



Lower Flourishing Scores Associated with Increased Symptom Burden and Lower Financial Health in Head and Neck Cancer Survivors

Alexandria Harris, MD,MS¹; Jinhong Li, MS²; Karley Atchison, MA¹; Christine Harrison, BS¹; Daniel Hall, MD¹, MHSc; Jonas Johnson, MD¹; Marci Lee Nilsen, PhD, RN^{1,3}

¹University of Pittsburgh, School of Medicine; ²University of Pittsburgh, School of Public Health; ³University of Pittsburgh, School of Nursing

Purpose

- Increasingly intensified treatment regimes for head and neck cancer (HNC) and a younger patient demographic have contributed to a larger survivorship population with long post-treatment courses.
- These treatment- and disease-related toxicities in combination with grief, anxiety, and depression associated with diagnosis can affect the well-being and quality-of-life of patients.
- Recent studies have focused on indices which focus on narrow clinical outcomes and symptoms and fail to address the broad range of affects encompassing life satisfaction.
- Development of the Flourishing Index which measures flourishing around five central domains of life satisfaction, health, meaning and purpose, character and virtue, and social relationships has allowed us to examine how treatment, symptom burden, and financial security impact overall well-being and satisfaction.
- Our study examines the relationship between flourishing and patient-reported, post-treatment symptom burden to understand more about how treatment and toxicity affects survivors’ lives.

Methods

Prospective, cross-sectional survey of 100 HNC survivors collected with patient-reported outcomes (PROs) from the UPMC HNC Survivorship Clinic.

The **Flourishing Index** questionnaire was collected at the time of visit with higher scores indicating higher life satisfaction and wellness. The following PRO questionnaires used to assess symptoms with higher scores indicating more severe symptoms:

- Patient Health Questionnaire (PHQ-8)**
- Generalized Anxiety Disorder (GAD-7)**
- Eating Assessment Tool (EAT10)**
- Neck Disability Index (NDI)**
- Insomnia Severity Index (ISI)**

Inclusion Criteria:

- Treatment Completed
- Squamous Cell Carcinoma
- Carcinoma of the Oral Cavity, Oropharynx, Larynx, and Hypopharynx.

Exclusion Criteria:

- History of Recurrence
- Second Primary Carcinoma
- Distant Metastasis

Analysis: Descriptive statistics used to summarize demographics and clinical characteristics. Univariable and multivariable analyses performed to examine the association between flourishing scores and independent variables. Multivariable regression modeling completed using RStudio.

Demographics and Clinical Characteristics

		Flourishing Scores		
Variables (n=100)		n(%)	Mean±SD	p-value
Marital Status	Living with Partner	70(70%)	79.8±16.5	0.638
	No Current Partner	30(30%)	78.1±17.1	
Sex	Male	86(86%)	79.1±16.7	0.767
	Female	14(14%)	80.5±17.0	
Race	White	88(88%)	79.1±16.7	0.260
	African or Asian American	12(12%)	74.2±23.0	
Functional Oral Intake Scale	1	2(2%)	68.5±0.7	<0.001
	2	7(7%)	64.4±23.8	
	3	9(9%)	80.8±12.1	
	4	3(3%)	77.0±15.4	
	5	15(15%)	75.6±16.8	
	6	43(43%)	79.7±16.7	
	7	20(20%)	87.8±12.8	
Site	Oral Cavity	26(26%)	76.5±19.2	0.449
	Oropharynx	54(54%)	80.4±15.0	
	Larynx/Hypopharynx	20(20%)	81.3±18.2	
Stage	Early	32(32.6%)	82.1±18.3	0.215
	Advanced	66(66.7%)	77.6±15.9	
Treatment Modality	Surgery Alone	6(6%)	78.5±20.7	0.999
	Surgery + Adjuvant	57(57%)	78.5±16.2	
	Non-surgical	37(37%)	80.6±17.1	
HPV Status	Positive	51(53.1%)	79.1±16.6	0.630
	Negative	5(5.2%)	87.6±7.1	
	N/A	40(41.7%)	77.3±17.8	

