EP044

QUANTIFYING POTASSIUM DISPLACEMENT: BEHAVIOURAL INSIGHTS FROM 24-HOUR URINARY BIOMARKERS FOR TARGETED DIGITAL NUDGING

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INTRODUCTION

- Potassium intake in Malaysia is critically low.
- Behavioural Driver: The "Potassium Displacement Effect"—high-sodium environments create dietary defaults that habitually replace nutrient-dense options.

OBJECTIVE

To quantify this behavioural failure using objective 24-hour urinary biomarkers.

METHODOLOGY

Study Framework: Data were obtained from the NHMS 2024: MyCOSS 2.0 , a nationwide study designed to represent the entire Malaysian adult population.

The Participants: 886 adults were selected using a multi-stage sampling method (ensuring data from various regions and demographics were included).

The Gold Standard: Sodium and potassium levels were measured using 24-hour urine collection—the most accurate method for tracking actual dietary intake.

Smart Analysis: We used a specialized statistical model (CSGLM). This wasn't just a simple correlation; it accounted for the complex "survey design" to ensure the results are true for the whole country.

The Goal: To calculate a "Displacement Coefficient" (β)—a single number that proves how much sodium is "pushing out" potassium in the Malaysian diet.

RESULTS

Results (Key Metrics):

- Mean Sodium: 2892.19 mg/day (95%CI: 2758.30-3026.07)
- Mean Potassium: 1141.25 mg/day (95%CI: 1096.50–1186.00)
- Na:K Ratio: 2.81 (95%CI: 2.64–2.98)

Statistical Analysis:

- $\beta = 0.063$, $R^2 = 0.189$, $p < 0.001$.
- Interpretation: High-sodium behavioural patterns significantly displace potassium at the population level.

DISCUSSION AND CONCLUSION

DISCUSSION: THE BEHAVIOURAL GAP

- The Problem: Our data reveals a severe nutrient imbalance where sodium levels significantly overshadow potassium intake.
- The Behaviour: This "Potassium Displacement Effect" confirms that high-sodium environments have created a dietary default, habitually "pushing out" nutrient-dense options from the Malaysian diet.
- The Link: The strong statistical association confirms that these sodium-heavy behavioural patterns are a primary driver of population-wide potassium deficiency.

RECOMMENDATIONS: OVERRIDING THE DEFAULT

We propose moving beyond traditional health education toward Behavioural Science solutions:

- Digital Nudges: AI-driven prompts in food-delivery apps to suggest potassium-rich additions at the point of purchase.
- Restructuring Defaults: Setting potassium-rich sides (fruits/vegetables) as the automatic choice in set meals.
- Choice Architecture: Redesigning digital menus to highlight heart-healthy options first, making the healthy choice the easiest choice.
- Smart Policy: Using biomarker data to incentivize replacing sodium with potassium-enriched alternatives in the food industry.

CONCLUSION

The identified biological gap validates the "Potassium Displacement Effect" as a dominant dietary behaviour in Malaysia, necessitating Digital Nudges to systematically override high-sodium dietary defaults.

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