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# Socioeconomic status, demographic factors and dietary quality of Lifeways study grandparents mapped from the 1948 National Nutrition Survey: associations with growth outcomes in their grandchildren at birth, 5, and 10 years

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Early-life experiences play a crucial role in shaping later-life outcomes, potentially impacting the health of multiple generations<sup>(1)</sup>. The 'Developmental Origins of Health and Disease (DOHaD)' theory underscores the significance of early environmental factors in influencing immediate and future well-being<sup>(2)</sup>; evidence dating back to the 1980s links exposures such as malnutrition to epigenetic changes and the development of chronic diseases<sup>(2)</sup>. Despite increasing interest in multigenerational associations, further empirical evidence is needed to fully understand the connection between grandparents' early-life experiences and the growth outcomes of their grandchildren. The objective of this research was to examine the relationship between grandparents' occupation group, population dietary quality (PDQ), and geographical area of residence in early-life and their grandchildren's growth outcomes at birth, 5- and 10-years, and to illustrate how the mapping of data from previous studies to recent studies based on socioeconomic status and demographic information can offer significant insights into health outcomes.

Data from the Lifeways Cross-Generational Cohort Study (2001-2013)<sup>(3,4)</sup> were used to identify children with at least one grandparent born after the foundation of the Irish Free State; thus, ranging from infancy to young adulthood when the 1948 National Nutrition Survey (NNS)<sup>(5)</sup> was conducted. The data from the grandparents of these children were then linked to the NNS categories of occupation group, PDQ and geographical area, based on information collected through the Lifeways baseline questionnaire. Associations between socioeconomic factors pertaining to maternal and paternal grandparents' and grandchildren's growth outcomes were tested statistically.

Significant associations were observed between female grandchildren's waist-z-scores (WACZ) at age 10 and the occupational group of the paternal grandmother ( $p = 0.030$ ). Female grandchildren of skilled workers exhibited larger median waist circumferences (67 cm) compared to those with professional paternal grandmothers (58.6 cm) ( $p = 0.049$ ). Poor PQD in both maternal grandmothers and grandfathers was positively associated with ponderal index (PI) in their female grandchildren ( $p = 0.022$ ,  $r = 0.169$ ;  $p = 0.002$ ,  $r = 0.252$  respectively) but not in their male grandchildren ( $p = 0.176$ ,  $r = 0.108$ ;  $p = 0.800$ ;  $r = 0.022$ , respectively). Conversely, good PQD in maternal grandparents was inversely associated with PI in their grandchildren ( $p = 0.041$ ,  $r = -0.111$ ;  $p = 0.035$ ,  $r = -0.125$ ). No association was observed between the early-life geographical area of residence of grandparents and their grandchildren's growth outcomes at any age.

This study contributes insights into the relationship between the socioeconomic factors and population dietary quality of grandparents and growth outcomes in their grandchildren. The study highlights the importance of grandparents' early-life experiences in shaping some growth outcomes in their grandchildren. This research also highlights how the mapping of data from prior studies to recent studies based on socioeconomic status and demographic data can provide valuable insights into health outcomes. Further research using this approach could lead to meaningful public health findings and is required to corroborate these study findings.

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