Univariable Analysis of PROs and Flourishing

		Flourishing Scores	
	Mean±SD	Coefficient	p-value
PHQ-8	7.4±6.0	0.219	<0.001
GAD-7	4.8±6.2	0.196	<0.001
EAT-10	15.4 ±11.8	0.316	<0.001
NDI	10.2±9.3	0.293	<0.001
ISI	7.8±7.1	0.199	<0.001

Univariable Analysis of Financial Health

		n(%)	Mean±SD	p-value
Education	Some High School, Diploma, or GED	34(34.3%)	78.7±19.2	0.611
	Some College or 2-4 Year Degree	49(49.4%)	81.4±15.6	
	Some Graduate or Graduate Degree	16(16.1%)	74.4±14.0	
Occupation	Not Working	48(48.4%)	75.8±17.1	0.040
	Working	51(51.5%)	82.7±15.8	
Income	0-20k	28(28.2%)	72.5±20.2	<0.001
	20-99k	42(42.4%)	81.9±15.1	
	100k+	29(29.2%)	82.8±11.7	
Difficulty paying for needs	Not at all difficult	70(70.7%)	85.1±11.4	<0.001
	Somewhat or Extremely Difficult	29(29.2%)	65.4±19.2	

Results of Multivariable Regression Analysis

Variables		Coefficient (95% CI)	p-value
Intercept		114.88 (92.44, 137.33)	<0.001
FOIS		0.23 (-2.53, 3.00)	0.867
Time since treatment		-0.0059 (-0.058, 0.047)	0.823
AJCC Staging	III-IV	-3.91 (-11.09, 3.27)	0.281
	Tis-II	(Base)	
HPV		0.75 (-1.85, 3.34)	0.567
Occupation	Working	-1.73 (-9.32, 5.86)	0.651
	Not Working	(Base)	
Income	100k+	-3.96(-17.25,9.33)	0.554
	20-99k	-1.70(11.99,8.60)	0.743
	0-20k	(Base)	
Difficulty paying for needs	Somewhat or Extremely Difficult	-18.06(-28.14, -7.98)	<0.001
	Not at all Difficult	(Base)	
PHQ-8 Score		-2.22 (-3.64, -0.80)	<0.001
GAD-7 Score		-0.26 (-1.40, 0.87)	0.644
EAT-10 Score		-0.14 (-0.55, 0.28)	0.518
NDI Score		0.085 (-0.65, 0.82)	0.816
ISI Score		0.48 (-0.35,1.32)	0.255

Summary

- Univariable analysis shows patients with lower flourishing scores also report higher levels of depression, anxiety, neck disability, swallowing dysfunction, and insomnia (p<0.001).
- Patients with increasing depression scores are more likely to have lower flourishing scores(p<0.001).
- Survivors who report difficulty paying for needs also report lower overall flourishing (p<0.001).
- Those who report lower income, those who were employed, and those with lower functional oral intake report lower overall flourishing (p<0.010, and p<0.005).
- Those who were employed reported lower flourishing (p=0.040) though this significance disappeared when controlled for difficulty paying for needs.

Conclusions

- Flourishing is tied with survivor health outcomes and symptom burden.
- Understanding what impacts flourishing following treatment is essential if providers hope to improve the lives of survivors.
- Current research is focused on narrow variables, limiting broad interpretation on survivor well-being and the impact of treatment on the individual.
- Severe dysphagia limiting oral consumption, financial hardship, and depressive symptoms are the most important aspects influencing failure to flourish.
- Negative PRO responses are associated with lower flourishing scores, highlighting the importance of integration of care not only to reduce symptom burden but to improve the overall well-being of the survivors.
- Our data suggests that the life experiences of survivors has been understudied and underreported. The head and neck oncologic community can serve this population through continued research into opportunities to enhance and improve a multitude of outcomes.

Special Thanks

Eye and Ear Foundation
UPMC Head and Neck Survivorship Clinic
University of Pittsburgh School of Medicine