



# A longitudinal study of body weight change in patients receiving radiation therapy for head and neck cancers

Shu-Chiung Lee<sup>1</sup> Tsae-Jyy Wang<sup>2</sup>

Taipei Veterans General Hospital<sup>1</sup>, National Taipei University of Nursing and Health Science<sup>2</sup>, Taiwan ROC

## Introduction

Weight loss is common among patients receiving radiotherapy for head and neck cancers and can compromise their treatment plans and increase their morbidity. Exploring factors related to weight loss during radiotherapy is crucial for developing interventions to prevent body weight loss in this population.

## Purpose

- 1) to describe body weight change over time in patients receiving radiotherapy for head and neck cancers
- 2) to explore the influence of types of nutritional support on weight change over time after controlling for demographic, mucositis and clinical variables.

## Methods

The study was based on a longitudinal design. A convenient sample of 101 head and neck cancer patients scheduled for radiotherapy was recruited from oral surgery or otolaryngology wards, or radiation clinics of a medical center in northern Taiwan. Body weight was assessed using standard scales at baseline (T1), one month after the start of RT (T2), the end of RT (T3), and one month after completion of RT (T4). A generalized estimating equation (GEE) was used to analyze the patients' body weight change over time and explore the influence of nutritional support types on body weight after controlling for demographics, clinical variables, and mucositis severity.

## Results

The patients' average body weight was 69.4 Kg ( $\pm 13.2$ ) at T1, 66.3 ( $\pm 12.0$ ) at T2, 64.5 ( $\pm 11.9$ ) at T3, and 63.4 ( $\pm 10.7$ ) at T4. Figure 1 shows a drastically drop in body weight followed by gradually decrease over time. Results of a GEE showed that the patients' body weight significantly decreased over time. [ $F = 2802.57$ ,  $P < .001$ ] (Table 1). During the course of radiotherapy, the participants' body weight decreased by 4.8 kg ( $\pm 3.8$ ) in average ( $p < .001$ ). As for the influence of types of nutritional support on body weight, results of GEE showed a significant interaction effects of nutritional support by time on body weight after controlling for the patients' height, age, baseline BMI and mucositis (Table 2). Figure 2 show changes in body weight over time among different types of nutritional support.

