



“Ready-to-Eat” texture-modified meals for patients with swallowing difficulty

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INTRODUCTION

The ageing population in Asia is escalating and Singapore is estimated to be the third fastest ageing nation in the world.¹ With advanced age, older adults are likely to experience anatomical and physiological changes in their bodies which includes decline in swallowing function. Dysphagia in older adults is associated with nutritional deficit resulting in morbidity, mortality and increased healthcare cost.² One of the treatments for dysphagia is through modification of food texture to reduce aspiration risks.

The objectives of this study are:

- ❖ To evaluate the effectiveness of nutritionally balanced, culturally appropriate ‘ready-to-eat’ texture-modified meals (TMM) on the dietary intake.
- ❖ To investigate the impact of the meals on the nutritional status of the older institutionalized residents with dysphagia.

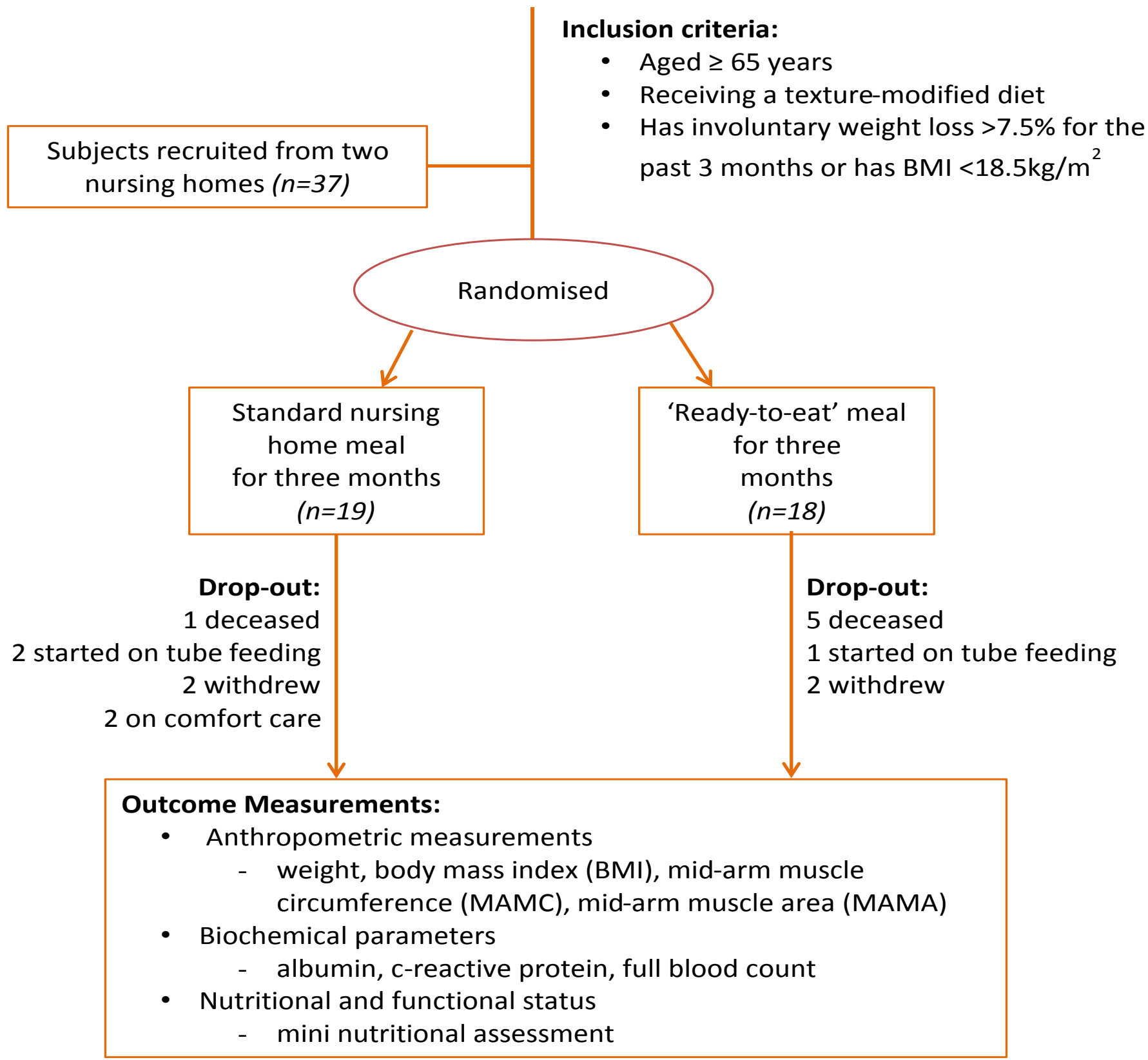
METHODOLOGY

Subjects were recruited from two nursing homes and were randomised into two groups using stratified randomisation method. The control group was served standard nursing home meal while the intervention group was served study meal for three months.

