

# Correlation between MSTS, TESS and QOL-CSV Scores in Patients with Soft Tissue and Bone Tumours

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## INTRODUCTION:

Limb-sparing surgery in oncology is the preferred treatment when compared with amputation. Although limb salvage surgery provides a more desirable outcome with regards to limb preservation (Farbod Malek *et.al*, 2012; LH Aksnes *et. al* 2008, A Monticelli *et al.* 2014), it still presents a limitation of movement. Thus, the quality of life (QOL) among patients with limb sarcomas is an important factor to consider in the management of these patients as majority of these surgeries renders them incapable of performing their routine tasks. This study aims to investigate the correlation between the standard functional scores such as MSTS and TESS score. vs the QOL of bone cancer survivors.

## METHODS:

Patients with bone and soft tissue tumours (malignant/ benign) on follow up at the Orthopaedic Oncology Clinic at UMMC were considered for the study. Patients chosen consisted of various age, sex, and race. Patients must have had completed the surgical treatment. The functional scores were evaluated using MSTS and TESS tools while quality of life was determined with QOL-CSV tool. IBM SPSS Statistics Version 21 was used to analyze the data obtained.

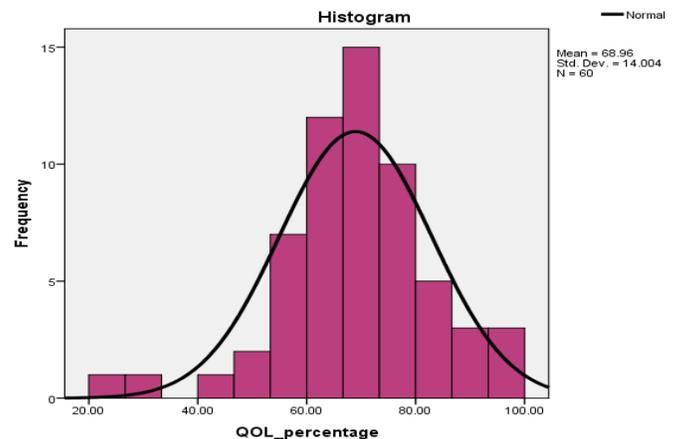
## RESULTS:

The study involved 60 patients, 51.7% were females and 48.3% were males. The Malay patients were recorded the highest percentage (46.7%), followed by Chinese (30.0%) and Indians (23.3%). The highest range of age was 11-20 years old (30%) with a mean of  $32.37 \pm 16.31$ . Most of the patients were diagnosed with osteosarcoma (33.3%), followed by giant cell tumour (30.0%), chondrosarcoma (8.3%), soft tissue sarcomas (6.7%), Ewing's sarcoma (3.3%) and all others (18.7%). The

mean for MSTS score was  $21.18 \pm 6.94$  (range: 3 to 30), TESS score was  $106.29 \pm 24.98$  (range: 39 to 145) and QOL-CSV was  $278.38 \pm 59.92$  (range: 84 to 400).

Table 1: Comparison among MSTS, TESS and QOL-CSV based of satisfaction of limb function and quality of life (all scores were rounded up to 100% for comparison)

Score range,%	MSTS,%	TESS,%	QOL-CSV,%
<b>Good, 80-100</b>	45.0	61.7	18.3
<b>Average, 50-79</b>	38.3	30.0	75.0
<b>Unsatisfactory, &lt;50</b>	16.7	8.3	6.7



Graph 1: Dependant variable, QOL\_CSV is normally distributed, thus parametric test is used in this study.

Table 2: Correlation among MSTS, TESS and QOL-CSV.

Correlation	Pearson coefficient	P value
<b>MSTS-TESS</b>	0.548	<0.01
<b>TESS-QOL_CSV</b>	0.384	<0.01
<b>MSTS-QOL_CSV</b>	0.335	<0.01

\*Correlation is significant at the 0.01 level (2-tailed)

Table 1 show that MSTs and TESS scores have a majority of 'good' response from the patients (45.1% and 61.7% respectively). However, most of the patients gave an 'average' response to QOL\_CSV, where only 18.3% of the patients have a 'good' quality of life, while a majority of 75% patients agreed on having an 'average' quality of life.

Table 2 reveals that all the tools have a positive correlation with significant p values <0.01.

Multiple linear regression model demonstrated that the effect of TESS on QOL was significant ( $p < 0.05$ ) but the effect of MSTs was insignificant. The R-squared value of both MSTs and TESS was 0.17. The R-squared values of MSTs and TESS scores individually were 0.113 and 0.148 respectively.

#### **DISCUSSIONS:**

As per the results, all the tools were shown to correlate well. The correlation between MSTs-TESS (0.548), though only moderate, has the strongest positive correlation when compared with MSTs-QOL\_CSV (0.335) and TESS-QOL\_CSV (0.384). The moderate correlation between MSTs and TESS is supported by a study in 1996 by AM Davis, Wright JG, Williams JI, et.al. This may be due to the purpose of these tools, i.e. to measure limb functions after a surgery.

Further test using the multiple linear regression model which was used to measure the effect of the functional tools (MSTs & TESS) on quality of life (QOL\_CSV) demonstrated that only TESS was significant on QOL\_CSV ( $p < 0.05$ ) while MSTs was insignificant. This makes TESS a better predictor than MSTs on the outcome of QOL\_CSV. The reason may be that both TESS and QOL\_CSV were patient-based study. MSTs is based on the doctor's evaluation of anatomical impairment, hence the measurement may be under- or overestimated. A study by AM Davis in 1999, supports that TESS score is a reliable and efficient measure for monitoring patients and for use in clinical trials. .

R-squared value of the combination of both functional tools is able to explain 17% ( $r^2 = 0.17$ ) on the variation of QOL\_CSV. This value is

slightly higher than the performance of the functional tools individually. This proves that a single functional tool does not reflect on the quality of life of the patients. Therefore, the use of a self-rating scale alongside an 'objective' measurement by a physician is crucial for understanding a patient's outcome (P.U. Tunn, D. Pomraenke & U. Goerling *et.al*, 2007)

#### **CONCLUSION:**

All 3 tools should be taken in consideration when assessing the quality of life of a patient who has undergone surgery for a limb tumour.

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