Quality of Life of Patients with Oral and Pharyngeal Malignancies


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ABSTRACT

The target population was cases of oral and pharyngeal cancer in Alexandria and El Behira regions. Data were collected through all accessible archives. Data about quality of life (QoL) were collected through interviewing 171 subjects using the Arabic version of “Functional Living Interview Questionnaire for Cancer” (FLIC). It consists of 22 items translated into Arabic language, and was checked for reliability and validity. Only 12 questions were found suitable for use after testing the questionnaire. Responses are coded on a 7 point Likert scale. Questions included pain, psychic stress, and ability to work and do household activities. The initial scale’s structure identified a two-factor model: functional including 6 questions, and psychological including 6 questions. The grand total score was calculated as the sum of responses to the 12 items. The total score of the scale range is 12 to 84 points. The median was used for demarcation between what was considered as “good” response, and what was considered as “poor” QoL. Quality of life displayed higher “good” frequencies among those 30-60 years old. Males, and rural cases expressed better QoL than females and urban. Married were of better QoL compared to single patients. The educated showed higher frequency of “good” compared to un-educated. Employees and

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professionals reported better QoL. Stage categories showed significant indirect correlation with QoL scores. The best QoL according to total or psychological mean scores was recorded for pharyngeal-otherwise (pharyngeal of a mysterious origin) or lip cases, while the worst were for the floor of the mouth. Lip cases showed the best QoL scores through the functional domain. According to treatment; surgery showed the best QoL, while chemotherapy showed the worst. When it came to chronic irradiation complications; those without complications expressed the best QoL. All those treatment complications showed significant associations with dichotomous leveling of QoL. Logistic regression showed that stage, late surgical complications, and response to treatment were the most important predictors of QoL.

**Keywords:** Cancer, functional living interview for cancer (FLIC), oral, pharyngeal, quality of life.

**INTRODUCTION**

The long-term survival of cancer patients has risen dramatically during the last few decades, yet little is known about the QoL experienced by the survivors; especially of those in groups not represented in published QoL studies, and little is known about what kinds of support survivors want.\(^{(1)}\) The main goal is when discussing QoL of a cancer patient is to return as far as possible, to normality for that patient, not an ideal of a perfect QoL.\(^{(2)}\) QoL assessment was suggested to characterize the burden created by cancer or its treatment, to select between treatments, and make policy decisions.\(^{(3)}\) Clinicians and policymakers are recognizing the importance of measuring health related quality of life (HRQL) to inform patient management and policy decisions.\(^{(4)}\) Generic QoL measures consist of self reported ratings that take into account the following areas of the person’s life: functional status, physical well-being, social functioning,
and emotional with spiritual well-being. Physical, cognitive, or language barriers may make patient-based QoL evaluation difficult on specific groups of patients.

The objective of the study is to get a tool for measuring QoL of cancer patients, and using it to unveil the correlations, associations with socio-economic variables, stage, and treatment. Research also intended to explore the prognostic variables for better QoL.

MATERIALS AND METHODS

Study setting

The study was conducted in the Oncology Department-Faculty of Medicine, Maxillo-facial Department-Faculty of dentistry, and Statistics Department-Medical Research Institute (all from Alexandria University), Oncology Department-Gamal Abdel Nasser Health Insurance hospital, and Damanhour Oncology Center (both from Ministry of Health and Population).

Study design

- A retrospective study for 10 years (1991-2000) was conducted in oncology centers for all oral and pharyngeal malignancy records.
- A prospective study for QoL and response was done from the 1st. January 2001 up to the end of March 2002.

Target population

The target population was oral and pharyngeal cancer cases of Alexandria and El Behira regions.

Data collection methods

1- Record review:
a) The records in the “Cancer Registry” at the Medical Research Institute were studied to get an initial idea about the size and distribution of cases in the region.

b) All accessible files of oral and pharyngeal malignancies were reviewed in Alexandria University hospitals, Gamal Abdel Nasser Insurance hospital, and in Damanhour Oncology center.

2- Follow up:
Follow up was carried mainly through the records and monthly regular clinic visits of the patients; also through telephone calls, letters, relatives, and home visits. Accessible cases of follow up were 852; nevertheless those who participated in filling QoL questionnaires were 171 subjects.

