Abstract

Dietary carbohydrate patterns and adherence to the Eatwell Guide among UK adults: Analysis from the National Diet and Nutrition Survey years 9 to11 (2016-2019)

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The Eatwell Guide (EWG) is "a policy tool to define government recommendations on eating healthily and achieving a balanced diet", where a third of the diet should come from starchy foods and the remaining portion from fruits and vegetables, protein-rich foods, dairy and other foods [1]. Both quality and quantity of carbohydrates are critical in a healthy diet, with studies highlighting a stronger link between carbohydrate type and disease risk than total intake [2,3]. To promote improved carbohydrate consumption, it is crucial to understand current carbohydrate-rich food patterns and the socio-demographic factors that influence these dietary patterns.

This research aimed to identify distinctive dietary carbohydrate patterns in a representative sample of UK adults, and assess their adherence to EWG recommendations, and their associations with sociodemographic factors.

Data from a 4-day food diary of 2,757 adults (19-85 years old) in the National Diet and Nutrition Survey wave 9-11 [4] was analysed. Statistical clustering was used to classify individuals according to consumption of starchy-based meals (i.e., potatoes, bread, rice, pasta, and other starchy carbohydrates). The obtained dietary carbohydrate patterns were assessed for adherence to nine EWG food and nutrient recommendations (fruits and vegetables, oily fish, other fish, red and processed meat, fibre, salt, free sugars, saturated fats, and total fat) [5,6] by age and sex. Finally, multivariable logistic regression was used to examine the associations between sociodemographic factors and dietary carbohydrate patterns.

Four dietary carbohydrate patterns were identified: "White Bread and Fried Potatoes" (24%), "Whole Grains" (9%), "Pasta, Rice, and Other Cereals" (19%), and "Varied Carbohydrate Sources" (48%). Starchy carbohydrate intakes ranged from 189g in the "Varied Carbohydrate Sources" pattern to 251g in the "Pasta, Rice, and Other Cereals" pattern. The "Varied Carbohydrate Sources" had the highest proportion (55%) of individuals adhering to 3-4 guidelines; the "White Bread and Fried Potatoes" had the largest share (37%) of individuals with very low adherence. Overall, the most commonly unmet recommendations included dietary fibre (8%), oily fish (20%), and fruits and vegetables (27%), with individuals in the "White Bread and Fried Potatoes" pattern reporting the lowest mean intake for fibre (17.9g), oily fish (5.9g) and fruits and vegetables (243.1g), and highest mean intake for red and processed meat (71.0g), salt (5.6g), free sugars (54.5g), saturated fat (27.2g), and total fat (74.4g). Socio-demographic factors—including sex, age, ethnicity, income, and household size showed significant associations ($p < 0.01$) with dietary carbohydrate patterns and EWG adherence. The "White Bread and Fried Potatoes" pattern was more prevalent in young adult males from lower socioeconomic backgrounds.

Starchy carbohydrate consumption patterns are associated with adherence to EWG recommendations and are influenced by sociodemographic factors. Targeted dietary strategies focusing on the different carbohydrate consumption groups can contribute to meeting food and nutrient recommendations.

References

1. Public Health England (2016) *The Eatwell Guide* [Available at: https://www.gov.uk/government/publications/the-eatwell-guide]
2. Ludwig DS, Hu FB, Tappy L, & Brand-Miller J. (2018) *BMJ*, *361*
3. Seidelmann SB, Claggett B, Cheng S et al (2018)*The Lancet Public Health*, *3*(9), e419–e428
4. University of Cambridge, MRC Epidemiology Unit, NatCen Social Research (2021) *National Diet and Nutrition Survey Years 9-11, 2016–2019* [Available at: 19th Edition. UK Data Service. SN: 6533, DOI: 10.5255/UKDA-SN-6533-19]
5. Scheelbeek P, Green R, Papier K et al (2020). *BMJ open*, *10*(8), e037554
6. Public Health England (2016) *Government Dietary Recommendations* [Available at: https://assets.publishing.service.gov.uk/media/5a749fece5274a44083b82d8/government_dietary_recommendations.pdf]

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