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ORIGINAL ARTICLE

# Skin cancer in a public tertiary hospital in Manila, Philippines from 2015 to 2019: A retrospective study

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## ABSTRACT

**INTRODUCTION** The true incidence of skin cancer, as well as the clinico-demographic and histopathologic profile of skin cancer patients in the Philippines, has not been established. To the authors' knowledge, no similar studies have been published in recent years.

**OBJECTIVES** To determine the clinico-demographic and histopathologic characteristics of histopathologically-proven skin cancer Filipino patients in a Philippine public tertiary hospital.

**METHODS** This study included 121 patients with histopathologically-proven skin cancers from January 2015 to December 2019 in the dermatology and pathology departments of a public tertiary hospital in Manila, Philippines. Retrospective chart review and descriptive data analysis were conducted for this study.

**RESULTS** Of the 121 cases, the common skin cancers included basal cell carcinoma (54%), squamous cell carcinoma (27%), cutaneous lymphoma (7%), and melanoma (6%). The mean age was 63 ±16 years. There was a slight female preponderance (56%). The most commonly affected area was the head and neck region (73%). Most cases (54%) were clinically diagnosed by dermatologists, while the remaining patients were seen by non-dermatologists. Thus, the concordance between clinical diagnosis and histopathologic confirmation was 62% in basal cell carcinoma, 50% in cutaneous lymphoma, 29% in melanoma, and 24% in squamous cell carcinoma. Overall, the skin cancer lesions amongst the patients were significant at the time of diagnosis, with a median length of 20 mm and a median width of 18.5 mm.

**CONCLUSION** Basal cell carcinoma is the most common skin cancer (54%), followed by squamous cell carcinoma (27%). The head and neck was the most commonly affected region at 73%. Due to the low concordance of clinical and histopathologic confirmation, referral to a dermatologist is necessary to improve clinical accuracy. In the public tertiary hospital setting, whole-body skin examination should be a part of the initial dermatology screening to catch small skin cancers. A system to ensure regular follow-up of skin cancer patients should be initiated to optimize early detection of recurrence and subsequent treatment as necessary.

**KEYWORDS** skin cancer; basal cell carcinoma, squamous cell carcinoma, melanoma

## INTRODUCTION

Nonmelanoma skin cancer (NMSC) in Southeast Asia is 2.1 per 100,000 reported cases. Among these cases, males have a higher risk of developing NSMC with an incidence rate of 2.5 per 100,000 compared to females with 1.8 per 100,000 cases. In addition, the mortality rate in Southeast Asia is 0.10 per 100,000 in males and 0.06 per 100,000 in females.[1]

In the Philippines, melanoma ranked 26th among the most common skin cancer types, with 418 cases reported in 2020. In addition, it ranked 24th among the highest number of deaths, with 251 reported deaths and a 5-year prevalence of 1,131 reported cases.[2]

The Philippine Dermatological Society - Health Information System revealed 1,719 skin cancer cases from 2015 to 2019. Based on the data, the most common skin cancer was basal cell carcinoma (BCC) (1,166 or 68%), followed by squamous cell carcinoma (SCC) (319 or 19%) and melanoma (214 or 12%). BCC and melanoma were more common in females than in males (~1.9:1 and ~1.5:1, respectively), while SCC was more frequent in males than in females (~1.2:1).[3]

The true incidence of skin cancer, as well as the clinico-demographic and histopathologic profiles of skin cancer patients in the Philippines, has not been established. Moreover, to the authors' knowledge, no similar national or local studies have been published in recent years.

## METHODOLOGY

A retrospective, descriptive, and observational study was conducted in Quirino Memorial Medical Center (QMMC), Philippines, based on the 2015 to 2019 data from the hospital records. A total of 121 patients histopathologically diagnosed with skin cancer were included in the study. Personal, family and psychosocial history were

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obtained to determine the clinico-demographic profiles. Biopsy results were gathered to identify the histopathologic diagnosis and the presence of metastasis. Data regarding the treatment modalities and disease outcomes were also retrieved. All valid data, including data from patients with incomplete medical records, were integrated into the analysis. Missing variables were neither replaced nor estimated. STATA 15.0 was used for data analysis.

## RESULTS

Included in the study were 121 patients with histopathologic confirmation of skin cancer. The highest recorded incidence was in 2018, with 31 new diagnoses (Table 1). More than half (54%) of the patients were clinically diagnosed by dermatologists.

The mean age of patients was 63 ±16 years. There was a slight female preponderance (56%). Very few had data on occupation (n=5) and risk factors (n=4) (Appendix 1). The most common site of skin lesions was the head and neck (73%). In comparison, fewer were found on the trunk (10%), lower extremities (6%), upper extremities (3%), and genitalia (3%). One patient had lesions on both the trunk and lower extremities (0.83%). The most common presumptive diagnosis was BCC (34%). The most common diagnostic technique was plain incision biopsy (60%) (Table 2).

Overall, the skin cancer lesions had a median length of 20 (range 3-130) mm and a width of 18.5 mm (range 2-85) (Table 3).