Data collection tool:
Available data were collected, while missing data were sought to be completed by personal communications with patients or their families. Data available were collected using a pre-designed data collection sheet including:

- **Clinic name**
- **Personal history:** patient name, phone number, address if available, socio-demographic data (age, gender, residence, educational level, occupation, and marital status), smoking habit (number of cigarettes smoked daily, and duration of smoking, ex-smokers). Those having a history of smoking before one year of diagnosis or more, and those who smoke less than 10 cigarettes were considered light smokers.

- **Data about oral and pharyngeal cancer:**
  a. Date of diagnosis.
  b. Site of cancer according to ICD-10 (7) classification (including major salivary glands).
  c. Stage of the tumor (8) according to TNM classification.
d. Grade of the tumor, including three grades according to degree of cell differentiation.

e. Main treatment line. Broad lines of treatment were: surgical irradiation, chemotherapy, or their combinations. Also salvage or palliation was recorded as well.

f. Complications:
   - Post operative complications: Included data about recurrence, failure of the flap, limited mouth opening, inadequate swallowing, inadequate mastication, and inadequate articulation.
   - Post irradiation complications: Included fistulae, xerostomia, loss of taste, restriction of movement, osteo-and dento-radio necrosis, subcutaneous fibrosis, mucosal and skin changes, dysphagia, and odynophagia.

- **Response:** complete response, partial, no response, or progressive disease.
- **Data about survival**

**Statistical design:**

Data were entered coded, as a “Foxpro” database file. The “SPSS”- version 11 was used for data analysis.

**Statistical analysis:**

Distribution of the scale response of the sample of “FLIC”-Arabic version, and the sample for QoL assessment were tested through:

i) Computing moment coefficient of skewness.

ii) Kolmogrov and Smirnov one sample test to examine the goodness of fit to the normal distribution.
The scale did not follow the normal distribution, hence nonparametric statistics were performed for reliability and validity which started by Spearman’s correlation coefficient.

Scoring of the scales number 1, 3, 10, 12, 13, 14, 16, 17, 19, 20, 21, and 22 were reversed to make the tool of consistent opinion polarity.

1- Reliability

Reliability of the scale was assessed in terms of internal consistency. Correlation matrix for all items was studied initially; accordingly sites of weak correlations were explored. To reach the minimal acceptable “Determinant” of 0.00001 we decided to cancel the items no. 2, 4, 5, 6, 7, 8, 9, 11, 15, and 18.

2- Validity

Construct validity: principal component factor analysis with Varimax Rotation technique was carried out to estimate factorial validity, which is a type of construct validity of the Arabic translated “FLIC” questionnaire, in which squared multiple correlation was used as the prior communality estimates and Kaiser’s criterion applied (Eigen value> 1 extration), where the eigen value is the total variance explained by each variable.9,10

3- Assessment of quality of life among all cases:

A. Arithmetic mean, standard deviation, median, and skewness of quality of life scores were used for quantitative data of the scale and subscale items. The arithmetic mean, standard deviation, and median were displayed according to site, stage, surgical technique, and chronic irradiation complications regarding function, psychology, and total quality of life scores. Total quality of life
scores were graphically represented for site, stage, chronic irradiation complications, and response.

B. Cross tabulations were executed, and association was tested between socio-demographic characteristics, smoking habit, and clinical profile items against a dichotomous variable of “good” or “poor” quality of life, where the median was the line of demarcation. The $\chi^2$ test was utilized.

C. For comparison of several independent groups, the H test of Kruskal Wallis was adopted.

D. Logistic regression analysis\(^{[11]}\): is a powerful statistical tool for estimating the magnitude of the association between the exposure and a binary outcome (y), i.e. a variable with two possible values (0,1).

$y = 0$ for individuals of the good quality of life.

$y = 1$ for individuals of the poor quality of life.

The dependant variable is mathematically altered or transformed (logit transformation). Simple logistic regression was executed first, then stepwise followed using statistically significant exposures. Stepwise logistic regression analysis using the forward procedure was performed to select the different factors affecting the quality of life.

**Logistic regression model**

It gives the probability of the outcome as an exponential function of the independent variables.

$Y$: Dependent variable (good = 0; or poor =1).

