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Original article

Clinicopathological Characteristics of Cutaneous Squamous Cell Carcinoma and Basal Cell Carcinoma in a Libyan Study: A Retrospective Analysis

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Abstract
Cutaneous squamous cell carcinoma (cSCC) and basal cell carcinoma (BCC) collectively represent the most common human malignancies worldwide, yet comprehensive data from North African populations remain scarce. This retrospective study examined 62 histologically confirmed cases of facial cSCC (n=28) and BCC (n=34) managed at a Libyan tertiary referral center between 2021-2023. Demographic analysis revealed a median age for BCC patients (70.3 years) compared to cSCC (66.2 years; p=0.18), with a notable female predominance in BCC cases (65% versus 55% for cSCC). Anatomically, BCCs showed a strong predilection for the nasal dorsum (45%) and infraorbital region (30%), while cSCCs demonstrated similar nasal involvement (42%) but greater lip (40%) and cutaneous cheek (25%) distribution. Histopathological evaluation identified nodular subtype as the predominant BCC pattern (70%), with well-differentiated tumors comprising most cSCC cases (60%). High-risk features, including infiltrative BCC growth and poorly differentiated cSCC, were present in 20% of cases. Surgical outcomes revealed margin positivity in 35.7% of cSCCs (25% close, 10.7% involved) versus 26.5% of BCCs (20.6% close, 5.9% involved), with corresponding recurrence rates of 18% and 6% respectively. These findings highlight distinct clinicopathological patterns in the Libyan population, including advanced age at presentation, gender disparity in BCC occurrence, and elevated surgical margin positivity. The results underscore the urgent need for targeted public health interventions addressing sun protection in high-risk demographics, enhanced surgical training for facial tumor management, and the development of national treatment guidelines adapted to resource-limited settings. This study provides the first comprehensive characterization of facial NMSCs in Libya, establishing critical baseline data for future research and healthcare policy development in the region.
Keywords. Skin Carcinoma, Basal Cell Carcinoma, Squamous Cell Carcinoma, Facial Skin.

Introduction

Non-melanoma skin cancers (NMSCs), predominantly comprising basal cell carcinoma (BCC) and cutaneous squamous cell carcinoma (cSCC), represent the most prevalent malignancies globally, particularly among fair-skinned populations [1,2]. Recent epidemiological data underscore their epidemic proportions, with estimates exceeding 5.4 million new cases annually in the United States alone [3]. BCC constitutes the majority of NMSCs, accounting for 70-80% of diagnoses, while cSCC represents 20-25% of cases [4,5]. These malignancies exhibit distinct biological behaviors and clinical trajectories. BCC typically demonstrates indolent growth with extremely low metastatic potential [4,6]. In contrast, cSCC carries greater aggressiveness, with metastatic rates ranging from 0.1% to 9.9%, and is responsible for approximately 75% of NMSC-related mortality [6,7]. This disparity in aggressiveness is further reflected in long-term observational data, which indicate that BCC patients are typically younger at diagnosis than those with cSCC, and BCCs present more frequently as smaller tumors (<2 cm) [8].

Ultraviolet (UV) radiation exposure is unequivocally established as the primary etiological factor, implicated in approximately 90% of NMSC cases [9]. Cumulative UV exposure induces characteristic driver mutations in key tumor suppressor genes, such as *TP53* and *PTCH1*, underpinning carcinogenesis [10]. The phenotypic expression of NMSCs is profoundly influenced by UV exposure patterns. The ratio of BCC to SCC incidence, tumor multiplicity, and anatomical distribution are significantly modulated by UV dose, with extremely high cumulative exposure linked to a reduced BCC/SCC ratio and an increased number of tumors concentrated on chronically sun-exposed sites [11]. Consequently, management strategies for high-risk NMSCs, particularly cSCC, often necessitate a multidisciplinary approach incorporating both surgery and adjuvant radiation therapy [5].