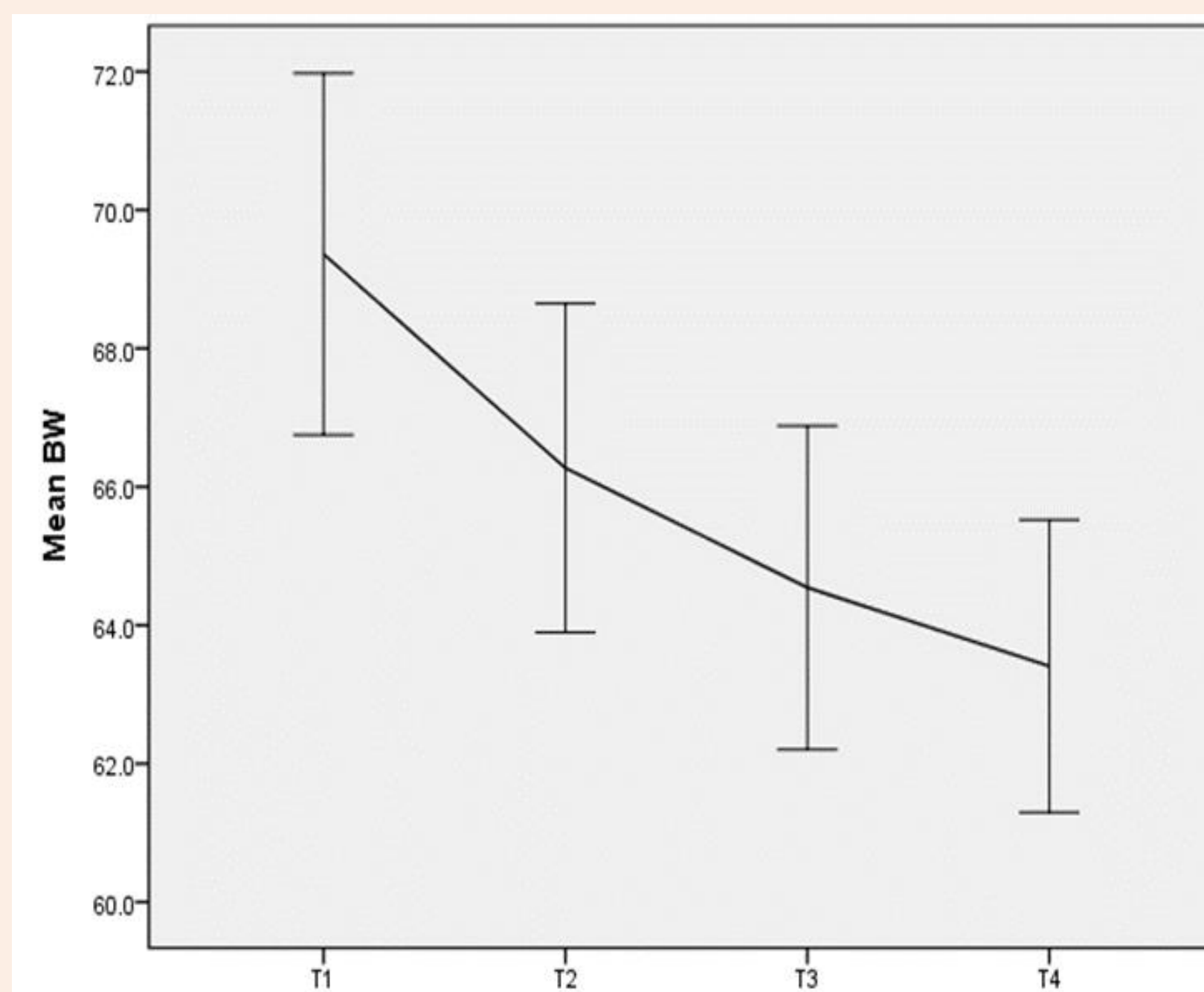


Figure 1. Graphic display of changes in body weight over time.