$e^{\text{[exp]}}$: indicates that the base of the natural logarithm is taken to the power shown in the parenthesis.
Y = \frac{1}{1 + e^{-(\alpha + b_1x_1 + b_2x_2 + b_3x_3 + \ldots + b_nx_n)}}

\alpha: Regression intercept or constant. It represents the log odds when all explanatory variables are zero.

B: The logistic regression coefficient denotes the magnitude of the increase or decrease in the log odds produced by one unit of change in the value of the independent variable, holding all other explanatory variables constant.

B...Bn: The respective coefficient for each of the independent variables.

RESULTS

Table (1) shows the reliability of the Arabic translated “FLIC” questionnaire. The mean and standard deviation of the total items score were 60.22 ± 23.82 Likert scale points; that ranged from 12 to 84. The items means ranged from 4.66 ± 2.55 in the question inquiring about the degree patient rates how often depression inflicts him compared to normal, to 5.68 ± 1.95 in the question about how well the patients appeared that day.

Reliability in terms of internal consistency was acceptable as Cronbach’s alpha for the total scale = 0.96; and for each item it ranged from 0.86 in the question about patient rating of his satisfaction with his work and jobs around the house in the last month, to 0.95 in the question inquiring about how well patients felt that day.

Guttman split-half reliability test was also excellent (Chronbach’s alpha = 0.95).

A significantly acceptable spearman’s correlation coefficient was observed for almost all items as correlated to the total score. The lowest correlation value (0.75) belonged to the question
about the degree of pain or discomfort over the previous two weeks due to cancer, while the highest correlation (0.89) was bound to the question about wellness patient felt that day.

Factor analysis shows the principal components factor analysis with varimax rotation of the 12 items of FLIC-QoL. Two factors were extracted with eigen values about 1.00 (Eigen values = 8.18, 7.97, and 0.755 respectively). The two factors accounted for 74.479 % of the total variance. Factor 1 (function), which included items number 10-13-16-19-21, and 22, accounted for 68.19 % of the total variance. The total variance owed 6.29 % to factor two (psychology), which included items number 1-2-12-14-17, and 20. Communality in general was highest (0.842) for inquiry about the feeling of discomfort that day, and for the question inquiry about the patient’s feeling that day, which belonged to psychology domain, while the lowest (0.622) was related to the question dealing with the rate of satisfaction of the patient with his work and jobs, which belonged to functional domain. Functional domain contained 5 questions above 0.7. The psychic domain included 5 questions above 0.7, while the 6th recorded communality of 0.662 which inquires about the degree of wellness patient appeared that day.

The table illustrates for the 12 scales of the FLIC-QoL on two factors. In the first factor, the functional, which included 6 items; the question relevant to the highest loading (0.844) was dealing with the state of wellness of the patient to make a meal or do a minor household repairs, while the lowest loading concerned the rate of feeling with depression compared to normal. Functional domain showed loading values of 0.773, 0.757, and 0.735, in questions dealing with the degree of coping of the patient with his every day stress; rate of satisfaction with
his work and jobs, and degree of pain or discomfort interfering with his daily activities respectively.

The second factor, psychology, included 6 items with factor loading ranging from 0.614 which stands for the question about patient’s wellness that day, to 0.822 which represents the question inquiring about the time patient spent thinking about his illness. The six’s psychology items were of rotational loading above 0.6.

Assessment of Quality of Life

Quality of life as “good” and “poor” were nearly of equal percentages in the whole sample of study (49.1. and 50.9 respectively).
Factors affecting quality of life

A) Socio-demographic characteristics and clinical profile:

Table (2) displays the distribution of studied cases according to socio-demographic characteristics, clinical profile and QoL. The highest percentage of poor quality of life was found among patients aged < 30 years (60%), followed by those aged 60 years or more. From the gender aspect, females followed poorer QoL compared to males (57.7% and 46% respectively). Residence showed poorer rural cases (52.5%) compared to urban cases (49.4%). The worst quality was demonstrated in single patients (57.1%), followed by widowed or divorced (54.8%), while married had the best QoL for they recorded 49.2% “poor”. Educated cases revealed better QoL compared to the un-educated (41.7% compared to 52.4% as “poor” respectively). For QoL in relation with the occupation, the “not-working” category showed the poorer QoL (55.4% as “poor”). None of the previously studied variables showed statistically significant association.

