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The effect of Galacto-Oligosaccharides (GOS) on self-perceived stress in apparently healthy but stressed Dutch women: A randomized controlled home-based trial

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Background: In modern life, many people experience stress [1] with a global prevalence up to 86% [2] and negative consequences on wellbeing.[3] Women compared to men report more and higher levels of stress. [4] Recent research suggests that the intake of prebiotic Galactose-Oligosaccharides (GOS), and possibly also 2'-Fucosyllactose (2'-FL), both stimulating the growth of intestinal bifidobacterial [5], may potentially result in improvement of mental wellbeing via the Gut-Brain-Axis (GBA).

Objective: The aim of the current explorative study was to assess the potential stress reducing effect of combined GOS and 2'-FL in healthy women with self-perceived stress.

Materials & Methods: In this randomized double-blinded study, 122 healthy Dutch women aged 25-45 years with self-reported moderate to severe stress (DASS-42 stress sub-score ≥ 19 at screening) consumed either 5.0 g GOS powder, with 3.65 g of active GOS, and 0.5 g 2'-FL (Relax+) or 5.5 g Maltodextrin (Placebo) for 28 days. Bi-weekly validated questionnaires were conducted to study the effect on self-perceived stress, anxiety, depression (DASS-42 sub-scores), sleep quality (ASQ), and mood. Furthermore, at base- and end-line of the intervention, saliva samples were taken to measure early morning salivary cortisol. This study took place during the COVID-19 pandemic. ClinicalTrials.gov Identifier: NCT05372601.

Results: Feelings of self-perceived stress were significantly reduced over time in both intervention and placebo group, but without differences between groups. Similar effects were shown for anxiety, depression, sleep quality, and mood. Remarkably, salivary cortisol levels at baseline and endpoint were within normal range, despite self-perceived stress (DASS-42) at baseline. This indicates low activity of the HPA axis in the study participants.

Conclusion: The outcomes of this explorative study indicate no additional stress-reducing effect of GOS+2'-FL on top of the observed placebo-effect in women with self-perceived stress but without a cortisol response. The relationship between mental wellbeing and cortisol responses needs further exploration considering the non-correspondence of self-perceived stress (DASS-42 score) with analyzed salivary cortisol.

Discussion: There are several psychosocial stress types of which (general life) stress is associated with an increased Cortisol Awakening Response (CAR), while CAR is flattened during fatigue, burnout, and exhaustion. [6-8] Considering pandemic's effect on mental health and characteristics of the study population (majority is part of the Millennial generation, >40% of the participants had a past treatment of depressive complaints, and about 80% said to have difficulty with relaxation), this may be linked to the blunted cortisol response. Alternatively, it might be that cortisol responses and self-perceived stress are not always positively correlated given that the underlying physiology is complex. [9]

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Biography

Reina S Tjoelker is a Project Manager Nutrition and Clinical trials at FrieslandCampina. She has a MSc degree in Biomedical Sciences from the University of Groningen. She is passionate about the role nutrition plays in health, growth and wellbeing and is currently working on multiple nutrition intervention studies in different areas within FrieslandCampina.

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