Patients had a median of 3 (range 0.06-50) years from the onset of the lesions to receiving a histopathologic diagnosis of skin cancer and a median of 1 (range 0.17-21) year from histopathologic diagnosis to treatment initiation. Basal cell carcinoma was histopathologically confirmed in 54% of patients. The other significant diagnoses were SCC (27%), cutaneous lympho-

**Table 1.** Annual census of skin cancer (n=121)

| | Frequency | Proportion (95% CI) |
|---|---|---|
| **Year of diagnosis** | | |
| 2015 | 20 | 16.53 (10.40–24.37) |
| 2016 | 23 | 19.01 (12.45–27.14) |
| 2017 | 27 | 22.31 (15.25–30.78) |
| 2018 | 31 | 25.62 (18.12–34.35) |
| 2019 | 20 | 16.53 (10.40–24.37) |
| **Department** | | |
| Dermatology | 65 | 53.72 (44.43–62.83) |
| Surgery | 29 | 23.97 (16.68–32.57) |
| ENT | 22 | 18.18 (11.76–26.22) |
| OB-GYN | 2 | 1.65 (0.20–5.84) |
| Ophthalmology | 2 | 1.65 (0.20–5.84) |
| Orthopedics | 1 | 0.83 (0.02–4.52) |

ENT, ears, nose, and throat; OB-GYN, obstetrics-gynecology

**Table 2.** Clinico-demographic features of patients (n=121)

| | Median (Range); Mean ± SD; Frequency (%) |
|---|---|
| **Age (years)** | |
| | 65 (1–87); 62.74 ± 15.96 |
| 0-9 | 1 (0.83) |
| 10-19 | 1 (0.83) |
| 20-29 | 4 (3.31) |
| 30-39 | 4 (3.31) |
| 40-49 | 8 (6.61) |
| 50-59 | 23 (19.01) |
| 60-69 | 32 (26.45) |
| 70-79 | 36 (29.75) |
| ≥80 | 12 (9.92) |
| **Sex** | |
| Male | 53 (43.8) |
| Female | 68 (56.2) |
| **Occupation** | |
| Indoor | 2 (1.65) |
| Laundry worker | 1 (0.83) |
| Domestic helper | 1 (0.83) |
| Outdoor (construction worker) | 1 (0.83) |
| Mixed (driver) | 2 (1.65) |
| Unspecified | 116 (95.87) |
| **Site** | |
| Head and neck | 88 (72.73) |
| Trunk | 12 (9.92) |
| Lower extremities | 7 (5.79) |
| Upper extremities | 4 (3.31) |
| Genitalia | 4 (3.31) |
| Trunk + lower extremity | 1 (0.83) |
| Unspecified | 5 (4.13) |
| **Clinical diagnosis** | |
| Basal cell CA | 41 (33.88) |
| Squamous cell CA | 10 (8.26) |
| Cutaneous lymphoma | 4 (3.31) |
| Basal cell vs. squamous cell CA | 3 (2.48) |
| Melanoma | 3 (2.48) |
| Other | 13 (10.74) |
| Unspecified | 47 (38.84) |
| **Diagnostic technique** | |
| Incision biopsy | 73 (60.33) |
| Excision biopsy | 29 (23.97) |
| Incision + excision biopsies | 14 (11.57) |
| Incision + total penectomy with biopsy | 1 (0.83) |
| Percutaneous biopsy | 1 (0.83) |
| MRM with biopsy | 1 (0.83) |
| Lip and cheek reconstruction with biopsy | 1 (0.83) |
| Wound debridement with biopsy | 1 (0.83) |

CA, carcinoma; vs, versus; MRM, modified radical mastectomy

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**Table 3.** Lesion dimensions in millimeters

| | | Length | | Width | |
|---|---|---|---|---|---|
| | n | Mean ± SD; Median (Range) | | | |
| All | 76 | 31.23 ± 27.99 | 20 (3–130) | 23.75 ± 19.75 | 18.5 (2–85) |
| Basal cell CA | 35 | 27.97 ± 18.27 | 25 (3–80) | 22.15 ± 14.47 | 20 (2–64) |
| Squamous cell CA | 27 | 34.26 ± 34.45 | 18 (3–105) | 26.41 ± 26.09 | 13 (2–85) |
| Cutaneous lymphoma | 2 | 17.5 ± 3.54 | 17.5 (15–20) | 17 ± 4.24 | 17 (14–20) |
| Melanoma | 5 | 43.4 ± 49.95 | 25 (7–130) | 19 ± 18.17 | 10 (5–50) |
| Dermatofibrosarcoma protuberans | 2 | 51 ± 55.15 | 51 (12–90) | 32 ± 25.46 | 32 (14–50) |
| Paget's disease, mammary | 2 | 14 ± 8.49 | 14 (8–20) | 15 ± 7.07 | 15 (10–20) |
| Basosquamous CA, moderately differentiated | 1 | 20 | - | 20 | - |
| Langerhans cell histiocytosis | 0 | - | - | - | - |
| Malignant eccrine CA | 1 | 70 | - | 70 | - |
| Mucoepidermoid CA, high grade | 1 | 10 | - | 10 | - |