The table reveals also quality of life as “good” and “poor” according to site and stage of the tumor: 53.5% to oral cases, and only 42.9% of pharyngeal cases had poor quality of life. No significant association was detected between levels of QoL for cases having cancer at different sites. Stages displayed marked poor QoL in cases with stage III (73%), followed by stage IV (57.7%). The lowest percentages were found in cases with stage I and II (30.4% and 53.6% respectively). The relationship between levels of QoL and stages was statistically significant ($\chi^2 = 11.2$, $p < 0.05$).

<table>
<thead>
<tr>
<th>Socio-demographic Characteristics</th>
<th>Good QOL</th>
<th>Poor QOL</th>
<th>Total (n=171)</th>
<th>Test of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 30</td>
<td>9</td>
<td>14</td>
<td>23</td>
<td>100</td>
</tr>
<tr>
<td>30-</td>
<td>53</td>
<td>48</td>
<td>101</td>
<td>100</td>
</tr>
<tr>
<td>Mean±S.D.= 50.33±16.44</td>
<td>22</td>
<td>25</td>
<td>47</td>
<td>100</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
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<tr>
<td>Male</td>
<td>54</td>
<td>46</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Female</td>
<td>30</td>
<td>41</td>
<td>71</td>
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<td>Residence</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Urban</td>
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<td>44</td>
<td>89</td>
<td>100</td>
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<tr>
<td>Rural</td>
<td>39</td>
<td>43</td>
<td>82</td>
<td>100</td>
</tr>
<tr>
<td>Marital Status</td>
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<tr>
<td>Married</td>
<td>64</td>
<td>62</td>
<td>126</td>
<td>100</td>
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<tr>
<td>Widow, Divorced</td>
<td>14</td>
<td>17</td>
<td>31</td>
<td>100</td>
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<tr>
<td>Single</td>
<td>6</td>
<td>8</td>
<td>14</td>
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<tr>
<td>Education</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Educated</td>
<td>14</td>
<td>10</td>
<td>24</td>
<td>100</td>
</tr>
<tr>
<td>Non-educated</td>
<td>70</td>
<td>77</td>
<td>147</td>
<td>100</td>
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<td>Occupation</td>
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<tr>
<td>Working</td>
<td>47</td>
<td>41</td>
<td>88</td>
<td>100</td>
</tr>
<tr>
<td>Not Working</td>
<td>37</td>
<td>46</td>
<td>83</td>
<td>100</td>
</tr>
<tr>
<td>Site</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Oral</td>
<td>60</td>
<td>69</td>
<td>129</td>
<td>100</td>
</tr>
<tr>
<td>Pharyngeal</td>
<td>24</td>
<td>18</td>
<td>42</td>
<td>100</td>
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<tr>
<td>Stage°</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Stage I</td>
<td>16</td>
<td>7</td>
<td>23</td>
<td>100</td>
</tr>
<tr>
<td>Stage II</td>
<td>13</td>
<td>15</td>
<td>28</td>
<td>100</td>
</tr>
<tr>
<td>Stage III</td>
<td>10</td>
<td>27</td>
<td>37</td>
<td>100</td>
</tr>
<tr>
<td>Stage IV</td>
<td>52</td>
<td>71</td>
<td>123</td>
<td>100</td>
</tr>
</tbody>
</table>

° Excluding 48 patients whose stage of the tumor was not recorded
B) Response:

Figure (1) reveals an apparent association between response and QoL scores as “good” and “poor”. Cases with progressive disease showed 76 % as “poor” quality of life, those who had partial response recorded 65.2 % as “poor” quality of life. On the other hand, 62 % of cases with complete response showed good quality of life score. The box-plot displayed a conspicuous picture to total quality of life according to response. It showed that the median total score in complete responses was higher (77.5) than partial response where the median was 49.5, but median in those with progressive cancer was 40  ($\chi^2 = 16.73$, $p < 0.01$).

