

# Impact of Treatment Related Side Effects in Quality of Life of Patients with Head and Neck Cancer

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## Abstract

Cancer is the leading cause of death in all parts of the world. Head and neck cancer (HNC) comprise a unique group of aero-digestive tract malignancies that include the seventh most common cancer in the world. As patients receiving chemotherapy would usually experience many side effects and these can affect their quality of life captiously. So that this study can be used in amelioration of the Quality of life of patients with head and neck cancer. By understanding quality of life status, therapy could be optimized accordingly or take precautionary measures to avoid that specific effect. A Cross-sectional study was carried out among 25 samples in Department of Oncology, ESI PGIMSR, Rajajinagar of Bengaluru. The data was collected by using EORTC QLQ C 30 and HNC 35 questionnaire and responses were recorded. All information's were processed and analyzed by using Microsoft excel. Majority of the subjects included in the study were males (23, 92%) followed by females (8, 8%) The highest number of subjects included in the study belonged to 50-59 years age group (9, 36%) followed by 60-69 age group (8, 32%). Out of 25 study subjects, 15 patients had social habit of smoking (37%) and Alcohol consumption (15,39%), tobacco chewing (5,13%) and No habits (4,11%). The Quality-of-Life score obtained from the 25 study subjects who are undergoing any treatment was found to have a neutral to good quality of life (not excellent). The average raw score and the respective linear score was found to be 4.16,52.66 for global health status, Functional scale was found to have 1.76,74.8 and Symptom scale was found to be 1.88,29.29. The correlation was done in SPSS software and found a negative value which interpreted as the increasing Side Effects is leading to the decline in quality of life.

**Keywords:** Head and Neck Cancer, Quality of life, Side effects

## 1. Introduction

Cancer is the leading cause of death in all parts of the world. As per the World Health Organization (WHO) in 2019, around the globe, cancer is the suspect for first or second cause of morbidity. [1]

Cancer is the uncontrolled growth and spread of cells that attacks surrounding cells and can travel to other sites. Most common risk factors are tobacco and alcohol.[1] Cancer can be cured by early diagnosis and treatment with surgery, chemotherapy and radiation therapy. [2]

After the transformation of normal cell to cancer cells, they divide uncontrolled and starts to invade nearby cells. Normal cells too divides and grow but its controlled by the body according to the needs. [3]

When cells grow old or become damaged, they die, and new cells take their place but in cancerous cells, this process of cell death is inhibited. These cells also invade the immune system, a protective mechanism against infections, and other factors, which consists of a group of organs, tissues and specific cells.[4]

Although the immune system normally flushes out damaged or abnormal cells or other contents from the body, some cancer cells can hide from this process. By the accumulation of these abnormal cells will finally result in the formation of a solid mass known as tumor.[5]

Tumors can be classified mainly as solid and liquid tumor. Tumors in blood such as leukemia comes under liquid tumor. Tumor which has the ability to break off from the initial site and travel to other parts of the body through blood or lymphatic fluids and called as malignant tumor. Benign tumor does not have this property but it can grow more in size than malignant. Usually, they don't regrow once they are removed, whereas malignant ones can. Benign tumor can be serious according to its location like brain.[6]

### **Epidemiology:**

Cancer is the second cause of death globally and is responsible for millions of death and India's share will be 8.17%. Prostate, lung, stomach, colorectal and liver cancer are the most common types of cancer in men while breast, colorectal, lung, cervix and thyroid cancer are the most common in women.[1]

According to a study, 10 cancers resulting the highest Disability Adjusted Life Years (DALYs) in India was found to be the cancers of stomach, lung, pharynx other than nasopharynx, colon and rectal, leukemia, esophageal and brain and nervous system, breast, lip and oral cavity, and cervical cancer, thus laid a path for screening and early detection.[7]

Globally, the incidence of cancer was 19% higher for men than for women by 2020.[8]

Overall chances of developing cancer are 20.2% in which 22.4% for men and 18.2% in women.[9]

### **Head and Neck Cancer**

Head and neck cancer (HNC) comprise a unique group of cancer in the aero-digestive tract that include the seventh most common cancer globally.[10] In India, Crude Rate 15.6 HNC cases are reported in year 2020.[11]

There are two main causes of HNC: (1) tobacco and alcohol use, and (2) and human papillomavirus (HPV), a sexually transmitted disease. HNC as a whole is almost two to three times more common in men than women in many developed countries and although this rate varies geographically, men in many countries have two to five times greater risk of HNC than women. HPV-HNC patients are mainly male (85% –90%) and white (92% –95%), aged between 50 and 56 years.[10]

### **Treatment related side effects:**

Head and neck cancer is treated mainly by RT and Chemoradiation therapy. Treatment related side effects will vary according to the physical condition of the patient, treatment method, Disease site, Stages of cancer.