CA, carcinoma

**Table 4.** Diagnosis, treatment, and outcome

| Years from onset to histopathologic diagnosis | Frequency (%); Median (Range) |
|---|---|
| (n=62) | 3 (0.06–50) |
| <1 | 14 (22.58) |
| ≥1 | 48 (77.42) |
| **Years from histopathologic diagnosis to treatment** | |
| (n=11) | 1 (0.17–21) |
| <1 | 5 (45.45) |
| ≥1 | 6 (54.55) |
| **Histopathologic diagnosis** | |
| Basal cell CA | 65 (53.72) |
| Squamous cell CA | 33 (27.27) |
| Cutaneous lymphoma | 8 (6.61) |
| Melanoma | 7 (5.79) |
| Dermatofibrosarcoma protuberans | 2 (1.65) |
| Paget's disease, mammary | 2 (1.65) |
| Basosquamous CA, moderately differentiated | 1 (0.83) |
| Langerhans cell histiocytosis | 1 (0.83) |
| Malignant eccrine CA | 1 (0.83) |
| Mucoepidermoid CA, high grade | 1 (0.83) |
| **Metastasis** | |
| No | 8 (6.61) |
| Yes | 6 (4.96) |
| Unspecified | 107 (88.43) |
| **Treatment** | |
| Excision | 32 (26.45) |
| Wide excision | 14 (11.57) |
| Unspecified | 18 (14.88) |
| Excision with skin grafting | 3 (2.48) |
| Excision + chemotherapy | 1 (0.83) |
| Lip & cheek reconstruction | 1 (0.83) |
| Modified radical mastectomy | 1 (0.83) |
| NB-UVB + topical corticosteroids | 1 (0.83) |
| Mohs micrographic surgery | 1 (0.83) |
| Total penectomy | 1 (0.83) |
| Wound debridement | 1 (0.83) |
| Unspecified | 79 (65.29) |
| **Outcome** | |
| Resolution | 21 (17.36) |
| Lost to follow-up | 5 (4.13) |
| Recurrence | 1 (0.83) |
| Unspecified | 94 (77.69) |

CA, carcinoma; NB-UVB, narrowband UVB therapy

ma (7%), and melanoma (6%). Metastatic status was largely unspecified (88%). The most commonly performed treatment strategy was excision, either as sole management (26%) or combined with skin grafting (2%) or chemotherapy (0.8%). Unfortunately, one patient had a recurrence of skin cancer (Table 4).

The skin cancer types for the years 2015 (n=20), 2016 (n=23), 2017 (n=27), 2018 (n=31), and 2019 (n=20) are presented in Table 5.1. Basal cell CA was most frequently seen in 2018 (68%), while squamous cell CA was most commonly seen in 2017 (48%).

The skin cancer types were clinically diagnosed by the following services: dermatology (n=65), ENT (n=22), OB-GYN (n=2), ophthalmology (n=2), orthopedics (n=1) and surgery (n=29) (Table 5.2).

The histopathologic readings diagnosed by dermatopathology or general pathology are given in Table 5.3.

BCC was more common in females (66% vs. 34%), whereas SCC (64% vs. 36%) and melanoma (71% vs. 29%) were more common among males (Table 5.4).

The 60s and 70s age groups comprised a third of all those with basal cell carcinoma. Squamous cell carcinoma was most common among patients in their 50s (30%) and was likewise prevalent among those in their 60s (21%) and 70s (24%). Cutaneous lymphoma was primarily diagnosed in patients in their 20s (38%). Melanoma was only seen in patients 50 years old and above. A patient in his 30s (50%) and another in his 70s (50%) had dermatofibrosarcoma protuberance. Paget's disease was seen in patients in their 50s (50%) and 60s (50%). Basosquamous carcinoma was only seen in a patient in his 60s. One case of Langerhans cell histiocytosis was diagnosed in a child. Malignant eccrine carcinoma was seen in an elderly patient. Mucoepidermoid carcinoma was caught in a patient in his 40s (Table 5.5).

For basal cell carcinoma, there was a median of 5 years from the onset of lesions to histopathologic diagnosis and another 6 years from histopathologic diagnosis to treatment. For squamous cell carcinoma, there was a median of 2 years from the onset to histopathologic diagnosis but less than a year from histopathologic diagnosis to treatment. For the four cutaneous lymphoma patients, it took less than a year from the onset to histopathologic diagnosis on average. For the one melanoma case with data, it took half a year from the onset to histopathologic diagnosis and half a year from histopathologic diagnosis to

**Table 5.1.** Skin cancer types by year of diagnosis

| | Year | | | | |
|---|---|---|---|---|---|
| | 2015 (n=20) | 2016 (n=23) | 2017 (n=27) | 2018 (n=31) | 2019 (n=20) |
| **Skin cancer** | **Frequency (%)** | | | | |
| Basal cell CA | 11 (55) | 11 (47.83) | 11 (40.74) | 21 (67.74) | 11 (55) |
| Squamous cell CA | 4 (20) | 8 (34.78) | 13 (48.15) | 6 (19.35) | 2 (10) |
| Cutaneous lymphoma | 2 (10) | 0 (0) | 0 (0) | 1 (3.23) | 5 (25) |
| Melanoma | 2 (10) | 2 (8.7) | 2 (7.41) | 1 (3.23) | 0 (0) |
| Dermatofibrosarcoma protuberans | 0 (0) | 0 (0) | 0 (0) | 1 (3.23) | 1 (5) |
| Paget's disease, mammary | 0 (0) | 0 (0) | 1 (3.7) | 1 (3.23) | 0 (0) |
| Basosquamous CA, moderately differentiated | 0 (0) | 1 (4.35) | 0 (0) | 0 (0) | 0 (0) |
| Langerhans cell histiocytosis | 0 (0) | 1 (4.35) | 0 (0) | 0 (0) | 0 (0) |
| Malignant eccrine CA | 1 (5) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Mucoepidermoid CA, high grade | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (5) |