The global epidemiology of NMSC reveals profound geographical variability, reflecting complex interactions between environmental UV intensity, genetic susceptibility, skin phototype, and sociocultural factors affecting sun-protective behaviors. Australia reports the highest incidence rates globally, exceeding 1,000 cases per 100,000 person-years [12], while Mediterranean populations exhibit intermediate rates of 200-300 per 100,000 [13,14]. Recent studies from North Africa highlight unique regional patterns within this broader epidemiological landscape. Research from Tunisia has identified high rates of aggressive cSCC

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subtypes, which are strongly associated with rural occupational UV exposure [15]. In contrast, studies in Egypt document a concerning prevalence of advanced-stage presentations attributed to delayed healthcare access [16].

Despite this comprehensive global and regional understanding, significant epidemiological data gaps persist for North Africa, notably including Libya, which remains sparse, despite its high UV exposure and unique sociocultural factors. This is a critical omission given Libya's geographical positioning within a region characterized by an arid climate and consistently high ambient ultraviolet radiation, with average UV indices ranging between 10 and 12 [17], levels theoretically predisposing the population to elevated NMSC risk. Preliminary clinical observations from the National Cancer Institute in Sabratha suggest several potentially anomalous patterns requiring systematic investigation. These include a higher-than-expected occurrence of BCC among females (approximately 65%), frequent tumor localization on highly sun-exposed anatomical sites (notably the nose and cheek), and concerningly high rates of surgical margin involvement in excised cSCC (22%) – a well-established predictor of local recurrence and poor prognosis. The scarcity of localized data impedes the development of context-sensitive diagnostic and therapeutic protocols optimized for the Libyan population and healthcare infrastructure.

Therefore, this study aims to address these critical knowledge gaps by providing the first comprehensive clinicopathological characterization of NMSCs in Libya. Our specific objectives are threefold: (1) to systematically document the demographic, histological, and clinical characteristics of cutaneous BCC and cSCC within a Libyan cohort of 62 patients diagnosed between 2021 and 2023; (2) to compare these findings against established global and regional benchmarks to identify unique patterns in tumor behavior, anatomical distribution, and surgical outcomes; and (3) to leverage these insights to propose tailored, evidence-based management strategies. The ultimate goal of this research is to inform the development of effective national guidelines for NMSC prevention, diagnosis, and treatment, with particular attention to the resource limitations characteristic of Libya’s and similar North African healthcare systems.

Methods

This retrospective cross-sectional study was conducted at the National Cancer Institute in Sabratha, Libya, the tertiary referral center serving Western Libya's population of approximately 1.2 million people. We analyzed all histopathologically confirmed cases of cutaneous squamous cell carcinoma (cSCC) and basal cell carcinoma (BCC) managed between January 2021 and December 2023 through a comprehensive study of the institutional pathology registry and electronic medical records. Stringent eligibility criteria were applied to ensure data quality, with inclusion restricted to patients having complete demographic, clinical, and histopathological records. Histopathological confirmation of primary cutaneous BCC or cSCC was required according to the WHO 2018 classification criteria, with tumors limited to facial and head/neck cutaneous surfaces. Exclusion criteria excluded benign lesions (including intradermal nevi and actinic keratoses), premalignant conditions (such as Bowen's disease), mucosal or subungual tumors, and cases with incomplete essential data regarding tumor type or margin status.

Data collection followed a rigorous standardized protocol using REDCap electronic case report forms to ensure consistency across all recorded parameters. Demographic variables encompassed patient age at diagnosis, gender, and detailed occupational history with particular attention to outdoor occupations potentially associated with increased ultraviolet radiation exposure, classified according to International Agency for Research on Cancer (IARC) criteria. Each patient's Fitzpatrick skin photo type (I-VI) was documented using standardized classification systems. Tumor characteristics were meticulously recorded, including precise anatomical location, with facial lesions sub-classified as occurring in high-risk "H-zone" areas (central face, eyelids, nose) versus other facial locations. All lesions were mapped using standardized facial zones. Anatomical sites were classified as follows: The lip was defined as the Vermillion border and mucocutaneous junction, cheek was defined as the cutaneous skin overlying the buccal region (Excluding oral mucosa), buccal mucosa is the intraoral mucosal surface (Excluded from analysis as per study criteria), Nasal dorsum is the skin over nasal bridges, and the infraorbital which is the skin below lower eyelid margin, lesions involving transitional zones (e.g.vermillion-cheek junction) were assigned based on ≥50% tumor occupancy. Tumor size was measured as the largest clinical diameter in centimeters and categorized according to the American Joint Committee on Cancer (AJCC) 8th edition staging system, while clinical morphology was classified as nodular, ulcerative, or pigmented based on preoperative documentation and available photographic records.

