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Original Research

Measuring the food and built environments in urban centres: Reliability and validity of the EURO-PREVOB Community Questionnaire

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SUMMARY

Objectives: The authors designed an instrument to measure objectively aspects of the built and food environments in urban areas, the EURO-PREVOB Community Questionnaire, within the EU-funded project 'Tackling the social and economic determinants of nutrition and physical activity for the prevention of obesity across Europe' (EURO-PREVOB). This paper describes its development, reliability, validity, feasibility and relevance to public health and obesity research.

Study design: The Community Questionnaire is designed to measure key aspects of the food and built environments in urban areas of varying levels of affluence or deprivation, within

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different countries. The questionnaire assesses (1) the food environment and (2) the built environment.

Methods: Pilot tests of the EURO-PREVOB Community Questionnaire were conducted in five to 10 purposively sampled urban areas of different socio-economic status in each of Ankara, Brno, Marseille, Riga, and Sarajevo. Inter-rater reliability was compared between two pairs of fieldworkers in each city centre using three methods: inter-observer agreement (IOA), kappa statistics, and intraclass correlation coefficients (ICCs).

Results: Data were collected successfully in all five cities. Overall reliability of the EURO-PREVOB Community Questionnaire was excellent (inter-observer agreement (IOA) > 0.87; intraclass correlation coefficients (ICC)s > 0.91 and kappa statistics > 0.7. However, assessment of certain aspects of the quality of the built environment yielded slightly lower IOA coefficients than the quantitative aspects.

Conclusions: The EURO-PREVOB Community Questionnaire was found to be a reliable and practical observational tool for measuring differences in community-level data on environmental factors that can impact on dietary intake and physical activity. The next step is to evaluate its predictive power by collecting behavioural and anthropometric data relevant to obesity and its determinants.

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Introduction

A rapidly growing body of research seeks to measure various aspects of the environment, particularly as they relate to diet and physical activity.^{1–9} Earlier studies have shown associations between area of residence and health behaviour,^{10–13} and between deprivation and opportunities to take physical activity or consume healthy food,^{14–19} contributing to the now well-established concept of ‘obesogenic environments’.^{20–24} An environmental approach is a potentially effective element of strategies encouraging healthy living for all.^{22–24}

Instruments have previously been created to identify and measure health-related aspects of the environment, but have tended to focus on either diet or physical activity, but not both together. We are only aware of one other study which has designed and tested an instrument assessing multiple environmental factors.²⁵ Most others have well documented reliability, but focus on attributes of the built environment, which includes man-made structures such as homes, schools, workplaces, parks and recreation areas, greenways, transportation systems, and motor vehicles.⁷ A distinction is made between objective (e.g. through systematic observation)^{26–30} and subjective (e.g. through questionnaires on experience and perceptions of individuals)^{31,32} instruments. Measurement of the different elements of the food environment is less well understood, and few reliable, standard measures exist.^{2–4,8,9} Even fewer have been tested in a range of countries. This is important given the wide diversity of both environments and rates of obesity and its determinants, making Europe a natural laboratory for research on the environmental determinants of obesity. It is also apparent that instruments developed in the USA, where most work has been done, should not simply be applied to different contexts elsewhere without detailed consideration of the different patterns of habitation and socio-economic dispersion, meanings of words (such as ‘convenience stores’ and ‘supermarkets’), and behaviours; ideally such instruments

should be validated in the European context.¹ Another consideration is that some research in North America involves the use of sophisticated geocoded databases that are not available in many European countries.³³

Relatively few studies have looked at differences in the socio-economic status of the areas studied, with the exception of a body of work on what are termed food deserts.^{34–37} There is, however, overwhelming evidence that socio-economic status, most often expressed as income, employment or education, impacts on levels of obesity as well as choices and opportunities for healthy diet and physical activity,^{24,38} with evidence from many different countries.^{39–47} A social gap in obesity has been reported in many European countries, with the highest obesity levels among the most disadvantaged.^{48–56}

The authors designed an instrument to assess objectively aspects of the built and food environments in socioeconomically diverse urban areas. It was developed as part of the EU-funded project ‘Tackling the social and economic determinants of nutrition and physical activity for the prevention of obesity across Europe’ (EURO-PREVOB) and was pilot tested in the centres of Ankara, Brno, Marseille, Riga, and Sarajevo. This paper reports on the EURO-PREVOB Community Questionnaire’s development, reliability, validity, feasibility and relevance to public health and obesity research.

Methods

Literature review

A literature search was conducted, using PubMed, to identify *observational questionnaires* designed to assess key aspects of the *obesogenic environment*, especially those related to nutrition and physical activity. The objectives of the literature search were (1) to identify existing reviews of the literature and articles on existing tools, and (2) to inform the contents and

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