Most commonly observed side effects are:

- Mucositis
- Skin discoloration
- Fatigue

- Dry mouth
- Constipation
- Diarrhea
- Weight loss
- Hematological problems in:
  - Hemoglobin
  - Total WBC count
  - Platelet
  - Albumin level
  - SGOT/SGPT
  - Creatine level
  - Electrolytes- Sodium and Potassium

### **EORTC QUESTIONNAIRE**

The European Organization for Research and Treatment of Cancer (EORTC) Core Quality of Life questionnaire (EORTC QLQ-C30) and (HNC 35) is 2 sets of questionnaires which work together to assess quality of life in general cancer and specific head and neck cancer respectively. It is designed to measure cancer patients' multiple aspects of functioning, general health and symptom status. The questionnaire is composed of multi-item scales and single items. The scoring pattern for the questionnaire will depend on the response provided by the study subjects in the respective scales. This response will be evaluated with the scoring methods provided with the questionnaire. So obtained score can be related with quality of life.

### **Purpose of the study**

As patients receiving chemotherapy would usually experience many side effects and these can affect their quality of life captiously. So that this study can be used in amelioration of the Quality of life of patients with head and neck cancer. By understanding quality of life status, therapy could be optimized accordingly or take precautionary measures to avoid that specific effect.

### **2. Material and Methods**

This was a Cross-sectional observational study, and subjects for the study were identified by the investigator during ward rounds based on the inclusion and exclusion criteria. Relevant data (demographic details, prescription details) collected were recorded on the Self-designed data collection form. The data thus obtained was entered into a Microsoft Excel sheet and analyzed appropriately. A total of 42 samples were collected, of which 25 were selected for the study. The study was approved by Institutional Ethics Committee of the tertiary care teaching hospital, Bengaluru in accordance with the guidelines issued by ICMR (No.532/L/11/12/Ethics/ESICMC&PGIMSR/Estt.Vol.-IV).

### **Inclusion criteria:**

Patients diagnosed with any type of Head and Neck cancer from the OP Department of Oncology, ESIC&PGIMSR, Rajajinagar.

- Individuals above the age of 18 years

- Patients of any gender
- Individuals willing to provide consent.

**Exclusion criteria:**

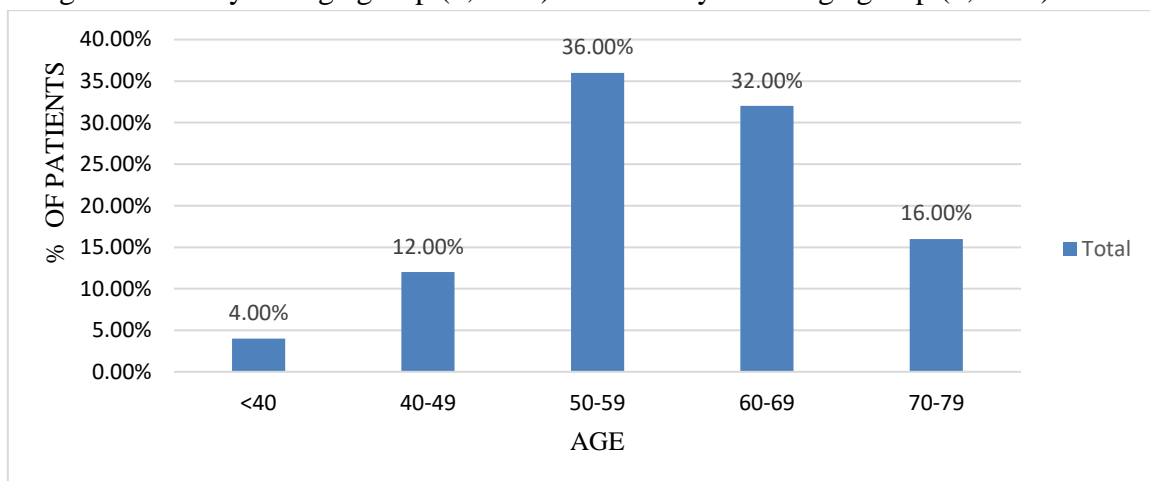
Patients with chronic mental illness

**Statistical Analysis:**

All recorded data were entered and analyzed using MS Excel. Descriptive statistics were computed for quantitative variables. Frequencies and percentages were calculated for categorical values. Column charts, pie-charts, bar graphs were applied to find the nature of data distribution. Correlation was done using SPSS.