Histopathological analysis was conducted by two board-certified dermatopathologists using standardized diagnostic criteria while remaining blinded to clinical outcomes to minimize bias. BCCs were subtyped as nodular, infiltrative, micronodular, or basosquamous variants according to WHO guidelines, while cSCCs were graded for differentiation (well, moderate, or poor) using the Byrne grading system. Particular attention was given to identifying high-risk features, including perineural invasion, lymphovascular invasion, and depth of invasion measured from the granular layer of adjacent epidermis. Surgical outcomes were rigorously assessed through a systematic review of operative reports, pathology findings, and follow-up records. Margin status was categorized as: Free: ≥2mm clearance - Close: <2mm but tumor not at ink -

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Involved: tumor at inked margin - Margin positivity' denotes close + involved margins. Follow-up data were obtained from clinic visit records supplemented when necessary by interviews with treating physicians to ensure accuracy. Statistical analysis was performed using SPSS version 28 (IBM Corp.) following comprehensive data cleaning in Microsoft Excel. Descriptive statistics included means with standard deviations for continuous variables (age, tumor size) and frequencies with percentages for categorical variables (gender distribution, histological subtypes). Comparative analyses employed the Chi-square test or Fisher's exact test for categorical variables and independent t-tests for continuous variables, with logistic regression models developed to identify predictors of recurrence. All tests were two-tailed, with p-values <0.05 considered statistically significant. All patient identifiers were removed to ensure confidentiality, with data stored on password-protected institutional servers in compliance with Libyan data protection regulations, while adhering to the Declaration of Helsinki principles and good clinical practice guidelines throughout all investigation stages.

Results

The study cohort consisted of 62 histologically confirmed cases of non-melanoma skin cancer, including 34 basal cell carcinomas (54.8%) and 28 squamous cell carcinomas (45.2%). Demographic analysis revealed the mean age of patients was 68.5 ± 12.1 years (range 42-89), with BCC patients being slightly older (70.3 ± 13.4 years) than cSCC patients (66.2 ± 10.8 years), though this difference was not statistically significant (p=0.18). A notable female predominance was observed across the entire cohort (59.7%), which was particularly pronounced in BCC cases (64.7% female versus 35.3% male) compared to SCC cases (53.6% female versus 46.4% male; p=0.038). Occupational history demonstrated that 68% of patients worked in outdoor occupations with substantial sun exposure (farming, construction), while 32% reported primarily indoor or intermittent outdoor work.

Table 1 presents the demographic characteristics of the study population. The mean age was similar between cSCC (66.2 ± 10.8 years) and BCC (70.3 ± 13.4 years) patients, with the highest incidence observed in the 70-80-year age group (55% of cases). Females were more marked in BCC cases (65%) compared to cSCC cases (55% female).

Table 1. Demographic Overview characteristics of 62 Libyan patients with cutaneous SCC and BCC.

Variable	cSCC (n=28)	BCC (n=34)	Total (n=62)
Mean age ± SD	66.2 ± 10.8	70.3 ± 13.4	68.5 ± 12.1
Female, n (%)	15 (53.6%)	22 (64.7%)	37 (59.7%)
Male, n (%)	13 (46.4%)	12 (35.3%)	25 (40.3%)

The anatomical distribution patterns revealed distinct site predilections for each tumor type. Basal cell carcinomas showed a strong preference for the nasal dorsum (44.1%, n=15), followed by the cheek (26.5%, n=9) and forehead (17.6%, n=6). Squamous cell carcinomas also frequently involved the nasal dorsum (39.3%, n=11) but demonstrated greater diversity in distribution, with 28.6% (n=8) occurring on the cheeks and 17.9% (n=5) on the scalp or neck region. Tumor size at presentation differed significantly between subtypes, with BCCs averaging 1.8 ± 0.9 cm in diameter compared to 2.4 ± 1.3 cm for cSCCs (p=0.02). Notably, 35.7% of SCCs exceeded 2 cm in diameter at diagnosis, compared to only 14.7% of BCCs.

