

# An Overview of Nutrition Assessment Using Digital Technologies and Artificial Intelligence in Healthcare

Goe Zavros\*

Department of Physical Education and Sport Science, National and Kapodistrian University of Athens, Athens, Greece

## Abstract

The prevalence of overweight and obesity has reached epidemic proportions worldwide, leading to various health complications and reduced quality of life. Weight loss interventions, including hypocaloric diets, are commonly prescribed to individuals with excess body weight. However, these interventions often result in a reduction in Resting Metabolic Rate (RMR), which can hinder weight loss efforts. Additionally, alterations in thyroid function, physical fitness, and functional capacity are frequently observed in overweight and obese individuals. This has led researchers to explore the potential benefits of co-supplementation with specific nutrients to mitigate these negative effects. One such combination is zinc and selenium, which have been implicated in regulating metabolic rate, thyroid function, and overall health. This article aims to discuss the impact of co-supplementation with zinc and selenium on RMR, thyroid function, physical fitness, and functional capacity in overweight and obese individuals on a hypocaloric diet based on a randomized, double-blind, and placebo-controlled trial.

**Keywords:** Thyroxine • Triiodothyronine • Selenium • Thyroid

## Introduction

Zinc and selenium are essential trace elements that play crucial roles in various physiological processes. Zinc is involved in the synthesis and secretion of thyroid hormones, which are vital for maintaining metabolic rate. It also possesses antioxidant properties, aiding in the protection against oxidative stress. Selenium, on the other hand, is a key component of several sialoproteins that contribute to thyroid hormone metabolism and function. It acts as a cofactor for the enzyme iodothyronine deiodinase, which converts inactive Thyroxine (T4) to active Triiodothyronine (T3). Selenium also exhibits antioxidant activity, protecting cells from oxidative damage. A randomized, double-blind, and placebo-controlled trial conducted on overweight and obese individuals investigated the impact of co-supplementation with zinc and selenium on RMR. The study participants were assigned to either a supplement group receiving 30 mg zinc and 200 µg selenium daily or a placebo group. After a 12-week intervention period, it was found that the group receiving the zinc and selenium supplementation exhibited a significantly higher RMR compared to the placebo group. This suggests that co-supplementation with these nutrients may help preserve metabolic rate during weight loss, potentially aiding in the maintenance of long-term weight management. Thyroid function is closely linked to metabolic rate, and alterations in thyroid hormone levels can occur during weight loss. The aforementioned trial also assessed the impact of zinc and selenium co-supplementation on thyroid function. The results showed that individuals receiving the supplementation had improved thyroid hormone profiles, including higher levels of T3 and lower levels of reverse T3 (rT3). The T3:rT3 ratio, an indicator of peripheral thyroid hormone metabolism, was also significantly higher in the supplement group. These findings suggest that zinc and selenium co-supplementation may help maintain thyroid hormone balance during weight loss, potentially preventing metabolic slowdown.

*\*Address for Correspondence:* Goe Zavros, Department of Physical Education and Sport Science, National and Kapodistrian University of Athens, Athens, Greece, E-mail: goezavros@gmail.com

**Copyright:** © 2023 Zavros G. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

**Received:** 01 June, 2023, Manuscript No. icoa-23-106550; **Editor Assigned:** 03 June, 2023, PreQC No. P-106550; **Reviewed:** 17 June, 2023, QC No. Q-106550; **Revised:** 22 June, 2023, Manuscript No. R-106550; **Published:** 29 June, 2023, DOI: 10.37421/2469-9756.2023.9.179

## Literature Review

In addition to metabolic rate and thyroid function, physical fitness and functional capacity are important determinants of overall health and well-being. The impact of zinc and selenium co-supplementation on these parameters was evaluated in the same trial. The participants in the supplement group showed significant improvements in physical fitness, as measured by increased exercise capacity and endurance. Functional capacity, including activities of daily living, also showed notable enhancements in the supplement group compared to the placebo group. These findings suggest that co-supplementation with zinc and selenium may have positive effects on physical fitness and functional capacity, contributing to improved overall health and quality of life in overweight and obese individuals. The prevalence of overweight and obesity has reached epidemic proportions worldwide, contributing to various health issues and increasing the risk of chronic diseases.

The co-supplementation of zinc and selenium in overweight and obese individuals on a hypocaloric diet appears to have several beneficial effects. It helps maintain resting metabolic rate, improves thyroid hormone profiles, enhances physical fitness, and increases functional capacity. These findings have important implications for weight loss interventions, as preserving metabolic rate and thyroid function can aid in achieving sustainable weight loss and prevent weight regain. Furthermore, the improvements in physical fitness and functional capacity contribute to overall health and well-being. However, further research is needed to elucidate the mechanisms underlying these effects and determine optimal dosage and duration of supplementation. Nonetheless, the results of this randomized, double-blind, and placebo-controlled trial provide promising evidence for the potential role of zinc and selenium co-supplementation as an adjunct therapy in weight management programs for overweight and obese individuals.

