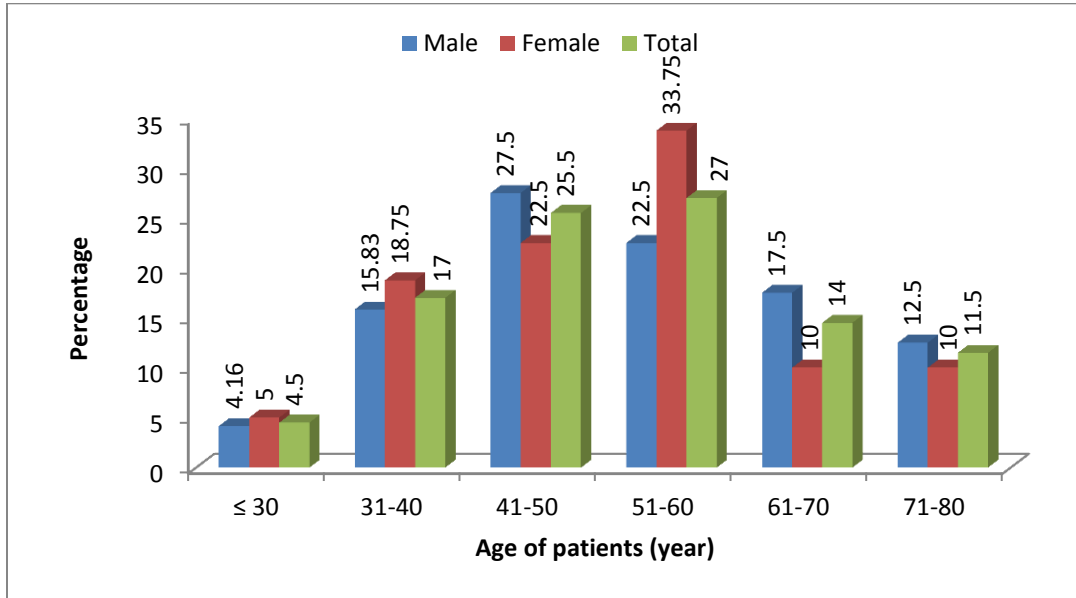


Figure 1: Age wise Distribution of HNC patients.