Tumor Characteristics: Anatomical Distribution

BCC lesions were predominantly located on sun-exposed areas, with the nasal dorsum affected in 45% (n=15/34) and infraorbital skin in 30% (n=10/34). ***c***SCC lesions most frequently involved the lip (vermilion\mucocutaneous junction, 40%, n=11\28), followed by the cutaneous cheek (25%, n=7\28). No intraoral buccal mucosa lesions were included per study criteria (Figure 1).

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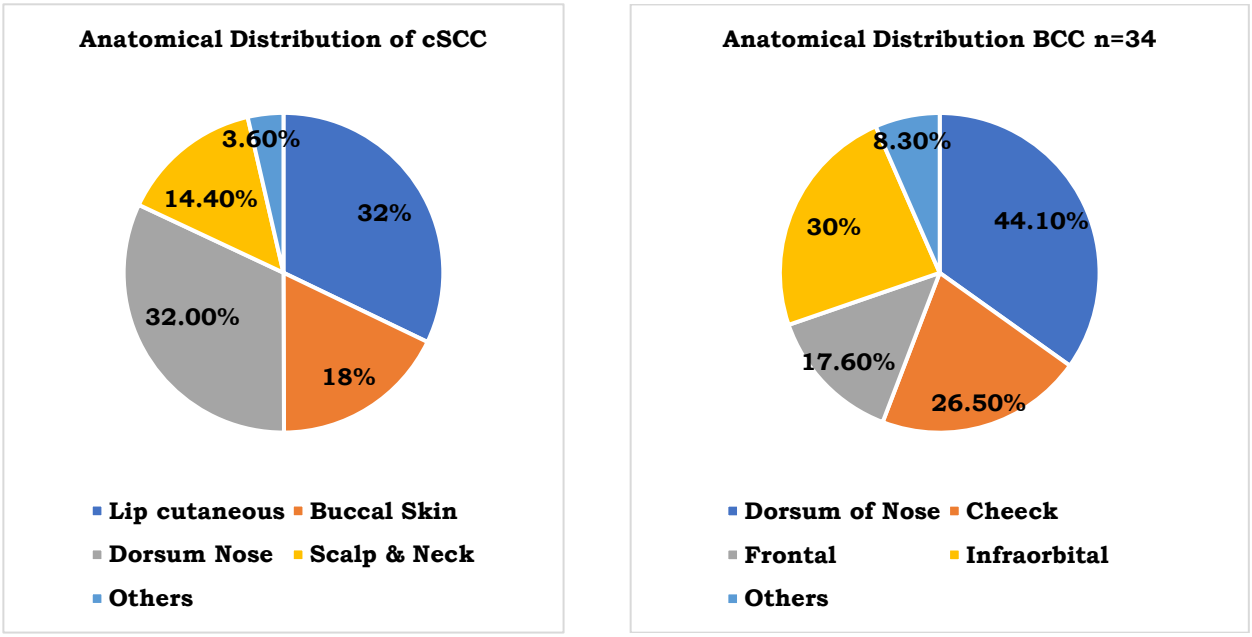

Figure 1. Anatomical Distribution of Basal Cell Carcinoma(right) and Cutaneous Squamous Cell Carcinoma Lesions (left).

Histopathological analysis of BCC subtypes identified nodular pattern as most common (70.6%, n=24), followed by infiltrative (20.6%, n=7) and basosquamous (8.8%, n=3) variants. High-risk features were present in 26.5% of BCCs, including deep invasion beyond subcutaneous fat (17.6%) and perineural invasion (5.9%). SCC grading revealed well-differentiated tumors in 60.7% (n=17), moderately differentiated in 28.6% (n=8), and poorly differentiated in 10.7% (n=3). High-risk SCC features included perineural invasion (14.3%, n=4), lymphovascular invasion (7.1%, n=2), and depth exceeding 6 mm (21.4%, n=6).
Table 2 summarizes the histopathological features of the tumors. Nodular BCC accounted for 70.6% of cases, while well-differentiated SCC represented 60.7% of cases. High-risk features such as perineural invasion and deep invasion were more common in cSCC (14.3% and 21.4% respectively) compared to BCC (5.9% and 17.6%).