The study meal is a ‘ready-to-eat’ cooked chilled meal which can be consumed after reheating. Each meal consists of a carbohydrate main, with vegetable and protein-based side dishes, designed to meet 25% of the Recommended Daily Allowance for Singapore older adults and to the taste of the local population. They are available in coarsely minced, finely minced and blended consistency.



Data collected include nutritional status, anthropometric and biochemistry measurements. Comparisons were made between the groups at baseline and at the third month. Mann-Whitney U test was used to determine differences between groups. A p-value of <0.05 was considered as statistically significant.



RESULTS

Table 1. Baseline characteristics and results of biochemistry test in control and intervention group

	Control group (n=12)	Intervention group (n=10)
N (%) or Mean ± SD		
Gender		
Male	4 (33)	3 (30)
Female	8 (67)	7 (70)
Age, years	81.0 ± 6.1	82.1 ± 5.9
Weight, kg	38.3 ± 6.8	40.9 ± 6.2
Body Mass Index, kg/m ²	16.1 ± 2.2	17.4 ± 2.7
Albumin, g/L	36.8 ± 4.8	33.0 ± 11.9
Haemoglobin, g/dL	11.7 ± 1.5	9.4 ± 3.7
Mini Nutritional Assessment Score		
Normal nutritional status	0 (0)	0(0)
At risk of malnutrition	3 (25)	4 (40)
Malnourished	9 (75)	6 (60)
Diet consistency		
Coarsely minced diet	2 (16.7)	3 (30)
Finely minced diet	3 (25.0)	3 (30)
Blended diet	7 (58.3)	4 (40)

No significant difference found in all the above variables between control and intervention group at baseline