CA, carcinoma

**Table 5.2.** Skin cancer types clinically diagnosed per department

| | Department | | | | | |
|---|---|---|---|---|---|---|
| | Dermatology (n=65) | ENT (n=22) | OB-GYN (n=2) | Ophthalmology (n=2) | Orthopedics (n=1) | Surgery (n=29) |
| **Skin cancer** | **Frequency (%)** | | | | | |
| Basal cell CA | 45 (69.23) | 9 (40.91) | 1 (50) | 1 (50) | 0 (0) | 9 (31.03) |
| Squamous cell CA | 9 (13.85) | 10 (45.45) | 0 (0) | 0 (0) | 0 (0) | 14 (48.28) |
| Cutaneous lymphoma | 7 (10.77) | 1 (4.55) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Melanoma | 2 (3.08) | 0 (0) | 0 (0) | 1 (50) | 1 (100) | 3 (10.34) |
| Dermatofibrosarcoma protuberans | 1 (1.54) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (3.45) |
| Paget's disease, mammary | 0 (0) | 0 (0) | 1 (50) | 0 (0) | 0 (0) | 1 (3.45) |
| Basosquamous CA, moderately differentiated | 0 (0) | 1 (4.55) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Langerhans cell histiocytosis | 1 (1.54) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Malignant eccrine CA | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (3.45) |
| Mucoepidermoid CA, high grade | 0 (0) | 1 (4.55) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |

CA, carcinoma; ENT, ears, nose, and throat; OB-GYN, obstetrics-gynecology

**Table 5.3.** Skin cancer types histopathologically diagnosed per department

| | Dermatopathology (n=65) | General Pathology (n=56) |
|---|---|---|
| **Skin cancer** | **Frequency (%)** | |
| Basal cell CA | 45 (69.23) | 20 (35.71) |
| Squamous cell CA | 9 (13.85) | 24 (42.86) |
| Cutaneous lymphoma | 7 (10.77) | 1 (1.79) |
| Melanoma | 2 (3.08) | 5 (8.93) |
| Dermatofibrosarcoma protuberans | 1 (1.54) | 1 (1.79) |
| Paget's disease, mammary | 0 (0) | 2 (3.57) |
| Basosquamous CA, moderately differentiated | 0 (0) | 1 (1.79) |
| Langerhans cell histiocytosis | 1 (1.54) | 0 (0) |
| Malignant eccrine CA | 0 (0) | 1 (1.79) |
| Mucoepidermoid CA, high grade | 0 (0) | 1 (1.79) |

CA, carcinoma

**Table 5.4.** Sex distribution per skin cancer type

| | Male | Female |
|---|---|---|
| **Skin cancer** | **Frequency (%)** | |
| Basal cell CA (n=65) | 22 (33.85) | 43 (66.15) |
| Squamous cell CA (n=33) | 21 (63.64) | 12 (36.36) |
| Cutaneous lymphoma (n=8) | 4 (50) | 4 (50) |
| Melanoma (n=7) | 5 (71.43) | 2 (28.57) |
| Dermatofibrosarcoma protuberans (n=2) | 0 (0) | 2 (100) |
| Paget's disease, mammary (n=2) | 0 (0) | 2 (100) |
| Basosquamous CA, moderately differentiated (n=1) | 0 (0) | 1 (100) |
| Langerhans cell histiocytosis (n=1) | 0 (0) | 1 (100) |
| Malignant eccrine CA (n=1) | 0 (0) | 1 (100) |
| Mucoepidermoid CA, high grade (n=1) | 1 (100) | 0 (0) |

CA, carcinoma

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**Table 5.5.** Age distribution per skin cancer type

| | 0-9 | 10-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 | ≥80 |
|---|---|---|---|---|---|---|---|---|---|
| **Skin cancer** | **Frequency (%)** | | | | | | | | |
| Basal cell CA (n=65) | 0 (0) | 0 (0) | 1 (1.54) | 1 (1.54) | 3 (4.62) | 8 (12.31) | 22 (33.85) | 22 (33.85) | 8 (12.31) |
| Squamous cell CA (n=33) | 0 (0) | 0 (0) | 0 (0) | 2 (6.06) | 3 (9.09) | 10 (30.30) | 7 (21.21) | 8 (24.24) | 3 (9.09) |
| Cutaneous lymphoma (n=8) | 0 (0) | 1 (12.50) | 3 (37.50) | 0 (0) | 1 (12.50) | 1 (12.50) | 0 (0) | 1 (12.50) | 1 (12.50) |
| Melanoma (n=7) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 3 (42.86) | 1 (14.29) | 3 (43.86) | 0 (0) |
| Dermatofibrosarcoma protuberans (n=2) | 0 (0) | 0 (0) | 0 (0) | 1 (50) | 0 (0) | 0 (0) | 0 (0) | 1 (50) | 0 (0) |
| Paget's disease, mammary (n=2) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (50) | 1 (50) | 0 (0) | 0 (0) |
| Basosquamous CA, moderately differentiated (n=1) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (100) | 0 (0) | 0 (0) |
| Langerhans cell histiocytosis (n=1) | 1 (100) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Malignant eccrine CA (n=1) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (100) | 0 (0) |
| Mucoepidermoid CA, high grade (n=1) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (100) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |

CA, carcinoma

**Table 5.6.** Diagnosis and treatment interval per skin cancer type

| | Onset to diagnosis (years) | | Diagnosis to treatment (years) | |
|---|---|---|---|---|
| **Skin cancer** | **n=62** | **Median (Range)** | **n=11** | **Median (Range)** |
| Basal cell CA | 42 | 5 (0.17–50) | 4 | 6 (0.75–21) |
| Squamous cell CA | 11 | 2 (0.06–40) | 4 | 0.54 (0.17–1) |
| Cutaneous lymphoma | 4 | 0.17 (0.08–15) | 0 | - |
| Melanoma | 1 | 0.5 | 1 | 0.5 |
| Dermatofibrosarcoma protuberans | 2 | 4.38 (0.75–8) | 1 | 8 |
| Paget's disease, mammary | 1 | 5 | 1 | 5 |
| Basosquamous CA, moderately differentiated | 0 | - | 0 | - |
| Langerhans cell histiocytosis | 1 | 0.33 | 0 | - |
| Malignant eccrine CA | 0 | - | 0 | - |
| Mucoepidermoid CA, high grade | 0 | - | 0 | - |