**3. Results:**

The study was conducted over a period of six from March 1st to August 20th, which included 25 patients visiting the day care oncology department of ESI-MC PGIMSR & MH, Rajajinagar, Bangalore. Subjects were categorized based on the age (shown in Figure 1). The highest number of subjects included in the study belonged to 50-59 years age group (9, 36%) followed by 60-69 age group (8, 32%).

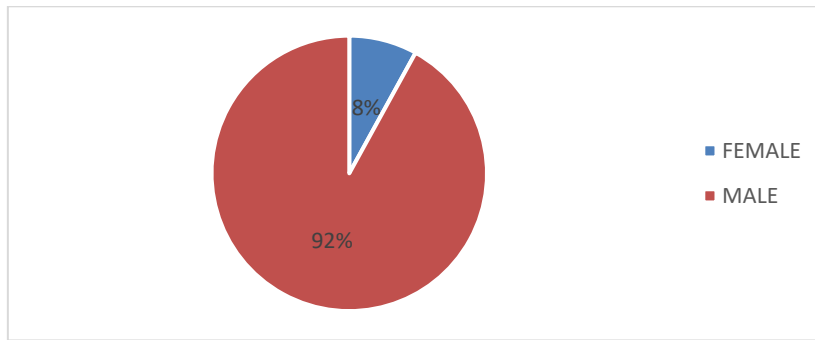


**“Figure.4: Distribution of subjects by age”**

Majority of the subjects included in the study were males (23, 92%) followed by females (2, 8%) as shown in Figure 2 and Table 1

| GENDER             | NUBER OF PATIENTS | PERCENTAGE |
|--------------------|-------------------|------------|
| FEMALE             | 2                 | 8          |
| MALE               | 23                | 92         |
| <b>Grand Total</b> | <b>25</b>         | <b>100</b> |

**“Table 1. Distribution of subjects by Gender”**

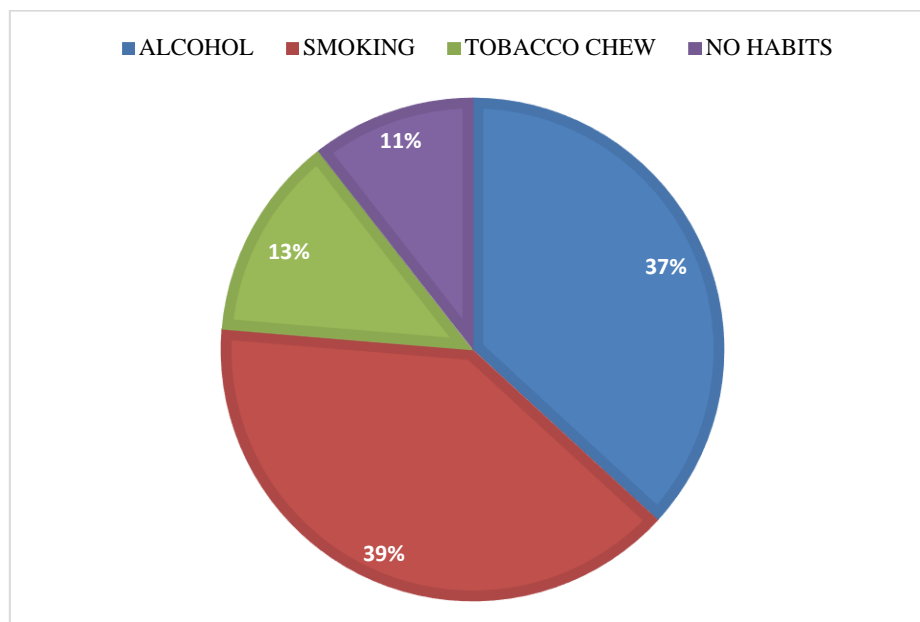


“Figure 5. Distribution of subjects by gender”

