Table of Contents

Serial number	Heading	Page number
1	Declaration by student	i
2	Certificate of the Supervisor	ii
3	Certificate of Plagiarism	iii
4	Undertaking for Submission of Ph.D. Thesis	xix
5	Certificate of Successful Completion of Viva-Voice of Ph.D.	xx
6	Acknowledgements	xxi
7	List of Figures	xxv
8	List of Tables	xxvi
9	Abbreviations	xxx
10	Abstract	xxxii
11	**Chapter – 1 Introduction**	1
	1.1 Epidemiology of HNSCC	1
	1.2 Overview of treatment in HNSCC	4
	1.3 Malnutrition in HNSCC	5
	1.4 Immunity in HNSCC	7
	1.5 Association between Nutrition and Immunity	9
	1.6 Prognostic factors in treatment of HNSCC	11
	1.7 Need for low cost model	12
	1.8 Aims and Objectives of the study	14
	1.9 Hypothesis	14
12	**Chapter – 2 Review of Literature**	15
	2.1 Nutrition in HNSCC	16
	2.1.A. Factors affecting nutrition	16
	2.1.B. Assessment of nutrition in HNSCC patients	19
	2.1.C. Literature on malnutrition affecting treatment outcomes in HNSCC	22
	2.1.D. Literature on treating malnutrition in HNSCC	24
	2.2 Systemic Immunity in HNSCC	28
	2.2.A. Immunity and HNSCC	28
	2.2.B. Markers used for systemic immunity	30
	2.3. Association between nutritional status and systemic immunity	32
	2.3.A. In cancer	32
	2.3.B. In HNSCC	33
	2.4. Prognostication in HNSCC	35
	2.4.A. Use of novel markers	35
	2.4.B. Use of NLR as a prognostic marker	37
	2.4.C. Use of malnutrition as a prognostic marker	38
13	**Chapter – 3 Materials and Methods**	40
	3.1. Study design	41
	3.2. Study population	41
	3.3. Inclusion and exclusion criteria	41
	3.4. Recruitment	41
	3.5. Evaluation	42

	3.6. The data was collected for the following variables	42
	3.7. The primary end points of the study	43
	3.8. Sampling technique	43
	3.9. Sample size calculation and sample size	43
	3.10. Statistical Analysis	43
	3.11. Definitions, variables and methods	49
14	**Chapter – 3 Results**	51
	4.1. Nutritional profile at baseline	52
	4.2. Systemic immunity at baseline	54
	4.3. Details of treatment, its complications and failure to complete planned treatment	55
	4.4. Nutritional status trend during treatment	56
	4.4.A. Overall group	56
	4.4.B. Node-negative group	56
	4.4.C. Node-positive group	57
	4.4.D. Single versus multi-modality treatment	57
	4.5. Systemic immunity trend during treatment	64
	4.5.A. Overall	64
	4.5.B. Node-negative group	65
	4.5.C. Node-positive group	65
	4.5.D. Single versus multi-modality treatment	65
	4.6. Association between nutritional status and Neutrophil to Lymphocyte ratio	70
	4.6.A. Median NLR at baseline and treatment completion	70
	4.6.B. NLR groups at baseline	71
	4.6.C. NLR groups at treatment completion	71
	4.7. Correlation between nutritional status and Neutrophil to Lymphocyte ratio	77
	4.8. Variables associated with Failure to complete treatment (FailureTxCompletion)	78
	4.9. Variables associated with Grade III complications	83
	4.10. Overall and Progression free survival at 6months after completion of treatment	86
	4.11. Factors associated with Disease Progression at 6months after completion of treatment	87
	4.12. Factors associated with Overall Survival (OS) at 6months after completion of treatment	96
	4.13. Multivariate analysis for factors associated with OS and PFS at 6months after completion of treatment	104
	4.14. ROCs for various variables to predict Failure to complete all planned treatment	105
	4.15. ROCs for various variables to predict Disease progression at 6months	110
	4.16. ROCs for various variables to predict Overall survival at 6months	115
	4.17. Survival Analysis for 6months PFS	119
	4.17.A. Overall group	119
	4.17.B. Node negative group	120
	4.17.C. Node positive group	122
	4.18. Survival Analysis for 6months OS	124

	4.18.A. Overall group	124
	4.18.B. Node-negative group	126
	4.18.C. Node-positive group	127
	4.19. Risk Stratification Model for Failure to Complete all Planned Treatment	129
	4.20. Risk Stratification Model for Disease Progression at 6months	130
	4.21. Risk Stratification Model for Death due to disease at 6months	131
15	**Chapter – 5 Discussion**	133
	5.1 Baseline parameters	134
	5.2 Nutritional profile during treatment	135
	5.3 Systemic immunity profile during treatment	144
	5.4 Association between nutrition and N/L ratio	145
	5.5 Complications, failure to complete all planned treatment	147
	5.6 Nutrition Factors associated with early PFS and OS	152
	5.7 NLR cut-off to predict failure to complete planned treatment, early recurrence and death	159
	5.8 Low cost risk stratification model	166
16	**Chapter – 6 Conclusion**	171
	6.1. Key findings	172
	6.2. Limitations	172
	6.3. Clinical Recommendations	173
17	**Chapter – 7 Summary**	174
	7.1. Study aims	175
	7.2. Hypothesis	175
	7.3. Study design and methodology	175
	7.4. Statistical analysis	176
	7.5. Results	176
	7.6. Conclusion	182
	7.7. Clinical Recommendations	183
18	**Chapter – 8 References**	184
19	Appendices	xxxv
Annexure1	*Written Informed Consent*	xxxvi
Annexure2	*Case recording form*	xxxix
Annexure3	*AJCC 8 schema for TNM staging*	xli
Annexure4	*Subjective Global Assessment Sheet*	xliii
Annexure5	Ethics committee clearance letter	xlv
Annexure6	One Published Research Paper	xlvi
Annexure7	Certificate of two Paper Presentations in Conferences	lvii