CA, carcinoma

**Table 5.7.** Histopathologic findings per lesion site

| | H&N (n=88) | Trunk (n=12) | LE (n=7) | Genital (n=4) | UE (n=4) | Trunk + LE (n=1) | Unspecified (n=5) |
|---|---|---|---|---|---|---|---|
| **Skin cancer** | **Frequency (%)** | | | | | | |
| Basal cell CA | 57 (64.77) | 3 (25) | 2 (28.57) | 0 (0) | 1 (25) | 0 (0) | 2 (40) |
| Squamous cell CA | 24 (27.27) | 3 (25) | 2 (28.57) | 4 (100) | 0 (0) | 0 (0) | 0 (0) |
| Cutaneous lymphoma | 1 (1.14) | 2 (16.67) | 0 (0) | 0 (0) | 2 (50) | 1 (100) | 2 (40) |
| Melanoma | 2 (2.27) | 1 (8.33) | 3 (42.86) | 0 (0) | 0 (0) | 0 (0) | 1 (20) |
| Dermato-fibrosarcoma protuberans | 1 (1.14) | 0 (0) | 0 (0) | 0 (0) | 1 (25) | 0 (0) | 0 (0) |
| Paget's disease, mammary | 0 (0) | 2 (16.67) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Basosquamous CA, moderately differentiated | 1 (1.14) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Langerhans cell histiocytosis | 0 (0) | 1 (8.33) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Malignant eccrine CA | 1 (1.14) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Muco-epidermoid CA, high grade | 1 (1.14) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |

CA, carcinoma; H&N, head and neck; LE, lower extremities, UE, upper extremities

**Table 5.8.** Histopathologic outcomes per diagnostic technique

| Skin cancer | Incision biopsy (n=73) | Excision biopsy (n=29) | Incision + excision biopsy (n=14) | Incision biopsy + total penectomy + biopsy (n=1) | Lip & cheek reconstruction + biopsy (n=1) | MRM + biopsy (n=1) | Percutaneous biopsy (n=1) | Wound debridement + biopsy (n=1) |
|---|---|---|---|---|---|---|---|---|
| | Frequency (%) | | | | | | | |
| Basal cell CA | 36 (49.32) | 17 (58.62) | 10 (71.43) | 0 (0) | 1 (100) | 0 (0) | 0 (0) | 1 (100) |
| Squamous cell CA | 20 (27.4) | 8 (27.59) | 3 (21.43) | 1 (100) | 0 (0) | 0 (0) | 1 (100) | 0 (0) |
| Cutaneous lymphoma | 8 (10.96) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Melanoma | 5 (6.85) | 2 (6.9) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Dermatofibrosarcoma protuberans | 1 (1.37) | 1 (3.45) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Paget's disease, mammary | 1 (1.37) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (100) | 0 (0) | 0 (0) |
| Basosquamous CA, moderately differentiated | 0 (0) | 0 (0) | 1 (7.14) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Langerhans cell histiocytosis | 1 (1.37) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Malignant eccrine CA | 0 (0) | 1 (3.45) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Mucoepidermoid CA, high grade | 1 (1.37) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |

CA, carcinoma; MRM, modified radical mastectomy

**Table 5.9.** Metastasis per skin cancer type

| Skin cancer | No | Yes | Unspecified |
|---|---|---|---|
| | Frequency (%) | | |
| Basal cell CA (n=65) | 3 (4.62) | 0 (0) | 62 (95.38) |
| Squamous cell CA (n=33) | 4 (12.12) | 4 (12.12) | 25 (75.76) |
| Cutaneous lymphoma (n=8) | 0 (0) | 0 (0) | 8 (100) |
| Melanoma (n=7) | 1 (14.29) | 0 (0) | 6 (85.71) |
| Dermatofibrosarcoma protuberans (n=2) | 0 (0) | 0 (0) | 2 (100) |
| Paget's disease, mammary (n=2) | 0 (0) | 2 (100) | 0 (0) |
| Basosquamous CA, moderately differentiated (n=1) | 0 (0) | 0 (0) | 1 (100) |
| Langerhans cell histiocytosis (n=1) | 0 (0) | 0 (0) | 1 (100) |
| Malignant eccrine CA (n=1) | 0 (0) | 0 (0) | 1 (100) |
| Mucoepidermoid CA, high grade (n=1) | 0 (0) | 0 (0) | 1 (100) |

CA, carcinoma

treatment. Clinical intervals per skin cancer type are enumerated in Table 5.6.

Most lesions on the head and neck regions (n=88) were diagnosed as BCC (65%). All four patients with skin lesions on the genitalia had SCC. Most (43%) of those with lower extremity lesions (n=7) received a diagnosis of melanoma. Lesions confined to the trunk mainly were BCC (25%) or SCC (25%). Two of the four patients with upper extremity lesions, as well as one patient with lesions on both the trunk and lower extremities, had cutaneous lymphoma (Table 5.7).