![Box-plot of Total QoL Score among Oral and Pharyngeal Cases According to Response (Alexandria and El Behira, 1991 - 2000)](image)

Figure (1): Box-plot of Total QoL Score among Oral and Pharyngeal Cases According to Response (Alexandria and El Behira, 1991 - 2000)
Figure (2) shows that quality of life median scores were lowest in case of the floor of the mouth, other parts of the mouth, as well as the oro-pharynx. The best were seen with the nasopharynx, lip, and major salivary gland. It showed highest total mean score through the pharynx-otherwise cases (70 ± 9.9) followed by the lip (69.75 ± 20.57), and a high most median in the lip, and nasopharynx (78) followed by the major salivary glands (76). The lowest total scores were in the floor of the mouth (55.67 ± 22.13), median of 51.5.

![Figure (2): Box-plot of Total QoL Score among Oral and Pharyngeal Cases According to Site (Alexandria and El Behira, 1991-2000)](image)

Figure (3) displays obvious inverse relationship of medians in total quality of life scores with stage. Regarding stages; it was interesting to see decreasing total scores from stage I to stage IV.
(68.65 ± 19.91, median 78 to 48.84 ± 23.13, median 46). There was a significant difference between mean total score of QoL regarding total, and functional scores of stage I, and IV. Stage I was shown to be different from stage III through the psychology and total scores. Psychology domain and the total scores showed significant difference between stages II and IV.

![Box-plot of Total QoL Score among Oral and Pharyngeal Cases According to Stage (Alexandria and El Behira, 1991-2000)](image)

**Figure (3): Box-plot of Total QoL Score among Oral and Pharyngeal Cases According to Stage (Alexandria and El Behira, 1991-2000)**

C) Treatment and type of surgery:

Table (3) reveals that poor quality of life was less detected among patients who received surgery than among all other modalities (41.4). Good quality of life was more obvious among patients exposed to excisional surgery (59.7%), while the majority of patients who were exposed to radical neck dissection and safety margin had poor quality of life (65.2%, and 60.7% respectively). Neither treatment modalities nor the type of surgery showed significant difference regarding quality of life.
Table (4) shows the mean and standard deviation for both domain scores with the type of surgery, where the total quality of life scores among cases exposed to excisional type of surgery was the highest among all totals (63.63), and the median was 77. In general, safety margin revealed the lowest quality of life score along domains and the total. Total safety margin mean was 52.86 ± 26.47 and the median was 61. Functional domain mean scores among cases exposed to excisional, safety margin, and radical neck dissection techniques of surgery were close to each other with a total of 29.77 ± 12.68 (6 items). None of the surgical types combinations showed significant statistical difference according to Kruskal-Wallis test.

The differences of domains scores according to post irradiation complications were revealed, in addition to the differences between total quality of life scores according to complications themselves. The total quality of life mean scores ranged from 52.94 ± 26.66 among patients with other complications to 70.66 ± 18.09 among those without complications, and the difference was statistically significant (H = 10.89, p < 0.05). The functional domain showed 52.74 ± 14.67 as a mean quality of life score in case of other complications, and 35.66 ± 8.77 in case of no complications, as medians were 29 and 39 respectively, and there was significant statistical difference between the quality of life among these groups (H = 11.3, p < 0.05). The psychological domain revealed also a significant statistical difference among cases without complications and cases having other complications (H = 7.92, p < 0.05), as their mean quality of life scores where 35 ± 10.48, and 27.2 ± 12.74 respectively.
According to simple logistic regression, variables which had significant relation to poor quality of life were stage and treatment complications. Stage IV cases had 4 times the risk of developing poor quality of life as compared to cases of stage I, and stage three had nearly 2.3 times the risk of developing poor quality of life compared with grade I. Those who had late surgical complications also manifested 4 times the risk of poor quality of life in comparison to those without any surgical complications. The existence of chronic irradiation complications revealed about 3.3 times risk compared with those without such complications. A high risk of bad quality of life was found among cases with bad response to treatment (2.5 times the risk among cases as good).