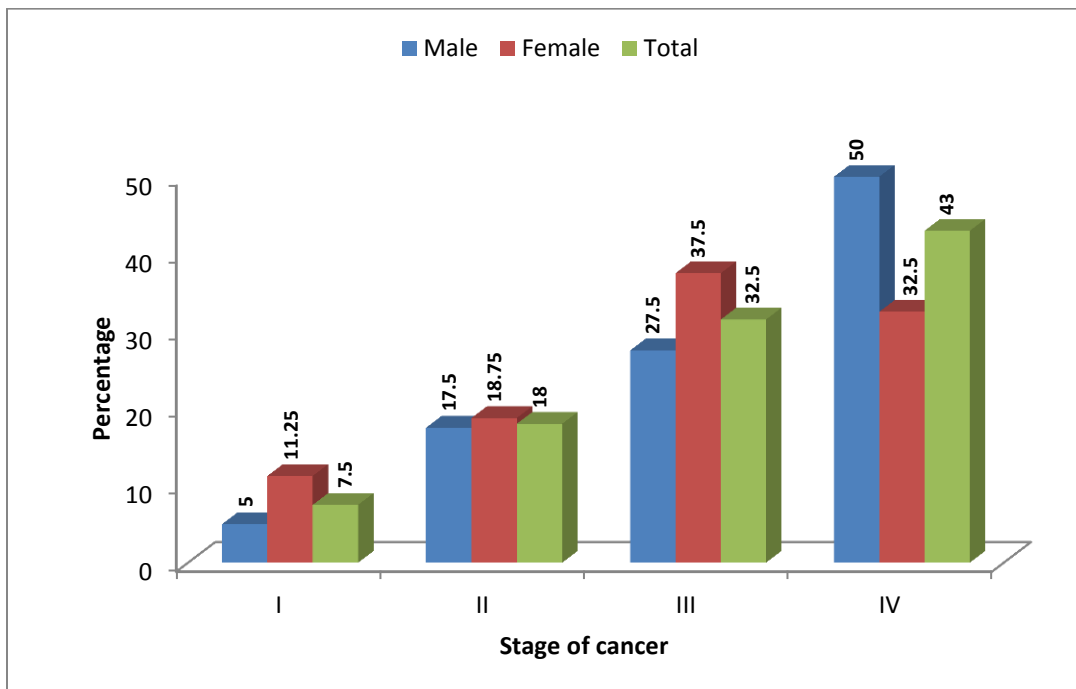


Figure 2: Distribution of HNC patients with respect to TNM stages.

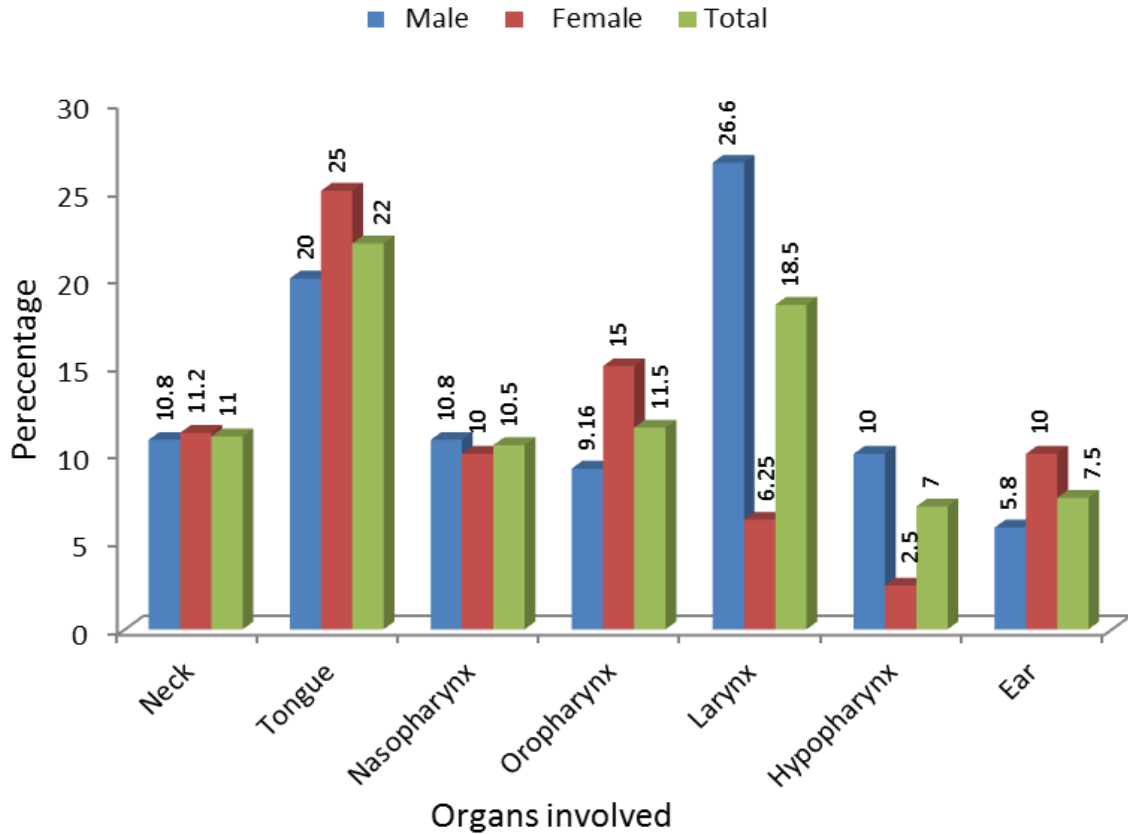


Figure 3: Distribution of HNC patients according to the organs involved.