Incision biopsy (73, or 60.3%) was the primary histopathologic technique used. It revealed basal cell carcinoma (36/65, or 49.3%), squamous cell carcinomas (20/33, or 27.4%), cutaneous lymphoma (8/8, or 11.0%), melanoma (5/7, or 6.9%), Paget's disease (1/2, 1.4%), Langerhans cell histiocytosis (1/1, 1.4%), and mucoepidermoid CA (1/1, or 1.4%) (Table 5.8).

Metastasis was documented in two patients with mammary Paget's disease and four patients with SCC (Table 5.9).

Basal cell carcinoma patients underwent excision, excision with skin grafting, lip and cheek reconstruction, Mohs micrographic surgery, and wound debridement. Squamous cell carcinoma patients underwent excision, excision with skin grafting, and total penectomy. Most patients had an unspecified entry for management (Table 5.10).

Resolution was documented in 13 BCC, 6 SCC, 1 melanoma, and 1 Paget's disease case. Recurrence was reported in one SCC patient. The rest of the patients were either lost to follow-up or had an unspecified outcome in the registry (Table 5.11).

The concordance between clinical diagnosis and histopathologic confirmation is presented in Table 6. There was 62% concordance for basal cell carcinoma, 24% for squamous cell carcinoma, and 50% for cutaneous lymphoma.

## DISCUSSION

This study included 121 biopsy proven skin cancer cases. The incidence increased annually from 2015 to 2018, with a sudden decrease in 2019, probably due to a reduction in skin cancer screening (Table 5.11).

10 types of skin cancers were observed in the study. The most common skin cancers were basal cell carcinoma (54%), squamous cell carcinoma (27%), cutaneous lymphoma (7%), and melanoma (6%). Although melanoma is the third most common type of skin cancer, a systemic review and meta-analysis study revealed that cutaneous T-cell lymphoma (CTCL) might be underdiagnosed. The same study stated that CTCL is 15% more frequent in Asians. CTCL was also linked to lymphoma-associated viruses such as the human T-lymphotropic virus (HTLV)-1, which is endemic in Asia, and Epstein-Barr virus (EBV).[4] A study by Veemer revealed a relatively stable incidence in well-described cutaneous lymphoma subtypes such as mycosis fungoides and lymphomatoid papulosis over time and an increase

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**Table 5.10.** Management per skin cancer type

| | Excision (n=32) | Excision + skin grafting (n=3) | Excision + Chemotherapy (n=1) | Lip & Cheek Reconstruction (n=1) | MRM (n=1) | NB-UVB + topical CS (n=1) | MMS (n=1) | Total Penectomy (n=1) | Wound Debridement (n=1) | Unspecified (n=79) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Skin cancer** | **Frequency (%)** | | | | | | | | | |
| Basal cell CA (n=65) | 17 (26.15) | 1 (1.54) | 0 (0) | 1 (1.54) | 0 (0) | 0 (0) | 1 (1.54) | 0 (0) | 1 (1.54) | 44 (67.69) |
| Squamous cell CA (n=33) | 10 (30.3) | 2 (6.06) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (3.03) | 0 (0) | 20 (60.61) |
| Cutaneous lymphoma (n=8) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (12.5) | 0 (0) | 0 (0) | 0 (0) | 7 (87.5) |
| Melanoma (n=7) | 2 (28.57) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 5 (71.43) |
| Dermatofibrosarcoma protuberans (n=2) | 1 (50) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (50) |
| Paget's disease, mammary (n=2) | 0 (0) | 0 (0) | 1 (50) | 0 (0) | 1 (50) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Basosquamous CA, moderately differentiated (n=1) | 1 (100) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Langerhans cell histiocytosis (n=1) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (100) |
| Malignant eccrine CA (n=1) | 1 (100) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| Mucoepidermoid CA, high grade (n=1) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 1 (100) |

CA, carcinoma; MRM, modified radical mastectomy; NB-UVB, narrowband ultraviolet B therapy; CS, corticosteroids; MMS, Mohs micrographic surgery

**Table 5.11.** Outcome per skin cancer type

| Skin cancer | Lost to follow-up | Recurred | Resolved | Unspecified |
|---|---|---|---|---|
| Basal cell CA (n=65) | 2 (3.08) | 0 (0) | 13 (20) | 50 (76.92) |
| Squamous cell CA (n=33) | 2 (6.06) | 1 (3.03) | 6 (18.18) | 24 (72.73) |
| Cutaneous lymphoma (n=8) | 1 (12.5) | 0 (0) | 0 (0) | 7 (87.5) |
| Melanoma (n=7) | 0 (0) | 0 (0) | 1 (14.29) | 6 (85.71) |
| Dermatofibrosarcoma protuberans (n=2) | 0 (0) | 0 (0) | 0 (0) | 2 (100) |
| Paget's disease, mammary (n=2) | 0 (0) | 0 (0) | 1 (50) | 1 (50) |
| Basosquamous CA, moderately differentiated (n=1) | 0 (0) | 0 (0) | 0 (0) | 1 (100) |
| Langerhans cell histiocytosis (n=1) | 0 (0) | 0 (0) | 0 (0) | 1 (100) |
| Malignant eccrine CA (n=1) | 0 (0) | 0 (0) | 0 (0) | 1 (100) |
| Mucoepidermoid CA, high grade (n=1) | 0 (0) | 0 (0) | 0 (0) | 1 (100) |

CA, carcinoma

in other cutaneous lymphoma subtypes such as folliculotropic mycosis fungoides.[5]

