

Abstract

Nutrition-Related Factors and the Progression of Metabolic Syndrome Characteristics over Time in Older Adults: Analysis of the TUDA Cohort [†]

Oonagh C. Lyons ^{1,2,*}, Maeve A. Kerr ¹, Mary A. T. Flynn ^{1,2}, Leane Hoey ¹, Catherine F. Hughes ¹, Mary Ward ¹ and Helene McNulty ¹

¹ Nutrition Innovation Centre for Food and Health (NICHE), School of Biomedical Sciences, Ulster University, Coleraine BT52 1SA, Northern Ireland, UK; ma.kerr@ulster.ac.uk (M.A.K.); mflynn@fsai.ie (M.A.T.F.); l.hoey@ulster.ac.uk (L.H.); c.hughes@ulster.ac.uk (C.F.H.); mw.ward@ulster.ac.uk (M.W.); h.mculty@ulster.ac.uk (H.M.)

² Food Safety Authority of Ireland, D01 P2V6 Dublin, Ireland

* Correspondence: olyons@fsai.ie

[†] Presented at the 14th European Nutrition Conference FENS 2023, Belgrade, Serbia, 14–17 November 2023.

Abstract: Metabolic syndrome (MetS) is associated with an increased risk of cardiovascular disease and type 2 diabetes mellitus by an estimated two- and five-fold, respectively. Nutrition intervention could help to prevent the progression of MetS and associated pathologies with age, but the precise dietary components and related factors are not well understood. Therefore, the aim of this study was to evaluate the role of nutrition-related factors in MetS as well as the progression of MetS and its components over a 7-year follow-up period in older adults. This investigation involved the secondary analysis of data from the North–South of Ireland Trinity–Ulster–Department of Agriculture (TUDA) study of community-dwelling older adults (≥ 60 y), which were sampled at baseline (2008–2012; $n = 5186$) and follow-up (2015–2018; $n = 953$). Participants were deemed to have MetS if they met at least three of the following criteria: waist circumference (≥ 102 cm for males, ≥ 88 cm for females); HDL cholesterol (< 1.0 mmol/L for males, < 1.3 mmol/L for females); triglycerides (≥ 1.7 mmol/L); blood pressure (systolic ≥ 130 and/or diastolic ≥ 85 mmHg); and HbA1c (≥ 39 mmol/mol). The prevalence of MetS increased with advancing age (67% at baseline vs. 74% at follow-up). The factors at baseline that were predictive of a higher MetS risk at follow-up included waist circumference (OR 1.04, 95% CI 1.00–1.08; $p = 0.038$) and triglycerides (OR 1.77, 95% CI 1.21–2.59; $p = 0.003$). In a detailed dietary analysis conducted at the follow-up time point, higher protein intake (g/kg body weight) was associated with a lower risk of MetS (OR 0.06, 95% CI 0.02–0.20; $p < 0.001$), abdominal obesity (OR 0.10, 95% CI 0.02–0.51; $p = 0.006$), and hypertension (OR 0.022, 95% CI 0.00–0.80; $p = 0.037$), and a higher MUFA intake (g/day) was associated with a lower risk of MetS (OR 0.88, 95% CI 0.78–1.00; $p = 0.030$). No other dietary factors were significantly associated with MetS. In terms of protein quality, participants with MetS compared to those without consumed fewer high-quality protein foods ($p = 0.009$) and consumed more low-quality protein foods ($p < 0.001$). Dietary intervention along with other strategies focusing on potentially modifiable risk factors may delay the progression of MetS in older adults. Efforts to enhance the quantity and quality of protein intake may be warranted to reduce MetS in certain at-risk groups.



Citation: Lyons, O.C.; Kerr, M.A.; Flynn, M.A.T.; Hoey, L.; Hughes, C.F.; Ward, M.; McNulty, H. Nutrition-Related Factors and the Progression of Metabolic Syndrome Characteristics over Time in Older Adults: Analysis of the TUDA Cohort. *Proceedings* **2023**, *91*, 157. <https://doi.org/10.3390/proceedings2023091157>

Academic Editors: Sladjana Sobajic and Philip Calder

Published: 1 February 2024



Copyright: © 2024 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Keywords: metabolic syndrome; older adults; nutrition-related factors; protein quality

Author Contributions: H.M., M.A.K. and M.A.T.F. planned and designed the research and provided supervision to O.C.L.; O.C.L. was responsible for analyzing the data. L.H., C.F.H. and M.W. provided access to the TUDA data and advised on data analysis. O.C.L. wrote the initial draft, and H.M., M.A.K., M.A.T.F., L.H. and C.F.H. provided important inputs for redrafting. H.M. had primary responsibility for the final content. All authors have read and agreed to the published version of the manuscript.

Funding: The TUDA study was supported by governmental funding from the Irish Department of Agriculture, Food and the Marine and Health Research Board (under the Food Institutional Research Measure, FIRM) and from the Northern Ireland Department for Employment and Learning (under its Strengthening the All-Island Research Base initiative). The funders of this research had no role in the design, methods, subject recruitment, data collections, analysis and preparation of this paper.

Institutional Review Board Statement: Ethical approval was granted by the Office for Research Ethics Committees Northern Ireland (ORECNI; reference 08/NIRO3/113), with corresponding approvals from the Northern and Western Health and Social Care Trusts in Northern Ireland, and the Research Ethics Committee of St James Hospital and The Adelaide and Meath Hospital in Dublin.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Some or all datasets generated during and/or analyzed during the current study are not publicly available but are available from the corresponding author on reasonable request.

Conflicts of Interest: The authors declare no conflict of interest.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.