Out of 25 study subjects, 15 patients had social habit of smoking (37%) and Alcohol consumption (15,39%), tobacco chewing (5,13%) and No habits (4,11%) (as shown in Table 2 and figure3)

| SOCIAL HABITS | NUMBER OF PA-TIENTS | PERCENTAGE |
|---------------|---------------------|------------|
| ALCOHOL       | 14                  | 37         |
| SMOKING       | 15                  | 39         |
| TOBACCO CHEW  | 5                   | 13         |
| NO HABITS     | 4                   | 11         |

“Table 2. Distribution of subjects by social habit”



“Figure 6. Distribution of subjects by social habit”

### EORTC QUESTIONNAIRE RESULTS

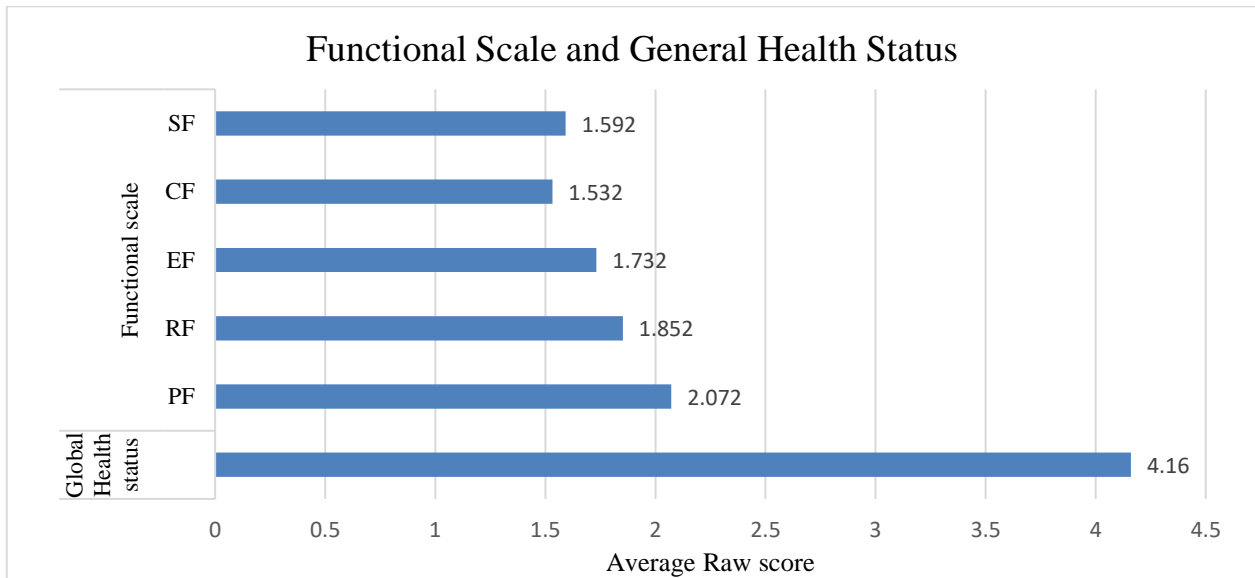
All the 25 study subjects were administered by the study tool. Scoring for each criterion was done as per the tool scoring manual. The Raw score obtained as per the scoring is then converted to the Linear score in terms of 100 which would make the results easy to comprehend.

| Scales                      | Class | Average Raw Score | SD   |
|-----------------------------|-------|-------------------|------|
| <b>Global Health status</b> | -     | 4.16              | 1.24 |
| <b>Functional scale</b>     | PF    | 2.072             | 0.70 |
|                             | RF    | 1.852             | 0.82 |
|                             | EF    | 1.732             | 0.76 |
|                             | CF    | 1.532             | 0.76 |
|                             | SF    | 1.592             | 0.71 |