The cases were clinically diagnosed by various physicians. Most of the patients (54%) were from the dermatology department. The remaining cases were diagnosed by surgery (24%), ENT (18%), OB-GYN (2%), ophthalmology (2%), and orthopedics (1%) departments. A 2014 study revealed that skin cancer detection via visual whole-body examination by non-dermatologists had a sensitivity rate of only 29%, implying an accuracy increase if skin cancers were clinically diagnosed by dermatologists.[6]

Of the 121 cases, 65 (54%) were histopathologically diagnosed by a single dermatologist, while only 56 (46%) were analyzed by a single general pathologist. Skin biopsies that show minimal histopathologic changes pose a challenge for general pathologists. They are often signed out as "no specific diagnosis." A study by Alhumidi et al. showed that 81 similar cases were reviewed and diagnosed by dermatopathologists. 53% of these biopsies had a specific diagnosis, 47% remained nonspecific, and the remaining were due to inadequate biopsy, inactive skin lesions, or inadequate clinical data.[7]

Basal cell carcinoma was more common in females (66%) than in males (34%). Older studies focusing more on Caucasians revealed a higher incidence in males than females. However, recent literature showed an increasing incidence of BCC in females.[8,9] The increase in female incidence was associated with changes in clothing and sun exposure behavior.[9] In addition, a 2016 retrospective study revealed that NMSCs, including SCC, were more common in Asian females than males. The same study concluded that females are more likely to notice lesions on the face and, thus, seek consult more often than males.[10]

In this study, SCC and melanoma were more common in males than females. This was consistent with previous studies. The male predominance was attributed to more frequent occupational sun exposure.[8]

The mean age of patients in this study was 63 ±16 years. The majority of the cases were diagnosed at ages 70-79. This was consistent with previous studies that found a higher risk in older age groups with an increase in incidence during their 40s and a significant rise beginning in their 50s.[9,11] A decline in cases was seen in ages 80 and above, probably due to senile mortality.

In this study, the most commonly affected area was the head and neck (72.73%). This was congruent with previous literature, which stated that sun-exposed areas are more likely to develop skin cancer. All four skin cancers of the genital area (3.31% of all skin cancer cases) were SCC. This coincided with previous studies indicating an increased risk of HPV-associated

**Table 6.** Clinicopathologic concordance among different skin cancer types

| Histopathologic findings | Number | Proportion of concordance with clinical diagnosis | Misdiagnosed diseases (cases) |
|---|---|---|---|
| Basal cell CA | 65 | 40 (61.54) | Basal cell CA vs squamous cell CA – 2<br>Dysplastic nevus, rule out basal cell carcinoma – 1<br>Irritated seborrheic keratosis vs pigmented basal cell CA – 1<br>Squamous cell CA – 1<br>Trichoepithelioma vs basal cell CA – 1<br>No clinical diagnosis – 19 |
| Squamous cell CA | 33 | 8 (24.24) | Anterior mediastinal wall mass – 1<br>Basal cell CA – 1<br>Basal cell CA vs squamous cell CA – 1<br>Basal cell CA vs superficial spreading melanoma – 1<br>Maxillary mass, probably malignant – 1<br>Melanoma – 1<br>Penile cancer – 1<br>No clinical diagnosis – 18 |
| Cutaneous lymphoma | 8 | 4 (50) | Exfoliative dermatitis – 1<br>Leukemia cutis – 1<br>Squamous cell CA – 1<br>No clinical diagnosis – 1 |
| Melanoma | 7 | 2 (28.57) | Soft tissue mass – 1<br>No clinical diagnosis – 4 |
| Dermatofibrosarcoma protuberans | 2 | 0 (0) | Xanthogranuloma vs dermatofibroma – 1<br>No clinical diagnosis – 1 |
| Paget's disease | 2 | 1 (50) | No clinical diagnosis – 1 |
| Basosquamous CA | 1 | 0 (0) | No clinical diagnosis |
| Langerhans cell histiocytosis | 1 | 0 (0) | No clinical diagnosis |
| Malignant eccrine CA | 1 | 0 (0) | No clinical diagnosis |
| Mucoepidermoid CA | 1 | 0 (0) | No clinical diagnosis |

CA, carcinoma; vs, versus

SCC in this body region. Other sites include the trunk (9.92%), upper extremities (3.31%), and lower extremities (3.31%). Previous literature revealed a decreased risk for skin cancer on the extremities, especially on the hands and feet, possibly due to skin hardening.[12]

Consistent with most studies, hypertension (9.92%) was the most common comorbidity in this study. In addition, it was also associated with various cancers. Other comorbidities included asthma (4.13%), pulmonary tuberculosis (PTB) (4.13%), diabetes mellitus (DM) (2.48%), and systemic lupus erythematosus (SLE) (2.48%). The association of DM and diabetic drugs with skin cancers is controversial but is often investigated. PTB is endemic in the Philippines, which may partly explain the association in this study. In addition, a study from China revealed that skin cancer was the 7th most common cancer associated with PTB in an endemic area in China. Some studies also associated skin cancer with immunosuppression, such as SLE. Most risk factors from this study included sun exposure. This was consistent with previous studies discussing the role of sun exposure in cutaneous carcinoma.[13,14] Data on occupation from this study was inadequate to make a conclusion.