<table>
<thead>
<tr>
<th>Type of surgery</th>
<th>Functional</th>
<th>Psychological</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range= 6 to 42</td>
<td>Range= 6 to 42</td>
<td>Range= 12 to 84</td>
</tr>
<tr>
<td></td>
<td>Mean ± S.D. (median)</td>
<td>Mean ± S.D. (median)</td>
<td>Mean ± S.D. (median)</td>
</tr>
<tr>
<td>Excisional</td>
<td>31.43 ± 12.02 (36)</td>
<td>32.19 ± 12.09(40)</td>
<td>63.63 ± 23.41 (77)</td>
</tr>
<tr>
<td>Radical neck dissection</td>
<td>32.65 ± 9.34 (34)</td>
<td>30.13 ± 9.3 (30)</td>
<td>62.78 ± 17.05 (84)</td>
</tr>
<tr>
<td>Total</td>
<td>29.77 ± 12.68 (35)</td>
<td>30.45 ± 12.40 (34)</td>
<td>60.22 ± 23.62 (59.5)</td>
</tr>
<tr>
<td>H</td>
<td>H = 3.85</td>
<td>H = 0.944</td>
<td>H = 0.95</td>
</tr>
</tbody>
</table>

| Chronic Complications                  | Functional | Psychological | Total |
|                                        | Range= 6 to 42 | Range= 6 to 42 | Range= 12 to 84 |
|                                        | Mean ± S.D. (median) | Mean ± S.D. (median) | Mean ± S.D. (median) |
| No Complications                       | 35.66 ± 8.77 (39)● | 35 ± 10.48 (39) | 70.66 ± 18.09 (78) □ |
| Range                                  | 6 _42             | 7 _42           | 16 _84           |
| Osseo_dento_radio necrosis             | 28.81 ± 12.18 (33) | 28.89 ± 12.42 (30) | 57.69 ± 23.6 (61.5) |
| Range                                  | 6 _42             | 6 _42           | 12 _84           |
| Other Complications                    | 52.74 ± 14.67 (29) | 27.20 ± 12.74(28) | 52.94 ± 26.66 (52) |
| Range                                  | 6 _42             | 6 _42           | 12 _84           |
| Total                                  | 29.64 ± 13.01 (36) | 30.06 ± 12.37 (33) | 59.7 ± 24.46 (71) |
| H                                      | H = 11.30         | H = 7.92        | H = 10.89        |

□ No complications versus other complications, p < 0.05.
● No complications versus other complications, p < 0.05.
Table (5) shows that stepwise logistic regression delineated three predictors for poor QoL: stage and late surgical complications as well as response. The first and best predictor was late surgical complications, which showed about 4.4 times the risk of having poor quality of life relative to those without such complications (95% C.L. = 1.62 - 11.734). The second was response, where subjects having bad response revealed about three times the risk of having poor quality of life compared to those with complete response (95% C.L. = 1.62 - 11.39). The model $\chi^2$ for the best variables is 30.66, $p<0.01$. The equation describing the relationship between dichotomus levels of quality of life and significant independent variables is as follows:

$$Y = \frac{1}{1 + e^{-(2.383 + (-0.467x_0) + (-1.472x_{11}) + (1.139x_{13})}}}$$

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>B</th>
<th>SE</th>
<th>Wald</th>
<th>P</th>
<th>OR</th>
<th>95 % CL UL–LL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>-2.141</td>
<td>0.797</td>
<td>8.106</td>
<td>0.044</td>
<td>0.118</td>
<td>0.025 – 0.560</td>
</tr>
<tr>
<td>III</td>
<td>-1.127</td>
<td>0.664</td>
<td>7.218</td>
<td>0.007</td>
<td>0.324</td>
<td>0.088 – 1.191</td>
</tr>
<tr>
<td>IV</td>
<td>-0.467</td>
<td>0.648</td>
<td>2.880</td>
<td>0.090</td>
<td>0.627</td>
<td>0.176 – 2.233</td>
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<tr>
<td>Late surgical</td>
<td>1.472</td>
<td>0.505</td>
<td>8.499</td>
<td>0.004</td>
<td>4.36</td>
<td>1.62 – 11.734</td>
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<tr>
<td>complications</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Response (bad response)</td>
<td>1.139</td>
<td>0.398</td>
<td>8.175</td>
<td>0.004</td>
<td>3.123</td>
<td>1.62 – 11.37</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.383</td>
<td>0.694</td>
<td>11.802</td>
<td>0.001</td>
<td>0.092</td>
<td></td>
</tr>
</tbody>
</table>

(Model $\chi^2 = 30.66, p < 0.01$)