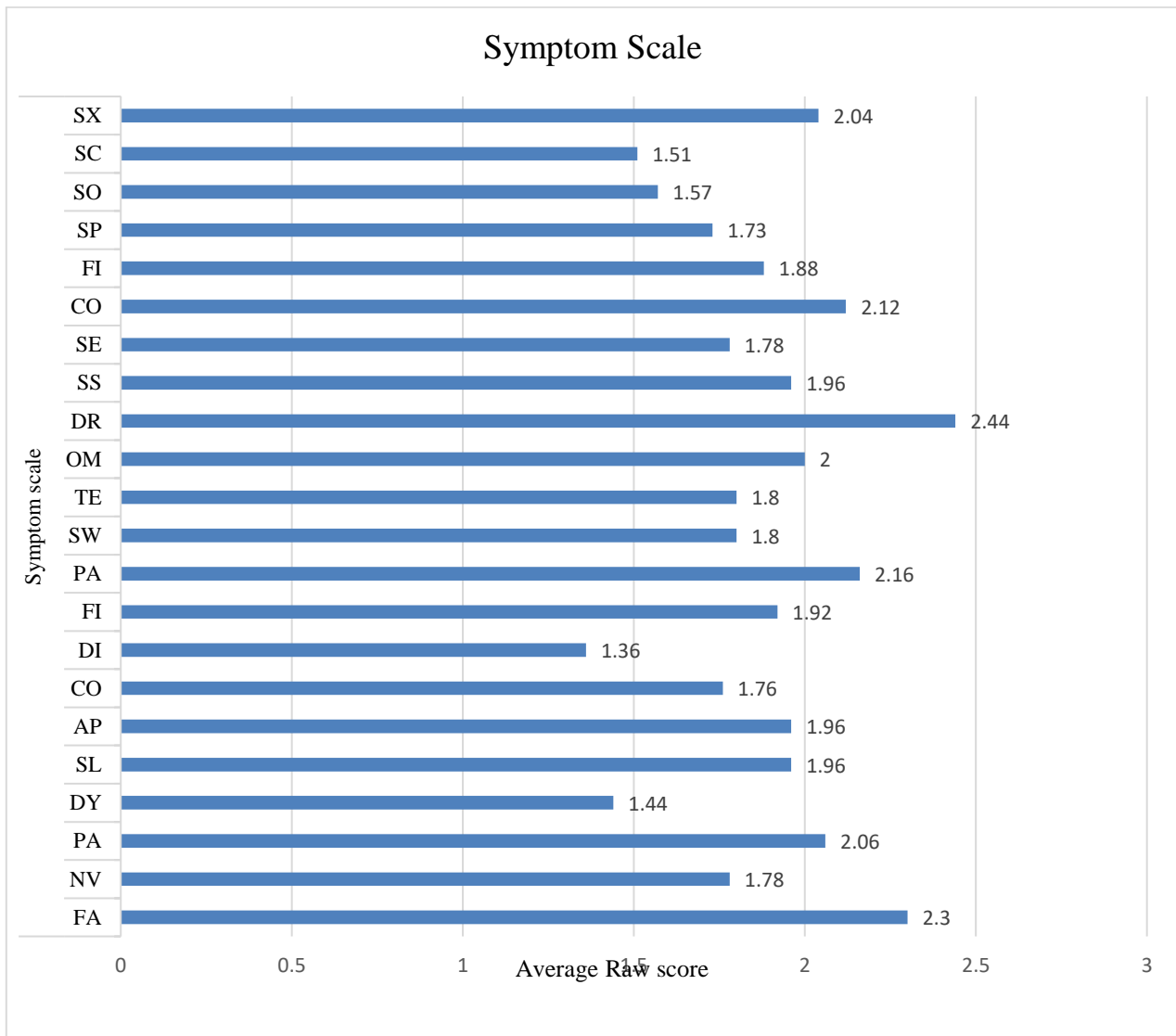
“Table 3a. Score Distribution for Scales”

| Scales               | Class | Average Raw Score | SD   |
|----------------------|-------|-------------------|------|
| <b>Symptom scale</b> | FA    | 2.3               | 0.66 |
|                      | NV    | 1.78              | 0.89 |
|                      | PA    | 2.06              | 0.71 |
|                      | DY    | 1.44              | 0.82 |
|                      | SL    | 1.96              | 0.93 |
|                      | AP    | 1.96              | 0.98 |
|                      | CO    | 1.76              | 0.93 |
|                      | DI    | 1.36              | 0.81 |
|                      | FI    | 1.92              | 0.81 |
|                      | PA    | 2.16              | 0.66 |
|                      | SW    | 1.8               | 0.71 |
|                      | TE    | 1.8               | 0.91 |
|                      | OM    | 2                 | 0.87 |
|                      | DR    | 2.44              | 1.08 |
|                      | SS    | 1.96              | 1.06 |
|                      | SE    | 1.78              | 0.66 |
|                      | CO    | 2.12              | 0.83 |
|                      | FI    | 1.88              | 0.73 |
|                      | SP    | 1.73              | 0.80 |
|                      | SO    | 1.57              | 0.59 |
| SC                   | 1.51  | 0.65              |      |
| SX                   | 2.04  | 0.71              |      |

“Table 3b. Score Distribution for Scales”