Overall, the skin cancer lesions had a median length of 20 (range 3-130) mm and a width of 18.5 (range 2-85) mm (Table 3). Depending on the body site, BCC and SCC are considered high risk if the largest diameter is ≥10-20 mm.[15] A 2020 study revealed an increased risk for distant metastasis for melanomas ≥42mm.[16] Mycosis fungoides (MF) comprise most of the cutaneous lymphoma in this study. However, size is only one of the factors to determine MF prognosis.[17]

In this study, the time from the onset of lesions to histopathologic diagnosis was three years and the time from histopathologic diagnosis to treatment was one year. A study in Italy revealed that a delay in histopathologic diagnosis and treatment for SCC was associated with a lack of time for consult and urgency, as most patients did not consider the primary lesions dangerous. Based on the highest quartile percentile, the same study defined long total delay as more than 18 months from the appearance of lesion to removal.[18] Among the five melanoma cases, only one had data from the onset to histopathologic diagnosis (6 months). According to a 2021 study, the most common reasons for a delay in seeking consultation or treatment for BCC were avoidance behavior, misconceptions and banalization of symptoms, and fear of treatment.[19] Although BCC is correlated with a good prognosis, urgent treatment is imperative to prevent

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complications. A 2017 study revealed that a treatment delay of more than 90 days (3 months) was associated with a decrease in overall survival for melanoma.[20]

According to previous studies, the most common biopsy techniques used were excisional, incisional, shave, and punch biopsy. However, some studies consider shave and punch biopsies as types of incisional biopsy, hence the subclassification for this study. There are no clear-cut guidelines to guide clinicians on which technique to use. The choice of technique should be based on the lesion's character and the biopsy's intent.[21]

Concordance between clinical diagnosis and histopathologic confirmation was high in basal cell carcinoma (62%), cutaneous lymphoma (50%), and melanoma (29%). However, squamous cell carcinoma had a relatively low concordance rate (24%), implying that SCC is more challenging to diagnose. Therefore, a second opinion is recommended to increase diagnostic accuracy. In addition, an adequate number of slides should be provided to the pathologist to improve result reproducibility.[22]

Diagnostic interventions used in this study were incision biopsy (n=73), excision biopsy (n=29), incision and excision biopsy (incision biopsy supported or confirmed by excision biopsy) (n=14), incision biopsy and total penectomy with biopsy (n=1), percutaneous biopsy (n=1), lip and cheek reconstruction with biopsy (n=1), MRM with biopsy (n=1), and wound debridement with biopsy (n=1). The study was conducted in a public tertiary hospital with a high volume of patients and limited medical and financial resources. Hence, physicians often choose a treatment modality that can also serve as a diagnostic intervention, such as an excision biopsy.

The most common treatment modalities were excision (n=32), excision with skin grafting (n=3), excision with chemotherapy (n=1), and lip and cheek reconstruction (n=1). Other treatments included MRM (n=1), NB-UVB and topical corticosteroids (n=1), MMS (n=1), total penectomy (n=1), and wound debridement (n=1). Unfortunately, most cases (n=79) either had missing data or were lost to follow-up. The use of the different treatment modalities in this study might be due to the preference of the leading service handling the cases. At the same time, some could be incidental findings from surgical procedures done by the different departments.

Among the six cases with metastasis, four were SCC, and two were mammary Paget's disease. The remaining cases were unspecified. The majority of 94 (77.69%) patient outcomes were also unspecified. Only 21 (17.36%) cases were resolved, five (4.13%) were lost to follow-up, and one (0.83%) had a recurrence of skin cancer.

Table 5.11 shows that the outcomes of the majority of the skin cancer cases were unspecified. 76.92% for basal cell carcinoma, 72.73% for squamous cell carcinoma, 87.5% for cutaneous lymphoma, and 85.71% for melanoma. There is a need to stress the importance of regular follow-up in managing skin cancer patients to optimize early detection of recurrence and subsequent treatment as necessary.

During this study, the patient data were in the traditional paper-based record system, resulting in missing data. Currently, the institution is transitioning to an electronic health record system for better record keeping.

### LIMITATIONS

First, although most data needed for the study was available, a large part of the data from different categories was missing either due to lost and irretrievable patient charts or improper and incomplete documentation by physicians attributed to the bulk of patients seen in the public tertiary hospital. Second, many cases were initially clinically diagnosed by non-dermatologists, thus affecting the proportional concordance rate between clinical and histopathologic diagnosis. Almost half of the skin cancer cases were histopathologically diagnosed by general pathologists with a different histopathologic approach compared to dermatopathologists.

### RECOMMENDATIONS

The authors suggest improvement of hospital record keeping using the electronic health record system; the creation of a uniform hospital guideline for proper diagnosis and management of cutaneous carcinomas; the conduct of multicenter studies to increase sample size and strengthen future research results; and the establishment of a skin cancer central database in the Philippines to determine the true incidence and clinico-demographic and histopathologic profile of skin cancer patients. In the public tertiary hospital setting, a system to ensure regular follow-up of skin cancer patients should be initiated to optimize early detection of recurrence and subsequent treatment as necessary. A skin cancer central database in the Philippines is needed to improve patient management and provide accurate data for future research.

## CONCLUSION

Skin cancer incidence is increasing annually and is more common in the elderly. BCC and SCC were the most common skin cancers. The head and neck area was the most commonly affected region. A female preponderance could be due to the changes in clothting and sun-seeking behaviors. To increase diagnostic accuracy, a second opinion with a dermatologist or a dermatopathologist is recommended for clinically suspicious lesions or inadequate histopathologic findings, respectively. Screening and patient education are essential for the timely management of skin cancers and the prevention of progression and complications. Proper documentation and a central database are needed to improve patient management and aid future research.

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