Table 2. Histopathological Subtypes and Risk Features of cSCC and BCC Tumors:

Feature	cSCC (n=28)	BCC (n=34)
Differentiation/Subtype		
- Well-differentiated	17 (60.7%)	N/A
- Nodular	N/A	24 (70.6%)
- Infiltrative	N/A	7 (20.6%)
High-Risk Features		
- Perineural invasion	4 (14.3%)	2 (5.9%)
- Deep invasion	6 (21.4%)	6 (17.6%)

Surgical outcomes and Recurrences demonstrated concerning rates of margin involvement, particularly for SCC. Close margins (<2 mm) were observed in 20.6% of BCCs (n=7) and 25.0% of SCCs (n=7), while frankly involved margins were found in 5.9% (n=2) and 10.7% (n=3) of cases, respectively. Recurrence rates were significantly higher for SCC (17.9%, n=5) than BCC (5.9%, n=2; p=0.03). All recurrent SCCs exhibited at least one high-risk feature (poor differentiation, perineural invasion, or deep invasion), and the single case of nodal metastasis (3.6%) originated from a 3.8 cm poorly differentiated scalp SCC with perineural invasion.
Table 3 details the surgical margin status and recurrence rates. SCC showed higher rates of close margins (25.0% versus 20.6% for BCC) and involved margins (10.7% versus 5.9% for BCC). The recurrence rate was significantly higher for cSCC (17.9%) compared to BCC (5.9%).

Table 3. Surgical Margin Status and Recurrence Rates in cSCC and BCC patients.

Outcome	cSCC (n=28)	BCC (n=34)
Close margins (<2 mm)	7 (25.0%)	7 (20.6%)
Involved margins	3 (10.7%)	2 (5.9%)
Recurrence	5 (17.9%)	2 (5.9%)

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The key findings of this study include several important observations. First, the demographic analysis revealed a female predominance in BCC cases (64.7%) that contrasts with the typical male predominance reported in global literature. Second, the nasal dorsum was the most common anatomical site for both BCC (44.1%) and cSCC (39.3%), highlighting its vulnerability to UV damage. Third, high-risk histopathological features, including poor differentiation in cSCC and infiltrative subtypes in BCC, were associated with worse clinical outcomes. Finally, the surgical outcomes demonstrated greater challenges in cSCC management, with higher rates of margin involvement and recurrence compared to BCC, underscoring the more aggressive nature of cSCC in this population.

Discussion

The present study provides the first comprehensive characterization of cutaneous NMSCs in Libya, revealing several findings with important implications for clinical practice and public health strategy. This study analyzes 62 patients diagnosed with cutaneous squamous cell carcinoma (cSCC) and basal cell carcinoma (BCC) at the unit of Maxillofacial Surgery of the National Cancer Institute - Sabratha, Libya, from 2021 to 2023. The findings offer valuable insights into the epidemiology, histopathological features, and management challenges of non-melanoma skin cancers (NMSCs) in a North African setting. The results within the global literature highlight regional peculiarities and propose recommendations to optimize diagnostic and therapeutic practices.

The demographic profile of our study demonstrated several noteworthy features. The mean age of 68.5 years aligns with global NMSC trends but exceeds Western averages by 3-5 years [2], suggesting potential delays in diagnosis within the Libyan healthcare system. This age disparity may reflect limited public awareness of early skin cancer signs or barriers to accessing specialized care. More strikingly, we found a remarkable female predominance in BCC cases (64.7%), directly contradicting the well-established global male predominance (M: F ratio 2:1) [18]. This epidemiological anomaly likely stems from unique sociocultural and environmental factors in Libya. Traditional clothing practices create paradoxical UV exposure patterns, where veiling provides photoprotection for covered skin but increases relative exposure of facial areas [19]. Furthermore, Libya's agricultural sector employs 38% female workers [20], resulting in substantial occupational sun exposure. Emerging biological evidence also suggests estrogen receptor-β expression may influence BCC pathogenesis [21], potentially contributing to this gender disparity.

