Exposure to platinum group elements in young university students from Leicester, England

Peña-Fernández A. *[1,2], Higueras M.[3], Lobo-Bedmar MC[4], Segura E.[3], Peña MA.[5].

[1] Faculty of Medicine and Health Sciences, University of Alcalá, Ctra. Madrid-Barcelona, Km. 33.600, 28871 Alcalá de Henares, Spain.
[2] Leicester School of Allied Health Sciences, De Montfort University, Leicester, LE1 9BH, UK.
[3] Scientific Computation & Technological Innovation Center (SCoTIC), Universidad de La Rioja, Logroño, Spain.
[4] Departamento de Investigación Agroambiental. IMIDRA. Finca el Encín, Crta. Madrid-Barcelona Km, 38.2, 28800 Alcalá de Henares,Spain.
[5] Faculty of Pharmacy, Universidad de Alcalá, Crta. Madrid-Barcelona Km, 33.6, 28871 Alcalá de Henares, Spain.
Email: antonio.penafer@uah.es

SUMMARY

human hair has been described as a reliable tool to monitor environmental exposure to platinum group elements (PGEs; platinum (Pt), palladium (Pd) and rhodium (Rh)).

Aims: To assess dietary exposure to these metals in young adults (18-23 yrs–old) at De Montfort University (DMU, England).

POPULATION & STUDY DESIGN

Nutrient intake was collected from **109 (20.45 ± 1.17 yrs-old; 78 female)** DMU students from different ethnic backgrounds **(41 Asia, 41 Africa, 27 Europe)**, using a validated variant of the Nutrition Norfolk Food Frequency Questionnaire.

PGEs were analysed in scalp-hair provided by 73 of the participants (58 female) by ICP-MS. BMI was appropriately measured.

OUTCOMES

1. **Data was processed with the statistical package 'NADA' in R due to a high presence of censored results (100%, 75.34%, and 82.19%; for Pd, Pt and Rh, respectively).**
2. **Pt was detected in hair from sixteen female (median and IQR, in µg/g: 0.00014 (0.000036, 0.000551)) and two male participants (P95=0.00205, in µg/g)**
3. **Rh was detected in seven female (P95=0.0038, in µg/g) and six male participants (median and IQR, in µg/g: 0.00097 (0.00028, 0.00335)).**
4. **Only Rh showed sex-dependency.**
5. **Pt was positively correlated with fatty fish intake (r=0.292; p-value<0.05) and Rh with the intake of dairy products and fish (r=0.293, 0.286; p-value<0.05) and very positively with the intake of eggs, meat and crisps and snacks (r=0.311, 0.315, 0.335; p-value<0.01).**

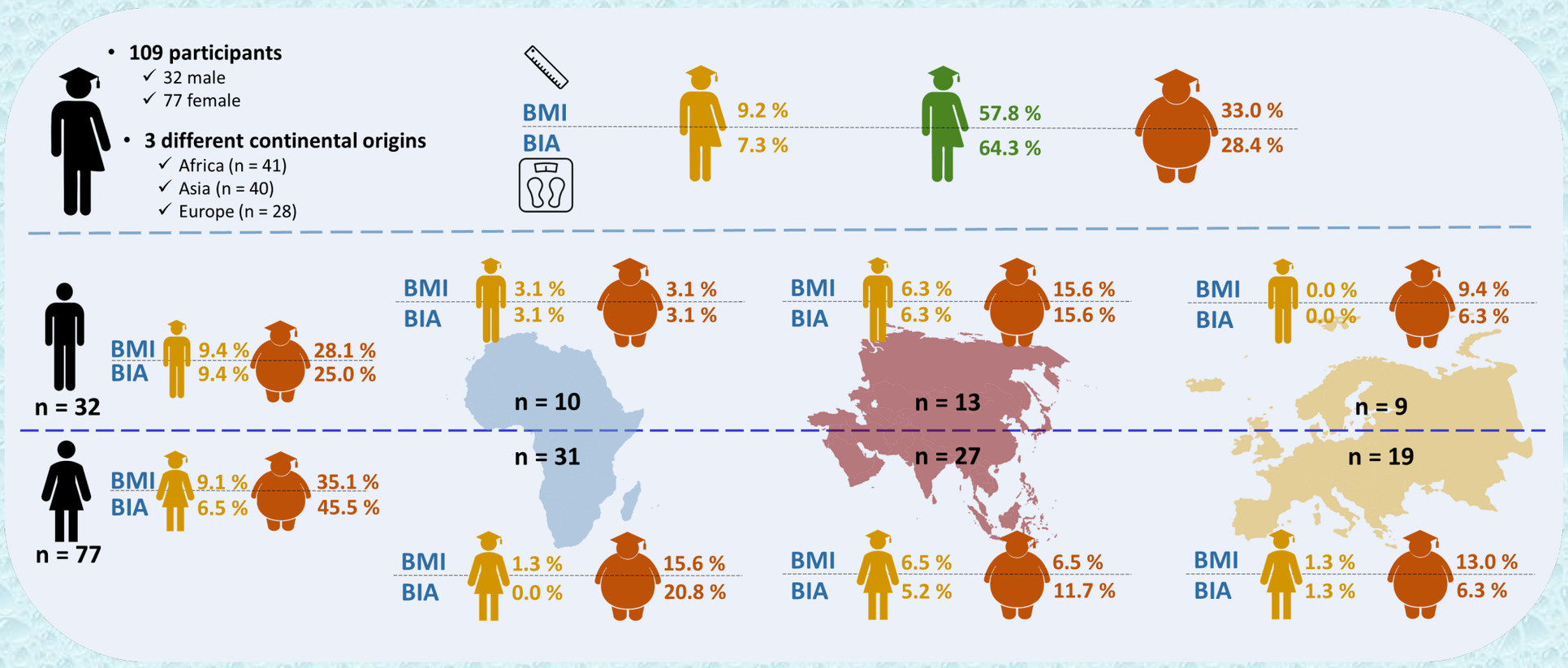

Figure 1. Underweight and overweight individuals in a sample of **young adults (18 to 22 years-old)** studying at De Montfort University (UK) based on their BMI and body fat percentage (BIA), depending on their ethnic background (continental origin).

CONCLUSIONS

- **The differences in the intake of eggs (17.625 vs. 16.998 g/day) and meat (271.55 vs. 193.06 g/day), which were higher in male counterparts, might explain our results.**
- **The differences found for Pt may similarly be explained by the fact that female participants ate more fatty fish (13.41 vs. 10.05 g/day).**
- **Our results suggest that DMU students would have experienced a minimal exposure to PGEs.**