**“Fig 7a. Score Distribution for Functional Scales and Global health status**

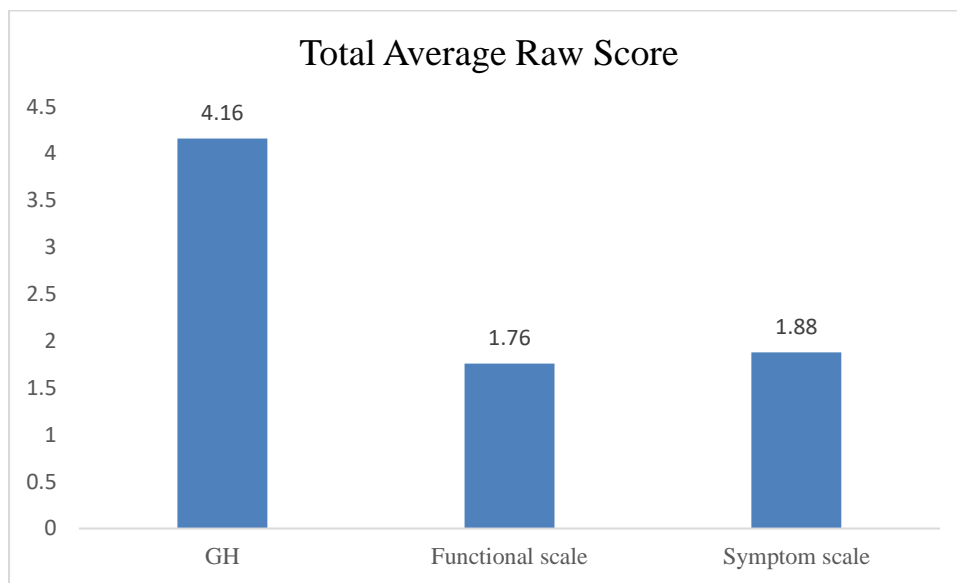


**“Fig 7b. Score Distribution for Symptom Scale”**

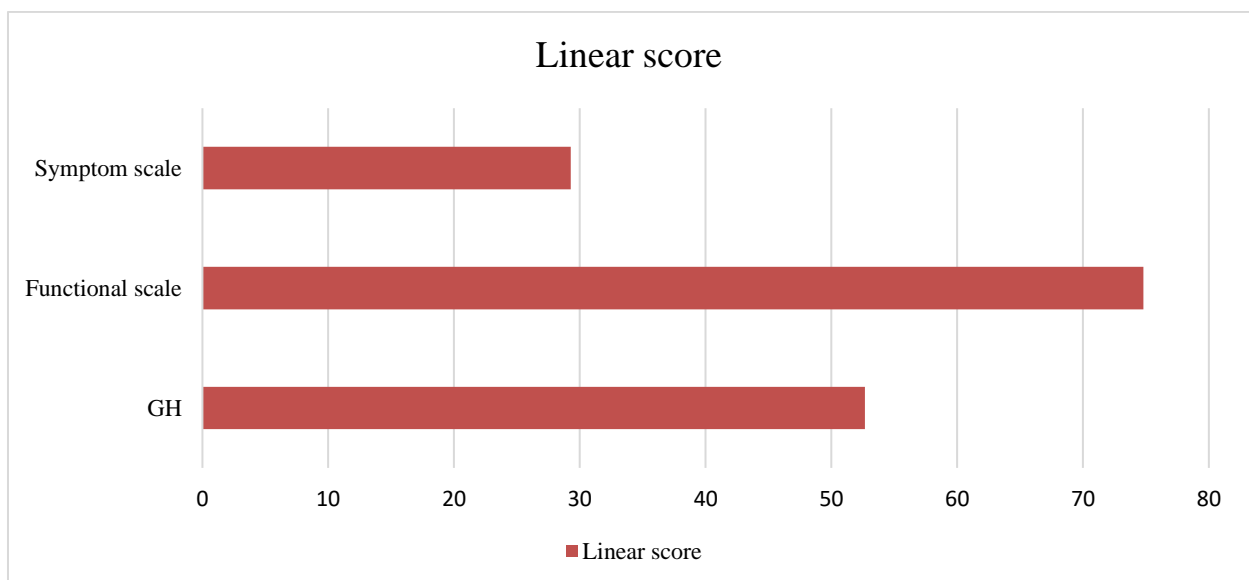
The average raw score and the respective linear score was found to be 4.16,52.66 for global health status, Functional scale was found to have 1.76,74.8 and Symptom scale was found to be 1.88,29.29. (shown in table 4 and figure.8a&5b).