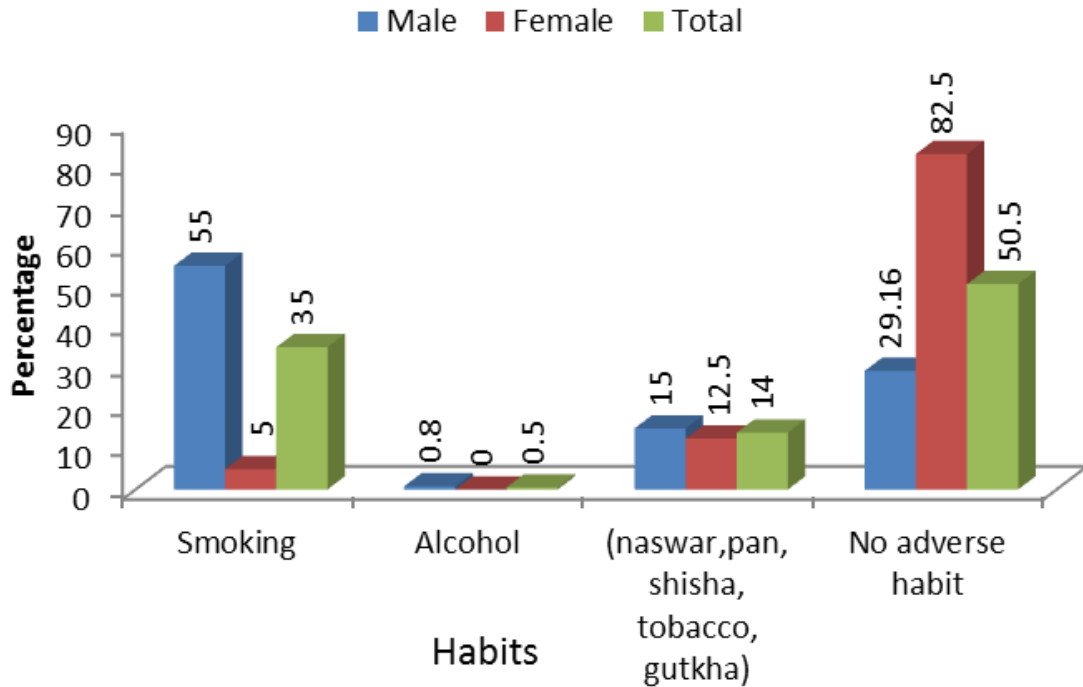


Figure 4: Distribution of HNC patients according to toxic habits.