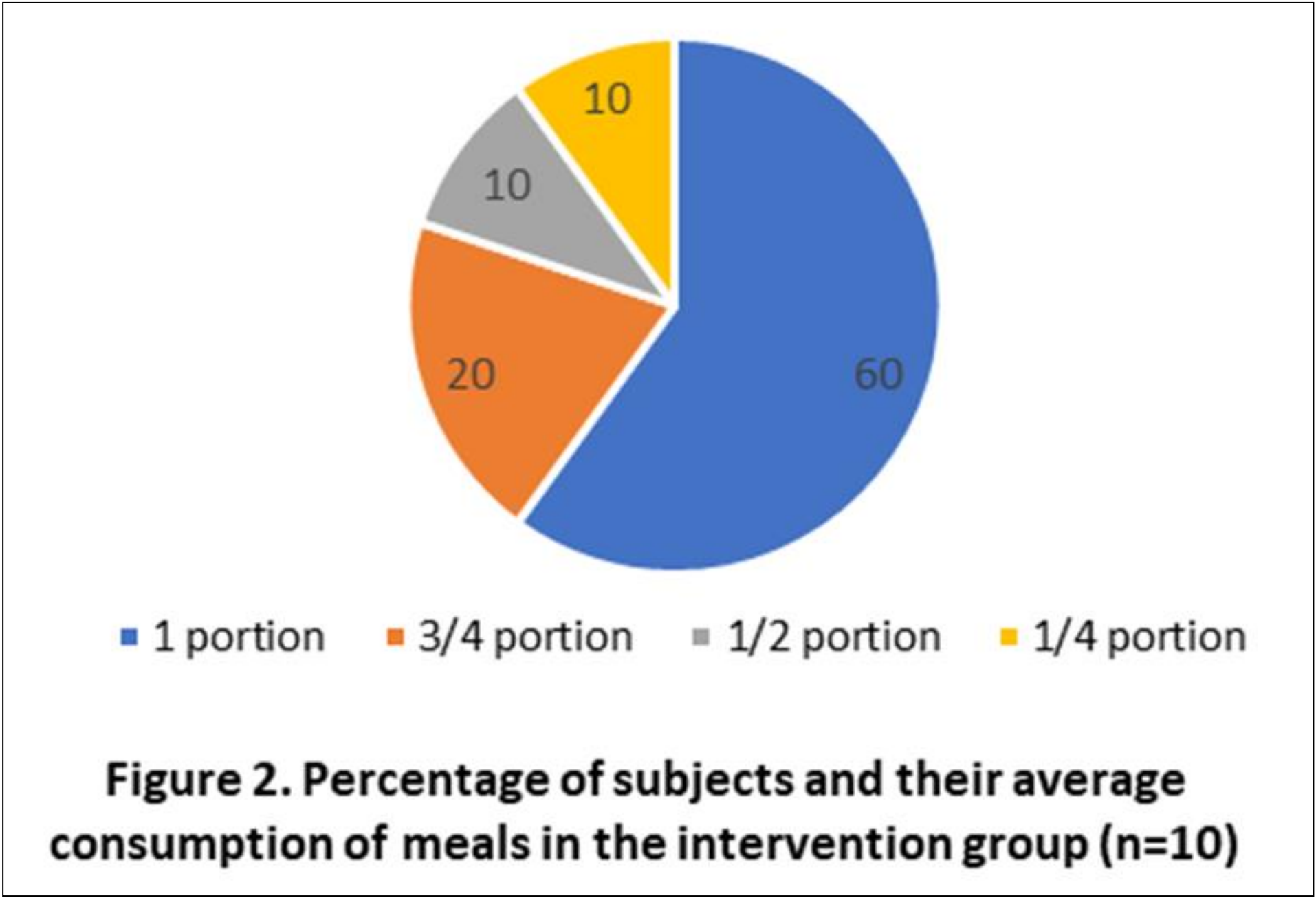
Majority of the subjects on TMM were malnourished. This finding is similar to other reports where undernutrition was found to be prevalent in institutionalised elderly.³