| Scales                  | Total Average Raw Score (SD) | Linear score |
|-------------------------|------------------------------|--------------|
| <b>GH</b>               | 4.16±1.24                    | 52.66        |
| <b>Functional scale</b> | 1.76±0.75                    | 74.8         |
| <b>Symptom scale</b>    | 1.88±0.81                    | 29.29        |

“Table 4. Average Raw score and Linear score Distribution for Scales”



“Figure 8a. Average Raw score distribution for scales”



“Fig 8b. Linear score distribution for scales”

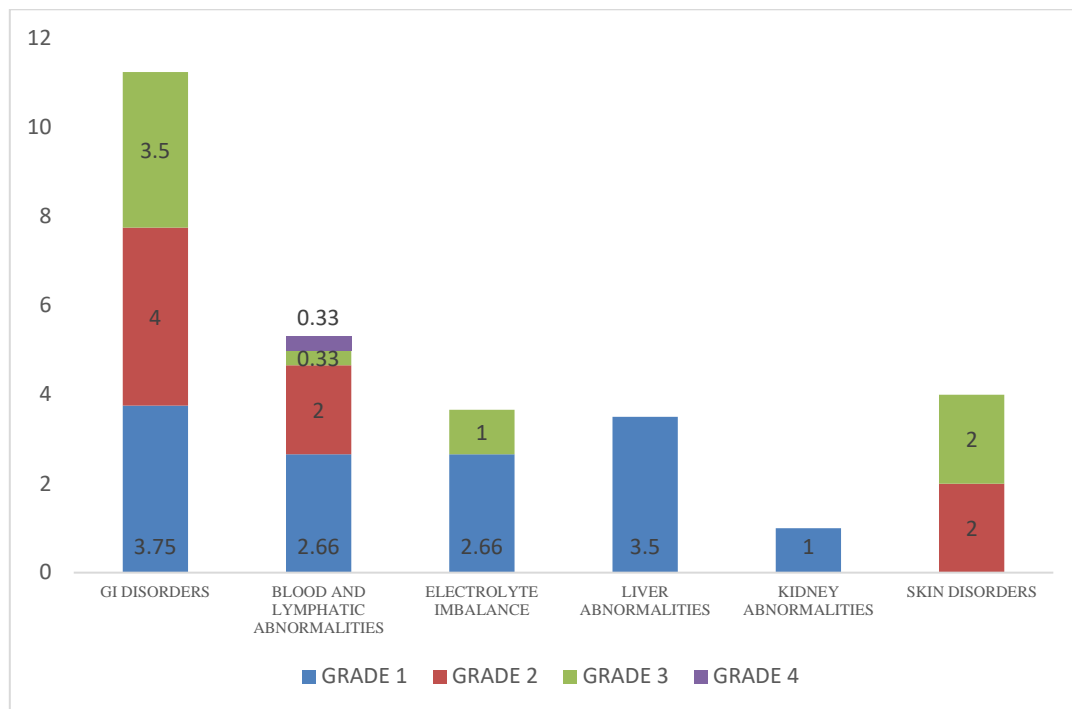


As per CTCAE guidelines the side effects observed in patients was graded and the number of patents under each side effects were found to be as shown in Table 5.

| SIDE EFFECTS                                |                            | N(%)    | GRADE 1 | GRADE 2 | GRADE 3 | GRADE 4 |
|---|----------------------------|---------|---------|---------|---------|---------|
| <b>Gastrointestinal disorders</b>           | Constipation               | 12(48%) | 6       | 5       | 1       | 0       |
|   | Diarrhea                   | 5(25%)  | 2       | 2       | 1       | 0       |
|   | Dry mouth                  | 19(76%) | 7       | 7       | 5       | 0       |
|   | Mucositis oral             | 8(32%)  | 0       | 2       | 6       | 0       |
| <b>Blood and lymphatic system disorders</b> | Anemia                     | 9(36%)  | 5       | 4       | 0       | 0       |
|   | White blood cell decreased | 5(25%)  | 2       | 2       | 1       | 0       |
|   | Platelet count decreased   | 2(8%)   | 1       | 0       | 0       | 1       |
| <b>Electrolyte imbalance</b>                | Hyperkalemia               | 3(12%)  | 3       | 0       | 0       | 0       |
|   | Hypokalemia                | 1(4%)   | 0       | 0       | 1       | 0       |
|   | Hyponatremia               | 7(28%)  | 5       | 0       | 2       | 0       |
| <b>Liver abnormalities</b>                  | SGPT                       | 3(12%)  | 3       | 0       | 0       | 0       |
|   | SGOT                       | 4(16%)  | 4       | 0       | 0       | 0       |
| <b>Kidney abnormalities</b>                 | Creatinine increased       | 1(4%)   | 1       | 0       | 0       | 0       |
| <b>Skin changes</b>                         | Skin discolouration        | 4(16%)  | 0       | 2       | 2       | 0       |