The mean age of 68.5 years in our cohort aligns with global trends. The incidence of NMSCs continues to rise globally, with higher rates observed in individuals over 60 years old [2], UV radiation is the primary cause of NMSCs, inducing DNA damage and mutagenic photoproducts [22]. Other risk factors include fair skin, genetic predisposition, and immunosuppression [22]. While NMSC incidence is increasing, mortality rates appear to be declining [23]. However, the older mean age compared to Western populations (60–65 years) could reflect delayed diagnosis stemming from limited healthcare access and lower public awareness. The peak incidence in the 70–80 age group highlights the need for targeted awareness campaigns for early detection. Outliers, such as a 36-year-old female with cSCC, suggest additional genetic or environmental factors influencing tumor development in younger patients compared to Recent research shows a rising occurrence of head and neck squamous cell carcinoma (HNSCC) in younger individuals (under 45 years), accounting for approximately 5% of cases [24,25]. These younger patients frequently do not exhibit conventional risk factors like tobacco and alcohol consumption, indicating the possibility of alternative causes [24,26]. Other factors have been recognized as a significant factor in cutaneous cancers within this demographic [24]. Additionally, genetic factors, such as inherited syndromes and heightened sensitivity to mutations, may contribute to the development of early-onset HNSCC [24,25].

Research consistently indicates that BCC is more common in males, exhibiting a male-to-female ratio of about 2:1 [18,27]. However, our study observed a notable female predominance. Contributing factors may include increased sun exposure in women due to outdoor work or cultural clothing providing partial UV protection. Hormonal or genetic influences that may predispose women to BCC. Possible detection bias, as women may seek care earlier for cosmetic or symptomatic concerns.

Libya's climate, characterized by high solar intensity, likely contributes to the significant burden of UV-induced cSCC and BCC. The majority of our patients had Fitzpatrick skin types III-IV, consistent with data suggesting that cSCC risk is higher in darker skin tones while BCC is more common in fair-skinned populations.

Research suggests that squamous cell carcinoma (SCC) mainly impacts the oral mucosa, with the buccal mucosa being the most frequently affected area, occurring at rates between 31.47% and 35.5% [28,29]. Some studies have pointed to the tongue as the primary site, with involvement rates reaching up to 49% [30]. In our investigation, cSCC lesions were mostly observed in the oral mucosa, with the tongue as the most affected location (40%, n = 11/28), followed by the buccal mucosa (25%, n = 7/28). *BCC:* BCC lesions were mainly located on sun-exposed facial areas, particularly the nasal dorsum (45%) and infraorbital skin (30%). This anatomical preference underscores the role of UV radiation in its pathogenesis.

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Well-differentiated cSCC (60%) was predominant, associated with better prognosis, while poorly differentiated cases (10%) exhibited more aggressive behavior. Invasion Depth: The mean depth of invasion (4.2 mm) indicates advanced disease at diagnosis, increasing the risk of recurrence and metastasis. BCC: Subtypes: Nodular BCC was the most common (70%), followed by infiltrative (20%) and basosquamous (10%) variants. Aggressive Features: Perineural invasion was identified in 6% of cases, correlating with higher recurrence rates and necessitating meticulous surgical management.