Table 2. Percentage change of the parameters from baseline and at third month

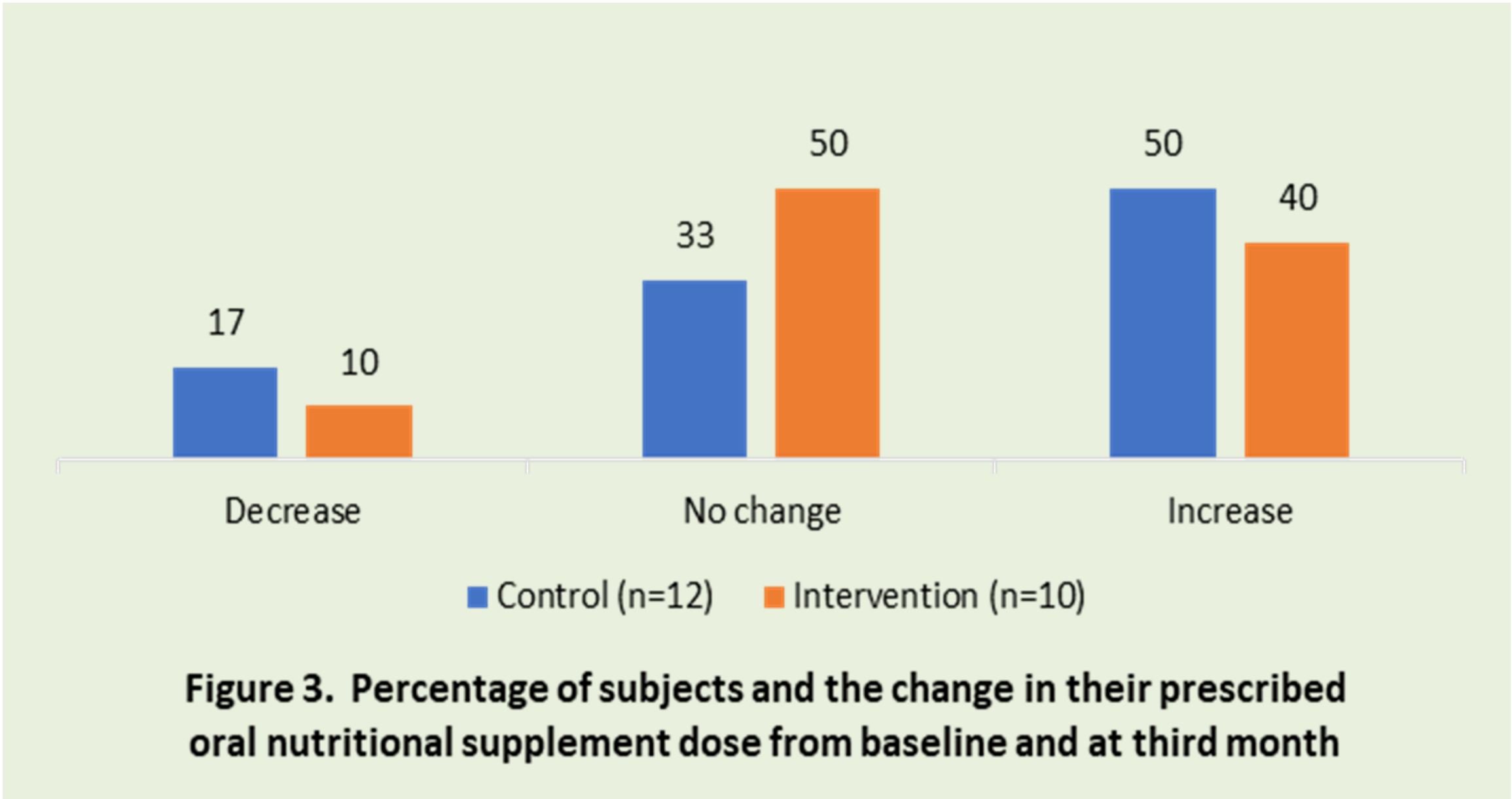
	Control group (n=12)	Intervention group (n=10)	p-value
Weight, kg	0.81 (-1.99 to 4.87)	2.88 (-2.99 to 9.73)	0.539
BMI, kg/m ²	0.67 (-1.87 to 5.01)	2.66 (-2.79 to 9.60)	0.539
MAMC, cm	11.76 (-7.69 to 120.00)	43.33 (-4.17 to 132.14)	1.000
MAMA, mm ²	27.00 (-17.77 to 280.67)	204.46 (3.32 to 483.11)	0.503
MNA Score	0.0 (-6.11 to 6.03)	0.0 (-20.65 to 14.58)	1.000
Albumin, g/L	2.91 (0.59 to 10.39)	6.10 (-1.22 to 14.42)	0.635
Hb, g/dL	0.00 (-1.67 to 8.75)	0.00 (-8.52 to 2.27)	0.368

All data presented in median (interquartile range)

Subjects in the intervention group had greater change in weight, BMI, MAMC and MAMA measurements and serum albumin level compared to the control group. This showed that provision of nutritionally balanced, culturally appropriate TMM can help improve nutritional status in the elderly population. However, the results are not significantly different due to high variability between subjects and small sample size.



More than 50% of the subjects in the intervention group completed their meals suggesting that the ‘ready-to-eat’ meals were acceptable by the elderly population.



In addition, more subjects in the control group were prescribed oral nutritional supplements (ONS) to meet their nutritional requirements while the intervention group only had the TMM. This showed that the ‘ready-to-eat’ meals are adequate to meet the nutritional needs of elderly with dysphagia and may help reduce their reliance on ONS.

CONCLUSION & FUTURE WORKS

A larger sample size is needed to conclude the findings. The future studies can also consider the benefits and economic outcomes of the ‘ready-to-eat’ TMM for residents in nursing home care.

This development of the ‘ready-to-eat’ meals therefore aims to improve the nutritional status of patients with dysphagia thus reducing the risk of malnutrition and its associated health care cost. With the commercialization of this product, we aim to broaden the benefits of our products to a wider population in the community. This is evidence that the development not only aims at care to heal but also innovates to advance healthcare, therefore improving patient experience.

REFERENCES

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3.Verbrugghe M, Dimitri Beecman , Hecke A, et al. Malnutrition and associated factors in nursing home residents: A cross-sectional, multi-centre study. *Clin Nutr* 2013; 32(3):438-43