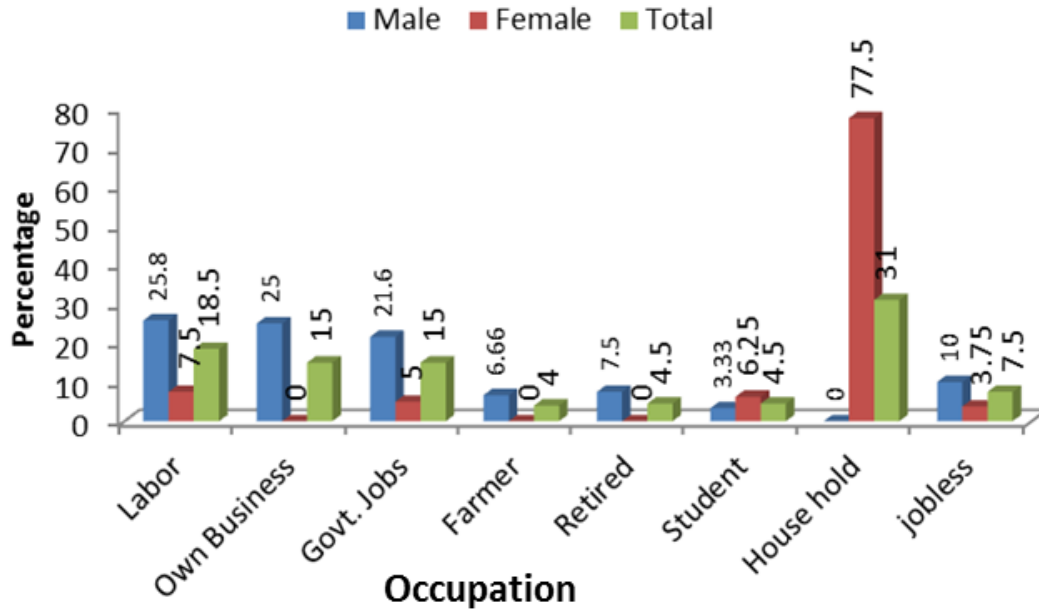


Figure 5: Distribution of HNC patients with respect to profession.

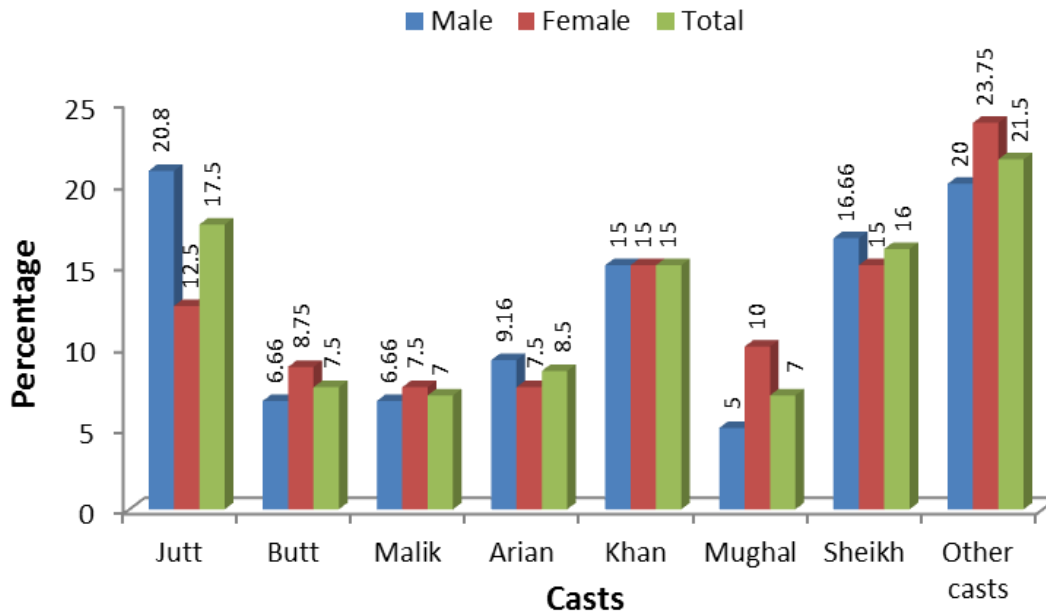


Figure 6: Distribution of HNC patients with respect to casts

DISCUSSION

In the present hospital-based retrospective study, prevalence of known risk factors of HNC and their association were studied among patients from different areas of Punjab who visited/admitted to INMOL, hospital Lahore.

The HNC is often regarded as a disease of the elderly, with patients being diagnosed predominantly in the sixth to eight decade of life (Kiran *et al.*, 2012). Our

data showed that HNC prevalence rate was substantially high (17%) in patients below 40 years of age and the youngest patient in the present study was of 7 years age. The current findings are in line with the findings of Robinson and Macfarlane, (2003) and Macfarlane *et al.*, (1992) who reported high incidence of HNC in young people of both sexes. Our results are in agreement with Halboub *et al.* (2011) who showed that 17% of the Yemeni patients living in Saudi Arabia, were below 40 years. Present study showed that 52.5% patients belonged

to middle age group (41-50 and 51-60 years). These findings are supported by the results reported by Saraswathi *et al.* (2006) and Kiran *et al.* (2012) in India where majority of the patients of oral cancer were between the ages of 40-60 years.