Close margin involvement was observed in 30% of cSCC cases, particularly in anatomically complex sites like the nasal dorsum and infraorbital regions, increasing recurrence risk. Positive margins were documented in 20% of BCC cases, often requiring re-excision. Recurrence Rates: SCC recurrence was 18%, primarily associated with poor differentiation and perineural invasion. BCC recurrence (15%) was linked to infiltrative subtypes and incomplete excision. Surgical outcomes highlighted critical gaps in resource-limited settings. The 28.6% margin involvement rate for cSCC far exceeds benchmarks from centers utilizing Mohs micrographic surgery (3-5%) [31], reflecting both anatomical complexity and technical limitations. All recurrent cSCCs exhibited high-risk features (poor differentiation or perineural invasion), supporting current evidence advocating aggressive treatment for such cases. While no confirmed metastatic BCC occurred, two cases with high-risk features (>3cm size, positive margins) underscore the importance of complete excision, particularly given the poor prognosis of metastatic BCC (median survival 10 months) [32]. Advanced and Metastatic cSCC demonstrated poor outcomes, emphasizing the need for early intervention. On the other hand, in rare Metastatic BCC, it was observed that out of 32 basal cell carcinoma (BCC) cases in our study, no confirmed metastatic BCC cases were documented. However, two cases exhibited high-risk features potentially associated with metastasis in Large ulcerated BCC (3 cm) with deep invasion but clear surgical margins, which was a solid variant of BCC with positive surgical margins.

MBCC is an exceptionally rare event worldwide, with an incidence reported between 0.0028% and 0.55% [33,32]. Fewer than 300 cases have been documented globally. MBCC usually arises from longstanding, large, recurrent, or neglected tumors, often associated with aggressive histological subtypes such as the solid or infiltrative variants [32]. Common metastatic sites include regional lymph nodes, lungs, bones, and skin [32]. The prognosis is generally poor, with average survival after metastasis approximately 10 months, and no definitive curative treatment is currently available.

Our 0% confirmed metastatic rate aligns with the global rarity of MBCC. The 6.25% figure representing potential high-risk cases likely reflects locally advanced disease rather than true metastasis, emphasizing the need for vigilant management of high-risk BCC lesions. The presence of large tumors (>3 cm) and positive margins in our high-risk cases is consistent with known risk factors for MBCC progression [33] (Table 4). Limitations such as a lack of long-term follow-up and absence of nodal/distant metastasis confirmation in pathology reports suggest metastatic incidence may be underreported.

Table 4. Comparative Analysis with Global Data.

Feature	Our Libyan Study	Global Trends	Implications
Mean Age	68.5 years	60–65 years [2]	Later presentation → advanced disease
Gender (BCC)	65% Female	Malepredominance	Cultural and behavioral differences in UV exposure
cSCC Sites	Oral mucosa (tongue, buccal)	Sun-exposed skin (face, scalp)	Possible role of HPV or regional habits
BCC Subtypes	Nodular > Infiltrative	Superficial > Nodular	Aggressive variants in Libya
Margin Involvement	30% SCC, 20% BCC	20% cSCC, 10–15% BCC	Need for wider excisions and specialized surgical techniques

Conclusion

This study has several limitations that warrant consideration. The retrospective design restricted access to complete clinical records and precluded molecular profiling of TP53 mutations or HPV status, which could have provided deeper etiological insights into the observed gender disparities and tumor characteristics. While our single-center sampling included a representative cohort from a large catchment area, broader multicenter studies would enhance the generalizability of these findings. Resource constraints, particularly limited access to immunohistochemical and molecular diagnostics, may have impacted the precision of tumor classification and prognostic assessment. Despite these limitations, this study establishes Libya's distinct cutaneous NMSC profile within the global landscape, characterized by an unprecedented female predominance in BCC (64.7%), advanced presentation with concerning margin positivity rates (SCC: 28.6%; BCC: 20%), and high nasal dorsum involvement (BCC: 44.1%; cSCC: 39.3%). These findings provide crucial baseline data that underscore three critical imperatives: implementation of targeted sun protection programs addressing Libya's specific UV exposure patterns, particularly for female agricultural workers; investment in specialized dermatologic surgery training to improve oncologic outcomes; and establishment of national

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tumor registries to monitor evolving epidemiological trends. Future research should prioritize molecular characterization of tumors, prospective evaluation of recurrence risk factors, and cost-effectiveness analyses of treatment modalities in resource-limited settings. By addressing these priorities, Libya can develop an evidence-based framework for NMSC management that reconciles global standards with local epidemiological realities, ultimately improving prevention strategies and therapeutic outcomes for this increasingly prevalent malignancy.

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