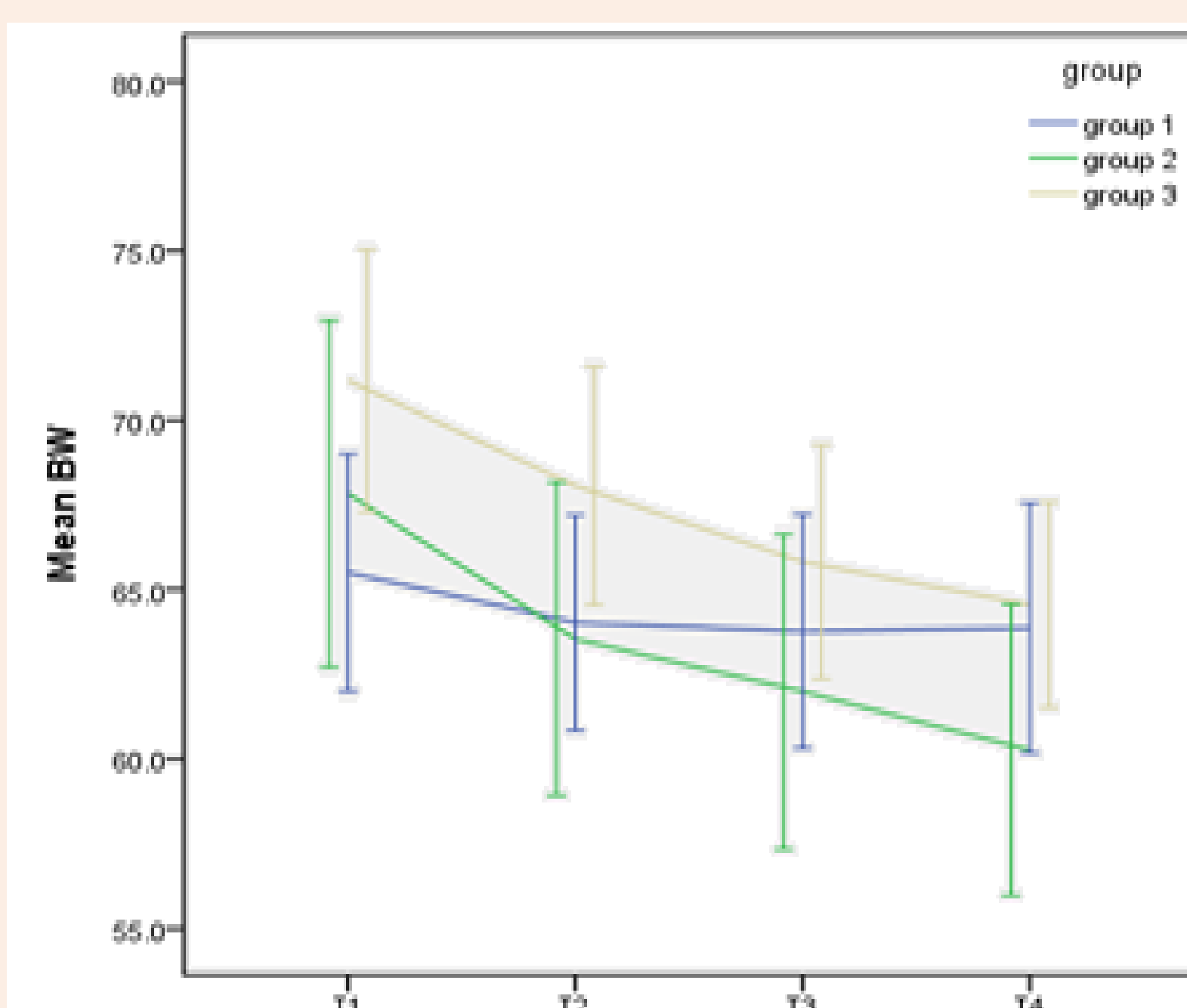


Figure 2. changes in body weight over time among different types of nutritional support.

Table 1. Parameters of the Generalized Linear Model for Body Weight Change Over Time

Parameters	B	SE	95% CI		Wald X <sup>2</sup>	p
			lower	upper		
Intercept	69.36	1.31	66.80	71.93	2802.57	<.001***
T4	-5.96	.51	-6.96	-4.95	134.08	<.001***
T3	-4.82	.38	-5.56	-4.08	163.66	<.001***
T2	-3.09	.28	-3.63	-2.55	125.69	<.001***

Table 2. Generalized Linear Model for the Influences of Types of Nutritional Support on Body Weight

Parameter	B	SE	95% CI		Wald X <sup>2</sup>	p
			Lower	Upper		
(Intercept)	-61.91	20.48	-102.06	-21.76	9.14	.003**
T4	-6.04	.67	-7.35	-4.73	81.54	<.001***
T3	-3.71	.60	-4.88	-2.53	38.13	<.001***
T2	-1.91	.49	-2.88	-.94	14.90	<.001***
group=3	-1.84	1.34	-4.47	.80	1.87	.172
group=2	-2.39	1.62	-5.57	.79	2.17	.141
Mucositis grade 4	-2.34	.66	-3.63	-1.06	12.73	<.001***
Mucositis grade 3	-2.17	.59	-3.32	-1.02	13.68	<.001***
Mucositis grade 2	-1.18	.46	-2.08	-.29	6.66	.010*
Mucositis grade 1	-.90	.44	-1.75	-.05	4.27	.039*
Height	72.85	11.11	51.07	94.62	43.01	<.001***
age	-.08	.08	-.24	.08	.98	.323
Overweight	24.02	1.92	20.25	27.78	156.36	<.001***
Normal weight	10.94	1.77	7.48	14.41	38.27	<.001***
T4 * Group 3	4.71	.86	3.02	6.40	29.73	<.001***
T4 * Group 2	-.44	1.22	-2.83	1.95	.13	.717
T3 * Group 3	3.82	.86	2.14	5.50	19.88	<.001***
T3 * Group 2	-.06	.89	-1.81	1.69	.00	.948
T2 * Group 3	2.01	.72	.60	3.43	7.76	.005**
T2 * Group 2	-.54	.64	-1.79	.71	.72	.397

## Conclusions

The results of the study supported that head and neck cancer patients are at a great risk for body weight loss while receiving radiation therapy. The patients continue loss their body weight up to one month after completion of the radiation therapy. Their nutritional status should be evaluated closely. Special attention should be paid to those who have a higher grade of mucositis. Interestingly, we found that body weight loss more in patients who had oral intake than those who had enteral tube feeding throughout the course of radiation therapy. This finding suggests that enteral tube feeding may provide better nutritional support than oral intake in this group.