**“Table 5. Distribution of Subjects by side effects”**

The mean number of patients under each system related side effect is shown in Figure 6.



“Figure 9. Distribution of subjects by side effects”

The significance of side effects is found by using chi square test and found to be 0.007140264 Which is less than 0.05 and hence it is significant. The side effects observed in each patient were recorded and correlated with the quality of life of the study subjects which was assessed by the study tool. The correlation was done in SPSS software and found to be **-0.402**. As the value being negative the correlation is interpreted as the negative correlation where the increasing Side Effects is leading to the decrease in Quality of Life.

### Discussion:

This study was conducted in the Out-patient Chemotherapy ward of Department of oncology, in ESI-MC PGIMSR & MH, Rajajinagar, Bengaluru. A total of 25 patients were selected for the study based on inclusion and exclusion criteria. Most of the subjects included in the study were males and belonged to the age group mostly of 50-59 followed by 60-69 years with a mean age of 59.55. This is almost similar to the study performed by **Melo Filho MR de et al.,[12]** where on majority of the study subjects were males and the mean age were 57 years.

Out of the 25 study subjects, patients were having the risk factor of smoking, alcohol consumption, Tobacco chewing habit and also some patents were found to have no exposure to any risk factors. It was found to be almost similar to the study conducted by **Melo Filho MR de et al.,[12]** where majority were exposed to risk factors in which smoking and alcohol consumption habits were most seen.

All the 25 subjects were administered with the study tool EORTC Questionnaire and found to have a Global health status as 52.66(20.64) linear score which is in terms of 100. The Physical functional scale was 64.26(23.49), Role function was 71.61(27.16), Emotional function was 75.61(25.29), Cognitive function was 82.27(25.47) and social function was 80.27(23.64). It is almost similar to the study conducted by **van Nieuwenhuizen AJ et al.,[13]** where it was found to be have a Global health status of 66.6(22.3).

The Physical functional scale was 82.3(20.4), Role function was 73.4(32.3), Emotional function was 68.3(23.4), Cognitive function was 85.1(20.9) and social function was 82.4(24.6).

Treatment regimen for Head and Neck Cancer in ESI-MC PGIMSR & MH, was found to be related to the Staging and Grading of the cancer. According to the anatomical location, Surgery and RT is recommended. Therapy can also be combination of radiation and chemotherapy or surgery according to the disease severity.

In this hospital the chemotherapy recommended for HNC is cytotoxic therapy under the class of Platinum coordinate complex and Taxanes. The most common drugs used under these classes are Cisplatin, Carboplatin and Paclitaxel, Docetaxel.

Out of 25 patents, 15,60% was prescribed with chemotherapy and 5,20% was prescribed with RT. Patients undergoing chemotherapy was prescribed with Cisplatin in which Cisplatin 55mg, Cisplatin 60mg and Cisplatin 70mg. Carboplatin (150mg,190mg, 200mg,400mg,500mg) and Paclitaxel (140mg and 250mg), Docetaxel(100mg). Paclitaxel and Docetaxel is given as dual therapy with Carboplatin. This treatment regimen was similar to the study conducted by **Khadela A et al.,[14]** Chemotherapy agents prescribed to the patients included cisplatin, paclitaxel, and carboplatin. Platinum analogs and taxanes were highly prescribed chemotherapy agents as they are highly effective in HNSCC.

To prevent chemotherapy-induced cytotoxicity, supportive care agents, such as anti-emetics, proton pump inhibitors, anti-infective agents, and colony-stimulating factors, were used along with miscellaneous supplements which was similar to the study conducted by **Khadela A et al.,[14]**

These drugs are listed under NLEM and also given as per NCCN guidelines. It was also observed that there was death of three sample subjects during the study period. In which 2 of them were due to the increased severity of the disease and one patient was due to unknown cause.

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