



The Link Between Nutrition and Chronic Low Back Pain

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PUBLIC PHD DEFENCE FOR THE DEGREE OF
DOCTOR IN REHABILITATION SCIENCES AND PHYSIOTHERAPY

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ABSTRACT OF THE RESEARCH

Chronic low back pain (CLBP) is a prevalent and burdensome condition that affects individuals worldwide. Despite its significance, the role of nutrition in CLBP remains poorly understood. This thesis aims to contribute to the understanding of the link between nutrition and non-specific chronic low back pain (nCLBP) by exploring the interaction between nutrition and chronic pain.

The dissertation is divided into four main parts. Part I comprises two narrative reviews, providing an overview of existing knowledge on the interplay between nutrition and chronic non-cancer, non-neuropathic pain. It emphasizes the bi-directional relationship between nutrition and chronic pain, highlighting oxidative stress, inflammation, and other potential mechanisms such as the gut-brain axis and metabolic disturbances. However, it also reveals a lack of high-quality evidence from randomized controlled trials and systematic reviews in this field. Part II includes two systematic reviews, one focusing on preclinical animal studies and the other on human studies, aiming to identify pronociceptive and analgesic effects of diets on various types of chronic pain. The results show that specific diets can modulate pain sensitivity in both preclinical and human studies. However, limited research specifically targets the nCLBP population, indicating a need for further investigation. Part III involves a case-control study comparing patients with nCLBP to pain-free healthy controls. The study reveals that patients with nCLBP exhibit lower diet quality, increased consumption of pro-inflammatory foods, decreased intake of anti-inflammatory nutrients, and reduced water intake. Furthermore, pain sensitivity correlates positively with pro-inflammatory diets and negatively with anti-inflammatory nutrients. Lastly, Part IV is a randomized cross-over trial investigating the association between nutritional factors and nCLBP. The study focuses on differences in post-prandial glucose metabolism between nCLBP patients and healthy controls. It finds that normoglycemic nCLBP patients may have a higher risk of impaired glucose tolerance and benefit more from low glycemic index carbohydrates compared to healthy controls. However, no direct association between pain sensitivity and glucose metabolism is observed.

In conclusion, this comprehensive thesis sheds light on the link between nutrition and nCLBP, revealing potential mechanisms and effects of dietary interventions on chronic pain. The findings underscore the importance of nutrition in managing nCLBP and suggest a promising avenue for further research and more effective treatment approaches in addressing this debilitating condition.

CURRICULUM VITAE

Ömer Elma is a highly accomplished physiotherapist and pain science researcher with a special interest in precision nutrition and precision pain. He holds a Bachelor's degree in Physiotherapy from Turkey and a Master's degree from the University of Nottingham, England. Currently pursuing his Ph.D. at the Vrije Universiteit Brussel, Ömer has published 14 papers and has three more under review, showcasing his expertise in the field. He actively participates in international conferences, presenting his research findings and delivering workshops on pain science. Ömer's multidisciplinary approach and dedication to advancing knowledge in pain management highlight his significant contributions to the field.

