



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.

Aoife Mullen¹, Clare Corish¹, Alexander Douglass¹, Cecily Kelleher¹

¹ School of Public Health, Physiotherapy and Sports Science, University College Dublin



INTRODUCTION

The enduring impact of early-life adversity on the physiology and behaviour of individuals is believed to extend across generations. Since the 1990s, the DOHaD theory posits that exposure to specific environmental factors at crucial stages of growth and development can have notable consequences for an individual’s immediate and future well-being.

Research indicates that grandparents' experiences can influence their grandchildren's health outcomes, yet scant exploration exists on how grandparents' childhood socioeconomic status (SES) affects multiple generations' growth outcomes, especially in Ireland.

METHOD

Participants

Data from the Irish longitudinal cohort study 'Lifeways' was 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 National Nutrition Survey (NNS) was conducted (1946-1948). Grandparents included maternal and paternal grandparents.

Study design and mapping NNS data

Early life PQD, area, and SES of the grandparents of Lifeways children were assessed by mapping information on area, occupational group, and PDQ as defined by the NNS to those same grandparents based on the information provided in Lifeways (see mapping NNS section).

Outcomes

At birth: weight, length, head circumference (z-scores) and ponderal index (PI).
5 and 10 years: weight, height, waist circumference (WCAZ) (z-scores) and body mass index.

Statistical analysis

- Descriptive statistics are presented as frequencies and descriptives.
- One-way ANOVA and Kruskal-Wallis-1-way-ANOVA were used to explore relationships between grandparents’ occupational group and area and grandchildren’s growth outcomes.
- Pearson’s correlation and Spearman's rank were used to explore associations between two continuous variables i.e.. dietary quality and grandchildren’s growth outcomes.
- A p-value <0.05 is considered statistically significant.

AIMS

1. To explore the association of grandparental SES in childhood, including their occupational group, population dietary quality (PDQ) and residential area on the growth outcomes of their grandchildren at birth, 5-and 10-year intervals.
2. To illustrate how the mapping of data from previous studies to more recent studies based on socioeconomic status and demographic information can offer significant insights into health outcomes.

MAPPING NNS DATA TO LIFEWAYS

Area

Values of childhood area were generated by mapping the Lifeways grandparents’ address, provided at recruitment, to one of the five corresponding area categories defined by NNS: Dublin City, Large Town, Small Town, Rural and Former Congested District.

Occupational Group

Early-life occupational group category of the grandparents was categorised based on their own longest-held job title reported in the Lifeways questionnaire. If unavailable, the spouse’s job was used. Occupational group categories were defined by NNS: unemployed, unskilled, skilled, professional, small farmer and large farmer.

Population dietary quality

In the NNS, dietary quality for schoolchildren was determined based on clinical signs and classified by a trained medical examiner as ‘good’, ‘fair’, or ‘poor’. Percentages of good, fair and poor dietary quality were then calculated for categories of children based on their sex, age, father’s occupation and area of residence. As these values represent a percentage of a population that has good, fair, or poor dietary quality rather than dietary quality at the individual level, the values are referred to as ‘PDQ’ in this study.

Values of PDQ from the NNS were mapped to each grandparent in the Lifeways study according to their mapped NNS occupational group, mapped NNS area and sex.

RESULTS

1. Characteristics

Grandparents:

- The study included 1265 grandparents, most of whom lived in Dublin (n=492) and were from skilled occupational groups (n=311).
- Maternal grandparents had better dietary quality than paternal grandparents.

Grandchildren:

- Out of 614 grandchildren, 311 were female and 303 were male.
- Male grandchildren had higher birth weight, birth length and head circumference.
- At ages 5- and 10 years, growth outcomes were similar for both sexes (**p > 0.05**).

2. Associations between grandparent's area and grandchildren's growth outcomes

- No association at birth, 5 and 10 years (**p>0.05**).

3. a) Associations between grandparent's occupational group and grandchildren's growth outcomes

- No association at birth and 5 years (**p >0.05**)
- At 10 years, a significant association (**p<0.05**) was found between WCAZ and paternal grandmother’s occupational group (**p=0.029**).
- Grandchildren who had a PGM from a skilled worker family had a higher median waist circumference (66.9cm) than those whose PGM was from a professional family (60.80cm)

Table 1: Association between paternal grandmother occupational group and waist-z-scores at 10 years.

Paternal grandmother							P Value
Mean (SD)							
Unemploy	Unskill	Skill	Prof	FS	FL		
WCAZ (10 years)	0.81 (0.4)	0.58 (0.8)	1.34 (1.1)	0.39 (1.1)	0.32 (1.2)	0.58 (0.6)	0.029*

b) Sex Stratified analysis

- Occupational group of the PGM was significantly associated with WCAZ at 10 years (**p=0.030**) in female grandchildren only.
- Female grandchildren with a skilled PGM had a higher waist circumference (**67 cm**) compared to those with a professional PGM (**58.6 cm**).

CONCLUSION

- **Good maternal grandparent dietary quality** correlates with **lower PI in female grandchildren** at birth, while **paternal grandmothers' social class** affects **waist-z-scores in female grandchildren at 10 years**.
- The findings of this study suggest that the **SES of grandparents during early life can potentially influence the growth outcomes of grandchildren at birth and in childhood**, emphasizing the need to address such disparities for better future health outcomes
- **Mapping data from prior studies to more recent studies** based on SES and demographic data **can provide valuable insights into health outcomes**. Further research using this approach could lead to meaningful public health findings.

4. a) Associations between grandparent PDQ and grandchildren growth outcomes

- No association at 5 or 10 years (**p >0.05**)
- Poor PQD in MGM and MGF had a positive association with PI in their grandchildren (**p=0.008,r=0.144; p=0.013, r= 0.148**), respectively.
- Conversely, good PDQ in MGM and MGF had an inverse association with PI (**p=0.041, r=-0.111; p=0.035, r=-0.125**), respectively.

Table 2: Association between maternal grandparent population dietary quality and ponderal index.

	Population Dietary Quality											
	Maternal Grandmother						Paternal Grandfather					
	Good		Fair		Poor		Good		Fair		Poor	
	Rho (p)	P Value	Rho (p)	P Value	Rho (p)	P Value	Rho (p)	P Value	Rho (p)	P Value	Rho (p)	P Value
PI	-0.111	0.041	0.108	0.046	0.144	0.008	-	0.035	0.129	0.030	0.148	0.013
								0.125				

4 b) Sex Stratified analysis

- A positive association was demonstrated between MGM and MGF poor population dietary quality and higher PI in female grandchildren only.

Table 3: Association between maternal grandparent population dietary quality and ponderal index in female grandchildren.

	Population Dietary Quality											
	Maternal Grandmother						Maternal Grandfather					
	Good		Fair		Poor		Good		Fair		Poor	
	Rho (p)	P Value	Rho (p)	P Value	Rho (p)	P Value	Rho (p)	P Value	Rho (p)	P Value	Rho (p)	P Value
PI	-0.122	0.099	0.111	0.135	0.169	0.022	-0.141	0.090	0.144	0.084	0.252	0.002

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Relevant resources

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