Associations of ultra-processed food and its underlying consumption patterns with incident Type 2 Diabetes: the Lifelines cohort study

Mingjie Duan*[1]; Petra C. Vinke*[2]; Gerjan J. Navis[1]; Eva Corpeleijn[2]; Louise H. Dekker[1,3]. Corresponding author: Mingjie Duan, m.duan@umcg.nl

[1] University of Groningen, University Medical Center Groningen, Department of Internal Medicine, Division Nephrology (AA52), P.O. Box 30 001, 9700 RB Groningen, The Netherlands; [2] University of Groningen, University Medical Center Groningen, Department of Epidemiology (FA40), P.O. Box 30 001, 9700 RB Groningen, The Netherlands; [3] Aletta Jacobs School of Public Health, University of Groningen, Groningen, The Netherlands; *Contributed equally

ABSTRACT

BACKGROUND: Although consumption of ultra-processed food (UPF) has previously been associated with adverse health outcomes, it is unclear how the consumption of UPF and its underlying habitual consumption patterns are associated with incident type 2 diabetes.

METHODS: In 70 421 participants (35-70 years, 58.6% women) from the Lifelines cohort study, dietary intake was assessed with a food frequency questionnaire. Principal component analysis (PCA) was performed to derive UPF consumption patterns. UPF was related to incident diabetes with adjustments for confounders, including overall diet quality.

RESULTS: During a median follow-up of 41 months, the intake of UPF was associated with higher risk of type 2 diabetes (1128 cases, OR for a 10% increment in UPF intake 1.33 [95% CI 1.26, 1.41]), and remained significant after adjustment for confounders (OR 1.25 [95% CI 1.16, 1.34]). PCA revealed four habitual UPF consumption patterns. A pattern high in cold savory snacks (OR 1.16 [95% CI 1.09, 1.22]) and a pattern high in warm savory snacks (OR 1.15 [95% CI 1.08, 1.21]) were associated with an increased diabetes risk; a pattern high in traditional Dutch cuisine was not associated with diabetes risk (OR 1.05 [95% CI 0.97, 1.14]); while a pattern high in sweet snacks and pastries was inversely associated with diabetes risk (OR 0.82 [95% CI 0.76, 0.89]). There was a clear inverse association between diabetes risk at baseline and the sweet snacks and pastries pattern (β = -0.104 [95% CI -0.113, -0.094]).

CONCLUSIONS: A higher consumption of UPF was associated with higher risk of type 2 diabetes. For consumption patterns, this association was most pronounced for the patterns that were high in savory snacks. Our findings emphasize that in addition to promoting the consumption of healthy food products, discouraging the consumption of UPF, specifically savory snacks, should be considered as part of future diabetes prevention strategies.