A RETROSPECTIVE AND CROSS-SECTIONAL STUDY TO EVALUATE THE EFFECT OF ACCULTURATION ON THE DIETARY CALCIUM INTAKE AND PREDICTORS OF BONE MINERAL DENSITY IN FILIPINO WOMEN RECENTLY IMMIGRATED TO NEW ZEALAND

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Background

Filipinos in New Zealand have steadily grown in number over recent decades, and the majority undergo a dietary acculturation process, which is the dietary adaptation of individuals in their host country. In the Philippines, the nutrient with the highest inadequacy in the diet is calcium, which is primarily contributed by fish and indigenous vegetables that are not readily available in New Zealand. The aim of this study was to determine the effect of dietary acculturation on the calcium intake of Filipino women recently immigrated to New Zealand, and to explore the primary factors affecting their bone mineral status.

Methods

Current and previous dietary calcium intake was assessed using Food Frequency questionnaires. Serum 25(OH)D was measured from a venous blood sample, physical activity data from accelerometers, and bone mineral density (BMD) and body composition from dual-energy X-ray absorptiometry (DXA). Gross lean mass was calculated (total mass – [whole body total bone content + total fat mass]). The variables considered to be associated with bone mineral status were applied to a multiple regression analysis using the enter method.

Results

Healthy pre-menopausal Filipino women (N=62) were recruited in Auckland, NZ. Their median calcium intake in New Zealand following immigration was significantly lower than the intake in the Philippines (table 1).

Mean T-scores total hip and lumbar spine were within normal range (-1.0-1.0). The significant predictor of BMD was gross lean mass (Total hip P=0.016, Lumbar spine P=0.005), whereas current and previous dietary calcium intake, physical activity and serum 25(OH)D were not significant predictors.

Conclusions

These findings illustrate the potential detrimental consequences of dietary acculturation on the essential nutrient intake of immigrants. However, they also provide an opportunity to correct previous dietary inadequacies by exposing the participants to corresponding nutrient-dense foods from the host country.

Figure 1. Examples of calcium-rich fish (anchovies) and vegetables (water spinach) commonly consumed in the Philippines

Table 1. Comparison of dietary calcium intake in the Philippines versus in New Zealand (n=62)

	Philippines	New Zealand	P-value
Dietary calcium intake (mg d^{-1})	506 (358, 823)	418 (260, 620)	0.02†
EAR (mg d^{-1})	600‡	840§	–
% adequacy based on PH EAR	84.3	69.8	–
% adequacy based on NZ EAR	60.2	49.8	–

Values are medians and 25th and 75th percentiles
Abbreviations: EAR = estimated average requirement for the Philippines and New Zealand; NZ = New Zealand; PH = Philippines
†Differences between the Philippine intake and the New Zealand intake ($p<0.05$) Wilcoxon Signed-Rank Test, ‡Values based on 19–49-year-old females, § Values based on 19–50-year-old females

Table 2. Characteristics of participants(n=62)

Age, (years)	28.4 (26.2, 33.6)
Months in New Zealand	17.5 (9.8, 24.0)
Total hip T-score	-0.82±0.94
Lumbar spine T-Score	-0.82±0.95
Body fat percentage	34.8±4.7
BMI (kg/m^2)	24.6 (21.9, 28.7)
Serum 25(OH)D (nmol/L)	44.2±15.3
Percent <50nmol/L	69%

Values are either median (25th and 75th percentile) or mean±SD

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