Among all age groups, the incidences of HNC cases were more prevalent in males (60%) than those of female (40%). Our study is consistent to reports of Masood *et al.*, (2015) and Agrawal and Rajderkar, (2012) who had described similar results. In Pakistan, from 1994-2013, there were 1336 HNC cases of female and 2195 of male patients (Cancer Registry of SKMH). Our study showed that 39% patients belonged to low level of income. These findings are in agreement with Madani *et al.* (2010) who reported that socioeconomic status and level of education was inversely proportional to the occurrence of HNC. Low socioeconomic status, less use of fruits and vegetables were critical risk factors for oral cancer (Madani *et al.*, 2012 and Hosseinpoor *et al.*, 2012).

Our results indicated that 14% patients had multiple habits of taking intoxicants like tobacco chewing, shisha, naswar, pan and gutkha and hence established a serious link between toxic habits and HNC. Our findings are in line with Shah *et al.* (2012) who reported an intimate relationship between oral cavity cancer and betel quid. Some reports from Indian states indicated that tobacco chewing and keeping tobacco in mouth for different durations had emerged as major risk factor of oral cancer (Madani *et al.*, 2012). This difference in practicing the toxic habits corresponds to different geographic and demographic factors. It was observed that in our culture naswar and paan were the two main culprits, mostly prevalent in Karachi, South Punjab, Lahore and the northern parts of Pakistan. Our data reflected that there were overall 49.5% patients with toxic habits and this rate was quite low than the reports of Aruna *et al.* (2011) and Patil *et al.* (2013) where toxic habits accounted for 93.5% among patients of oral cavity cancer.

The current study revealed that 25.8% males belonged to unskilled group and some of them had been exposed to different kinds of carcinogenic agents like asbestos, formaldehyde and wood dust. These findings are supported by Alonso-Sardón, (2015) who documented that wood dust was a critical risk factor for HNC.

The present study showed that the most common sites affected by HNC were neck (11%), tongue (22%), larynx (17.5%), oropharynx (11.5%), and nasopharynx (10.5%) among patients. The leading anatomical site involved in HNC appeared tongue in the present study. The results were in agreement to the reports of Addala *et al.* (2012) and Bektas-Kayhan *et al.* (2014) in India where tongue was the most affected area due to tobacco, chalia and betel quid chewing.

The classification of cancer in to TNM stages is considered the most important in its treatment. HNC patients are clinically stratified into four different stages (I, II, III and IV) on the basis of tumor, node and metastasis (TNM) classification of the American Joint Committee for cancer staging (Compton *et al.*, 2012). The present study showed that 74.5% of patients were stratified into stage III and IV indicating that they were not aware of the symptoms, hygienic condition and the risk factors of the disease. The data was well in line with the reports of Krishna *et al.* (2014) who reported similar prevalence with respect to TNM stages in Indian population.

It is common observation that some casts in Punjab are vulnerable to cancers. In this context, the highest prevalence rate was found in Jutts followed by Sheikhs and Khans. When the present data was related with risk habits, then Khans were at high risk of HNC because of their cultural habits of using naswar and smokeless tobacco. The Jutt and Sheikh had also inclination towards using betel quid, pan, naswar and hence fell in to high risk profile. The other casts in Punjab like Malik, Butt, Arian and Mughal were found to be victim of HNC with similar rate of prevalence (Fig 6).

Our results revealed that there was an alarming increase in the incidence of HNC especially among the younger people of both sexes. The male population at large is exposed to different toxic agents during their working hours and are involved in toxic habits. Poverty and illiteracy leads to the development of unhygienic environment which promotes diseases. Presently, there is a dire need to create awareness in the public about risk habits and early detection of HNC. It will not only help in developing risk free environment but also enhance the survival rate of the patients.

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