**DISCUSSION**

The development and application of adequate tools to measure QoL may substantially enhance the clinical trials process. (12) Schipper et al., (1984) indicated that we would likely find it impossible to derive enough philosophic-demographic homogeneity to make meaningful comparisons. Similarly, it is unlikely that QoL can be measured against some external standard. One man’s success is often another’s failure. However by using subjects as their own controls one can circumvent the problem of patient in-homogeneity and the absolute standardization in one step. (13) Like this research; overall in the
literature, many studies are cross-sectional rather than longitudinal and most are retrospective. Few reports include a sample size of over 100 patients. There was a hope that QoL assessments would be used in conjunction with clinical trials so that evaluation of the outcomes would be broadened to include both the quality and the length of survival and that the patient and family would be involved in the selection of treatment. This issue is of central interest in both policy implementation and application.

Factors affecting quality of life:

The association between levels of QoL as “good” or “poor” according to variant personal and medical aspects was investigated.

Socio-demographic characteristics:

The proportion of males to females in the sample was 1.4, which is close to the world sex ratio (1.3). Consequently females were well represented, but they showed more fragility regarding QoL. Age intervals had a peak of frequency relevant to 30-<60 years old patients, and that was in the favor of collecting data, as we would expect the QoL domains full sphere to be expressed. The best QoL score was revealed in association with the 30-<60 years age groups, which may be the age interval of less anxiety. Urban including sub-urban cases were more than rural. Rural subjects being simple and spontaneous displayed a worse QoL. According to Talmi QoL is not universally defined, and may vary among cultures and even among patterns of socioeconomic level, which could be applied to this study if we remember that non-urban cases represented more than 2/3rds of total cases, which is the category of higher sociality in our country. Those married showed the best QoL followed by
widowed and divorced who confronted unexpectedly a big percent. The QoL sample according to education or occupation showed that educated and employee with professional had the best QoL.

**Clinical Profile and QoL:**

Upon studying the site of the disease; QoL total score of those of the oro-pharyngeal tumors was better than that of the floor of the mouth. Oro-pharynx in turn was lower than QoL of the gum, other parts of the mouth, or tongue. Functional lip QoL domain score recorded the highest peak. Analysis showed cases of the floor of the mouth, with oro-pharynx as well as those of the other oral sites, tongue, and gum to be of poorer QoL scores, and that sounded logical. Patients with alveolar ridge tumors including floor of the mouth had reduced speech scores and problems with oral mucosa hygiene following treatment.\(^{(15)}\) This was consistent with the present data of QoL which showed the greatest frequency of cases with poor QoL in case of the gum, floor of the mouth, and other oral sites as the frequency of these cases accounted for more than half the total.

A very clear picture was shown by an escalating poor QoL directly with the higher stage of the tumor. An apparent increase of signs of poor QoL with advance of stage number is well known, as this was approved by many researches.\(^{(14,16)}\) Analysis of variance revealed significant difference between domains and total scores in different stages of the tumors. Stage of the disease appeared to have the strongest impact on QoL.\(^{(14)}\)

There was also independent association between stages and scoring levels determined as "good" and "poor". Psychological difference may reflect the social impact indirectly, but there could be cultural and ideological background in both the patient
and his neighbors. Patients of naso-pharyngeal cancer were treated without surgery; so their problems were not perceived as acute as problems of oral and other pharyngeal sites.

QoL should be included in trials of medical and psychological interventions as a correction factor in calculating the survival data.\textsuperscript{(16)} In this study irradiation, surgery, and both together respectively were associated relatively with higher QoL scores. This could be due to the stage of the patient disease, and the expected prognosis, where still domains supervene others, as also perspectives of persons differ and cancellation effect influences scores. Although no association was revealed between treatment modalities and QoL score levels as “Good” and “Poor”; nevertheless it was noticed that cases who had irradiation or surgery were considerably better than cases who had the two lines together. A decreasing order of survival was for surgery followed by surgery with irradiation; then irradiation alone.\textsuperscript{(17)} It has been estimated that the majority of cancer patients die without adequate relief of pain.\textsuperscript{(18)} Those who received irradiation with surgery in this study were 93 cases. In advanced stage (III and IV) oral squamous cell carcinoma (SCC); a combination of surgery and radiation therapy provides the best survival, although this increases the complications and morbidity.\textsuperscript{(15)} Gotay in her review (1988) addressed that the same treatment that have enabled long-term survival, however, can also cause potentially debilitating deficits, ranging from disruption in day-to-day activities to late effects.\textsuperscript{(1)} This, in fact is a main aspect in the QoL perspectives.

