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The Efficacy of Egg White Powder on Anthropometric Indices in Malnourished Children

Maryam Hamidian Shirazi; MSc[1,2,3], Afsane Ahmadi; PhD[3], Mohammad Reza Dehghani; PhD[4], Mohammad Jafar Dehzad; MSc[3], Maryam Ekramzadeh; PhD[*2] & Mehran Nouri; PhD[1,2]

[1] Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran; [2] Nutrition Research Center, Shiraz University of Medical Sciences, Shiraz, Iran; [3] Department of Clinical Nutrition, School of Nutrition and Food Sciences, Shiraz University, Shiraz University of Medical Sciences, Shiraz, Iran; [4] Clinical Education Research Center, Shiraz University of Medical Sciences, Shiraz, IR Iran.

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Corresponding author:
mekramzade@gmail.com
Assistant Professor, Nutrition Research Center, Department of Clinical Nutrition, School of Nutrition and Food Sciences, Shiraz University of Medical Sciences, Razi Blvd, Shiraz, Iran.

Postal code: 7153675500
Tel: +98 71 37251004

ABSTRACT

Background: White egg powder provides essential amino acids compounds. This study aims to investigate the theory that a regular consumption of white egg powder would improve weight gain and appetite in children with malnutrition. **Methods**: The present experimental study was conducted among children aged 3-6 years with mild to severe malnutrition referred to Ghadir Mother and Child Hospital affiliated with Shiraz University of Medical Sciences from April to October 2017. The malnourished children received egg white protein (1 g/kg of their current body weight) for 3 weeks. Weight loss as a primary outcome and weight-for-height Z-score (WHZ), height-for-age Z-score (HAZ), weight-for-age Z-score (WAZ), and BMI-for-age Z-score (BAZ) were measured as secondary outcomes, assessed at baseline and after six weeks of study. **Results:** Of the 23 children included, 20 finished the study. Weight increased in all children although it was not significant (P = 0.101). A lower appetite was seen at the end of the intervention, but it was not significant (P = 0.575). Malnutrition based on WHZ and BAZ decreased compared to the baseline measurement, while the changes were not significant. Regarding other markers, no statistically significant changes were found compared to the baseline measurement. **Conclusion**: The addition of white egg powder to complementary nutrition could not improve weight gain and appetite in malnourished children. Further research with a larger study population and longer intervention time is needed to demonstrate the clear effect of egg white on improving malnutrition in children.

Keywords: *White egg powder, Malnutrition, Children, Weight gain*

Introduction

Malnutrition is a condition in which the body does not receive enough nutrients, leading to acute or chronic deficiencies in protein, other nutrients, and energy in children that can cause half of the deaths among them (Kemenkes, 2011). Malnutrition can lead to cognitive impairment and growth retardation and is also related to a higher vulnerability to different types of morbidity and

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(Boye, 2012). According to the American Academy of Sciences, supplemental feeding with eggs is considered without the risk of increasing the incidence of allergies (Greer *et al.*, 2008).

In this study, the effect of egg white powder on weight gain and other anthropometric indices in malnourished children was tested for the first time. This experimental study has some limitations. The possibility of no intervention for malnourished children is not scientifically and morally acceptable. This study was designed and conducted without a control group. It would be preferable to look for other inflammatory agents. Feeding was indirectly checked by telephone, so there was uncertainty about the amount of white egg powder consumed by the studied children. With significant protein and micronutrients found in egg whites, it was expected that the white egg powder would improve growth and appetite in children with malnutrition. Studies with longer intervention time appear to be more effective. Another limitation of the study is the low sample size and short duration. Six weeks is too short to observe the changes in primary and secondary outcomes, especially in terms of anthropometric indicators. It is suggested that egg powder with desirable flavors with better reception by children be evaluated in future studies. It was also better to use appetite tests to accurately assess children's appetite.

Conclusions

This experimental study showed that 1 g/kg white egg powder per day in 3-6-year-old children with malnutrition for 6 weeks can affect the WHZ and BAZ parameters to some extent, but these changes were not significant. Egg allergy was also observed in one participant. Further studies with larger sample sizes and lengths of studies are needed to evaluate the effectiveness of egg whites in the development of malnourished children. Since malnutrition is a multifaceted condition, it will definitely necessitate complicated involvement to improve it.

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Conflict of interest

None

Authors' contributions

Research idea and study design: Ekramzadeh M, Ahmadi A, Dehzad MJ, Dehghani MR; data acquisition: Dehzad MJ, Dehghani MR; data analysis/interpretation: Hamidianshirazi M, Ekramzadeh M, Nouri M; statistical analysis: Hamidianshirazi M, Ahmadi A, Nouri M; supervision or mentorship: Ekramzadeh M, AH. Each author contributed to the important intellectual content during manuscript drafting or revision.

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