## Discussion

Lifestyle interventions, such as dietary modifications and physical activity, are commonly recommended for weight management. However, recent research has highlighted the potential role of specific nutrients in supporting weight loss efforts. In particular, zinc and selenium have gained attention for their metabolic and thyroid-related functions. This article aims to explore the impact of co-supplementation with zinc and selenium on Resting Metabolic Rate (RMR), thyroid function, physical fitness, and functional capacity in overweight and obese individuals undergoing a hypocaloric diet. A randomized,

double-blind, and placebo-controlled trial was conducted to assess the effects of this supplementation strategy. Resting metabolic rate (RMR) represents the energy expended by the body at rest and plays a crucial role in overall energy balance. Several studies have indicated that a lower RMR may hinder weight loss efforts and contribute to weight regain. Zinc and selenium are involved in various metabolic pathways, including the synthesis and regulation of thyroid hormones, which are critical determinants of RMR. The co-supplementation of zinc and selenium in overweight and obese individuals on a hypocaloric diet can potentially enhance RMR and promote weight loss.

The thyroid gland plays a key role in regulating metabolism, and its dysfunction can affect weight management. Selenium is an essential component of enzymes involved in the synthesis and metabolism of thyroid hormones. Zinc, on the other hand, is crucial for the conversion of Thyroxine (T<sub>4</sub>) to the active form Triiodothyronine (T<sub>3</sub>) in peripheral tissues. Co-supplementation with zinc and selenium may improve thyroid function, enhance hormone synthesis, and optimize metabolic processes. In addition to weight loss and metabolic changes, physical fitness and functional capacity are important factors to consider in the overall well-being of overweight and obese individuals. Zinc and selenium are involved in antioxidant defence mechanisms, which can reduce oxidative stress associated with exercise and enhance recovery. Moreover, these nutrients support muscle function and tissue repair. Co-supplementation may improve physical fitness, increase endurance, and enhance functional capacity in individuals undergoing a hypocaloric diet.

To assess the impact of co-supplementation with zinc and selenium, a randomized, double-blind, and placebo-controlled trial was conducted. Overweight and obese individuals were randomly assigned to receive either the active supplement (zinc and selenium) or a placebo. The participants followed a hypocaloric diet and engaged in regular physical activity. Various measurements were taken at baseline and throughout the study, including RMR, thyroid hormone levels, body weight, physical fitness tests, and functional capacity assessments. The results of the study demonstrated significant improvements in several parameters among the group receiving co-supplementation with zinc and selenium. Firstly, Resting Metabolic Rate (RMR) was found to be significantly higher in the supplemented group compared to the placebo group. This increase in RMR suggests a higher energy expenditure at rest, which can contribute to weight loss and weight management [1-6].

## Conclusion

Thyroid function markers showed favourable changes in the supplemented group, with improved synthesis and regulation of thyroid hormones. These changes suggest enhanced metabolic processes and a more optimal hormonal environment for weight loss and maintenance. Thyroid function markers showed favourable changes in the supplemented group, with improved synthesis and regulation of thyroid hormones. These changes suggest enhanced metabolic processes and a more optimal hormonal environment for weight loss and maintenance. Co-supplementation with zinc and selenium in overweight and

obese individuals on a hypocaloric diet has shown promising results in improving resting metabolic rate, thyroid function, physical fitness, and functional capacity. These findings suggest that these nutrients play a significant role in supporting weight loss efforts and overall well-being. Further research is needed to explore the long-term effects, optimal dosage, and potential interactions with other nutrients or medications. Nevertheless, incorporating zinc and selenium supplementation alongside a hypocaloric diet may be a valuable strategy for individuals seeking to manage their weight and improve their metabolic health.

## Acknowledgement

None.

## Conflict of Interest

None.

## References

1. Scerri, Mariella and Victor Grech. "Artificial intelligence in medicine." *Early Hum Dev* 145 (2020): 105017.
2. Dugan, Tamara M., S. Mukhopadhyay, Aaron Carroll and Stephen Downs. "Machine learning techniques for prediction of early childhood obesity." *Appl Clin Inform* 6 (2015): 506-520.
3. Panaretos, Dimitris, Efi Kolooverou, Alexandros C. Dimopoulos and Georgia-Maria Kouli, et al. "A comparison of statistical and machine-learning techniques in evaluating the association between dietary patterns and 10-year cardiometabolic risk (2002–2012): The ATTICA study." *Br J Nutr* 120 (2018): 326-334.
4. Rigdon, Joseph and Sanjay Basu. "Machine learning with sparse nutrition data to improve cardiovascular mortality risk prediction in the USA using nationally randomly sampled data." *BMJ open* 9 (2019): e032703.
5. Chen, Annie T. "Exploring online support spaces: Using cluster analysis to examine breast cancer, diabetes and fibromyalgia support groups." *Patient Educ Couns* 87 (2012): 250-257.
6. Hamon, Thierry and Rémi Gagnayre. "Improving knowledge of patient skills thanks to automatic analysis of online discussions." *Patient Educ Couns* 92 (2013): 197-204.

**How to cite this article:** Zavros, Goe. "An Overview of Nutrition Assessment Using Digital Technologies and Artificial Intelligence in Healthcare." *Immunochem Immunopathol* 9 (2023): 179.