

## 1. Streszczenie w języku angielskim

Infertility is a global problem, affecting millions of couples around the world. It is a disease of couples, not individuals, which makes diagnosis and treatment difficult. Male infertility can have many causes, from mechanical issues to abnormal spermatogenesis and spermiogenesis. The quality of semen is influenced by many factors, including those dependent on men themselves. These include, among others: diet, physical activity, sleep quality, stress and much more. Because these factors coexist with insulin resistance, a disease closely related to lifestyle, the study focused on examining the relationship between lifestyle and semen quality in the context of this disease. In order to examine the connections between lifestyle, insulin resistance and semen quality, a review of the literature published in 1989-2020 was carried out, and then a research experiment was conducted, the aim of which was to confirm or disprove the connection between lifestyle factors, such as physical activity, diet, and perceived stress, sleep quality and sleep duration as well as sexual abstinence and semen quality in the context of insulin resistance. Another goal was to select lifestyle factors that would predict the level of male fertility, especially in the context of insulin resistance.

The study was conducted in a group of 73 men, divided into groups according to the presence or absence of insulin resistance. Their physical activity, diet, perceived stress, sleep quality, libido level and duration of sexual abstinence were assessed based on a number of parameters, including indicators proposed by the authors. Additionally, appropriate anthropometric measurements were performed. Glucose metabolism and semen quality studies were performed. Based on this data, statistical tests were performed to establish or disprove the relationship between lifestyle and semen quality. The results of this study highlighted the associations between many parameters, i.e. micronutrient and vitamin intake, diet quality, body composition, insulin resistance, duration of sexual abstinence and semen quality measured by sperm motility, due to the high importance of this parameter in the context of male fertility. Importantly, the presence or absence of insulin resistance has been associated with male fertility. A multivariate model was developed, including

parameters such as Matsuda Index, vitamin intake, and duration of sexual abstinence, to predict sperm motility outcomes.

This study highlights the negative impact of the incorrect lifestyle of men on their fertility. Vitamin and mineral intake, particularly from antioxidant-rich diets such as the Mediterranean diet, have emerged as key modifiable factors influencing fertility. Routine diagnosis of insulin resistance in fertility-related interventions may be a good direction in the study of male infertility. This study also highlights the importance of considering the duration of sexual abstinence when collecting semen in order to obtain accurate diagnostic results. Future research should focus on validating the proposed multivariate model and examining the impact of lifestyle modifications, especially vitamin supplementation, on male fertility, particularly in the context of insulin resistance.