The type of surgery is assumed to affect QoL. Surgical expertise is an independent prognostic factor in the survival of cancer patients.\textsuperscript{(19)} Upon studying QoL according to surgery type;
excision was of higher (better) scores in comparison to safety margin or lymph node involvement techniques along with all domains and also total scores. It could be due to less violation to tissues, as well as response felt by patient himself, and the expertise of the offending surgeons with radiologists. While disfigurement may be considerable in head and neck cancer patients, and affects QoL, it is usually less pronounced in patients with oral cancer except for selected cases.\textsuperscript{14}

\textit{Smoking:}

Smokers were about 40\%, and 25\% were heavy smokers. Light smokers showed the best QoL followed by heavy smokers. It might have been a matter of health care anxiety experienced by non-smokers opposed by a degree of carelessness practiced by smokers.

\textit{Complications:}

Surgery, and chronic irradiation complications were not explained exactly in a selective way as most cases followed different lines of treatment, so the impact of chemical, irradiation, and surgical treatment was not assessed separately. Chemotherapy and irradiation may be directly toxic to the oral mucosa, resulting in dysgeusia, extensive ulceration, pain, bleeding, and compromised normal function. The dental/peri-apical, periodontal, or salivary gland tissues may suffer acute injury. Radiotherapy can cause both serious destruction to bone and permanent salivary gland disturbances.\textsuperscript{20} Cases without complications showed significant difference from cases having other complications, not including Osseo_dento_Radio-necrosis, across the total QoL score ($p < 0.01$), total functional domain score ($p < 0.01$), and total psychology domain score ($p < 0.05$).
There was an association between dichotomas levels of QoL and stomatitis or pain.

Response:

QoL domains showed a conspicuous association with response (p <0.001). Multiple logistic regression analysis showed that stage, late surgical complications, and response were the best predictors of quality of life. Contrary to that real indicator, the prognostic importance of the clinical, pathological, and biological aspects of oral cancer have been investigated, the results of these studies have often been conflicting.(21) The successful pain management requires treatment of all physical, social, and spiritual aspects associated with pain.(18)

In a very similar research to the present one; 135 patients were reviewed following primary surgery to the floor of the mouth and adjacent areas. This study (18) was not exclusive to long-term survivors, however the average post-operative interval was 54 months. Their results suggested that QoL as measured by the Functional Living Index-Cancer (FLIC) was lower in higher stage and patients with bilateral defects with loss of mandible continuity and muco-cutaneous flap reconstructions.

Variant differences in the course of treatment exist, for example: cases dealt with surgically in the Maxillo-facial department “Faculty of Dentistry-Alexandria University” get routinely exposed to bony surgical re-construction flaps. Usually after the operation by a short period or in the same time; implants are used, they provided a very important restoration especially for QoL in general. The increased surgical efforts through the introduction of micro-surgically re-vascularized flap for repair of hard and soft tissue in the head and neck area have
been supposed to lead to a higher QoL after completion of functional rehabilitation.\textsuperscript{(22)}

**CONCLUSION AND RECOMMENDATIONS**

“Functional Living index for Cancer”, as Arabic translated version; proved to be reliable in evaluating functional and the psychological aspects of head and neck cancer patients. Some questions are to be replaced by some simple items to potentate social status evaluation indirectly. Whenever surgery is indicated, and patient is operable; Excision combined with avoiding complications or overcoming them through rehabilitative and palliative strategies is of great effect on quality of life.

Health education should be directed toward the early referral to oncologists, as the earlier the surgery and/or stage were of significant higher survival feedback. Accordingly the later the referral the worse was response and consequently worse quality of life.

There is a hope that QoL assessments would be used in conjunction with clinical trials so that evaluation of the outcomes would be broadened to include both the quality and the length of survival and that the patient and family would be involved in the selection of treatment. This issue is of central interest in both policy implementation and application.

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