



Evaluating the free school breakfast initiative in Wales: methodological issues

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Abstract

Purpose – The purpose of this paper is to report findings on an initiative set up by The Welsh Assembly Government to provide free, healthy breakfasts to primary school children throughout Wales.

Design/methodology/approach – The research employed a cluster randomised controlled trial design with 58 schools in South, West and North Wales. Quantitative measures were taken at baseline, four months and 12 months.

Findings – With the injection of more money and effective services it was found that the free school breakfast initiative could help improve health and social inequalities.

Originality/value – This paper provides some of the background to the initiative, describes the evaluation and highlights some of the key methodological issues that arose during the course of the research.

Keywords Children (age groups), Primary schools, Nutrition, Government, Wales

Paper type Research paper

Why is breakfast so important?

It is often said that breakfast is the most important meal of the day. Indeed, there is substantial evidence to indicate that breakfast consumption is associated with a wide range of benefits. For example, laboratory research shows that consumption of an adequate breakfast is linked to short-term improvements in attention (Wesnes *et al.*, 2003; though see also Smith *et al.*, 1994), memory (Benton and Parker, 1998; Benton and Sargent, 1992; Smith *et al.*, 1992, 1994, 1999; Wesnes *et al.*, 2003 though see also Cromer *et al.*, 1990) mood (Lloyd *et al.*, 1996; Smith *et al.*, 1994, 1999, though see also Benton *et al.*, 2001), and possibly motivation (Benton *et al.*, 2001). Likewise, experimental studies conducted in school settings[1] have also shown positive effects of breakfast on memory (Vaisman *et al.*, 1996), arithmetic (Powell *et al.*, 1998), verbal fluency (Chandler *et al.*, 1995), physical endurance (Wyon *et al.*, 1997), creativity (Wyon *et al.*, 1997), and on-task behaviour (Bro *et al.*, 1994).

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Breakfast can also represent an opportunity to consume nutrient rich foods, and in this way contribute towards a healthy diet. For example, research[2] suggests that skipping breakfast is associated with poorer nutrition (Morgan *et al.*, 1986; Nicklas *et al.*, 1998a; Nicklas *et al.*, 2000; Nicklas *et al.*, 1998; Ruxton and Kirk, 1997) and a greater body mass index (Ruxton and Kirk, 1997; Siega-Riz *et al.*, 1998) whilst breakfast consumption is linked to a healthier diet and lifestyle more generally (Nicklas *et al.*, 1998b; Smith, 1998).

School breakfast programmes

The nutritional and educational benefits of breakfast consumption has led to a number of government funded school breakfast initiatives (e.g. see Shemilt *et al.*, 2003). These were first employed in North America in 1966 and aimed to improve the nutritional status of children in deprived areas (Friedman and Hurd-Crixell, 1999). Since then, the number of schools participating in such programmes has risen dramatically, so that by 1997 approximately six million children in the US were attending a school breakfast club each day (US Department of Agriculture, 1999). In the UK, the introduction of breakfast programmes has occurred more recently, with funding becoming available from sources such as the Education Action Zone initiative, New Opportunities Funding and Sure Start out of School Funding. The Department of Health also introduced a pilot initiative in 1999. However, the objectives of these different breakfast clubs have varied considerably from one another; whilst some have focused on the provision of a healthy breakfast, others have placed more emphasis on childcare, education, or informal interaction between children and school staff (Shemilt *et al.*, 2003). Indeed, a breakfast club may not necessarily provide breakfast.

Nevertheless, there is evidence[3] to suggest that school breakfast programmes can help improve nutrition and may also be associated with improvements in attendance, academic performance and behaviour (e.g. Belderson *et al.*, 2001; Bro *et al.*, 1994; Hanes *et al.*, 1984; Kleinman *et al.*, 2002; Murphy *et al.*, 1998; Pollitt, 1995; though see also Friedman and Hurd-Crixell, 1999). The potential impact of school breakfast programmes on health and social inequalities is therefore considerable. However, most of the studies that have evaluated school breakfast programmes have been unable to incorporate appropriate control groups or have suffered contamination between trial arms. Thus, although there is good reason to believe that breakfast programmes can have a wide range of beneficial outcomes, this has yet to be convincingly demonstrated.

The Welsh Assembly Government Primary School Free Breakfast Initiative

Within this context, the Welsh Assembly Government is working to improve the health and wellbeing of children and young people in Wales. As part of this strategy they are piloting a school breakfast initiative. This scheme aims to provide all primary school aged children in maintained primary schools in Wales with the opportunity to have a free, healthy breakfast each day, with the aim of improving children's health and educational attainment. Breakfast provision takes place before the start of school each day and consists of a choice of four items from the following food groups: drinks or milk products; cereal (not sugar coated); fruit; breads. More information about the scheme can be found at: www.learning.wales.gov.uk/breakfast

Significantly, the Assembly Government took the decision to phase the introduction of this major policy initiative to allow for a period of testing, adjustment and evaluation. Although we have seen a growth in the use of such policy pilots in the UK in recent years, they remain the exception rather than the rule. This has led to calls for more collaboration between researchers and policy makers and the increased use of pilots in evidence based policy (Jowell, 2003). The Cardiff Institute of Society, Health and Ethics (CISHE) at Cardiff University successfully tendered for the contract to evaluate the scheme. This paper highlights some of the main methodological concerns that arose during the early stages of the evaluation. It is hoped that these will highlight potentially useful issues for researchers and policy makers in the area.

Evaluating the school breakfast initiative

Randomised controlled trials (RCTs) are generally considered to be the most reliable means of assessing intervention efficacy (e.g. see Campbell *et al.*, 2000). Since public health interventions, such as the school breakfast initiative, tend to act at multiple levels and through multiple channels (Speller *et al.*, 1997) it makes them difficult to evaluate using a traditional RCT methodology. It is likely that these methodological difficulties have contributed to the absence of good evidence for the efficacy of school breakfast programmes and other public health interventions. However, recent developments in research methodology, including the use of cluster RCTs, and mixed methodologies have the potential to provide an unbiased estimate of the effectiveness of such interventions as well as identify other factors that are more variable such as intervention delivery, context and support (Moore *et al.*, 2003).

Our evaluation of the Welsh Assembly Government Primary School Free Breakfast Initiative drew on these recent methodological developments. It employed a cluster RCT design to provide an unbiased estimate of the impact of the scheme on a variety of key outcomes and an embedded process evaluation to address issues concerning the context and implementation of the initiative. In this way, the evaluation not only addressed the question, “Does it work?”, but also “What works?”, “For whom?” and “Under what circumstances?”

Study design

Quantitative outcome measures were taken at baseline, four months and 12 months. An outline of the study design is shown in Figure 1.

Recruitment, randomisation and participants

Head teachers of infant, junior and primary schools located in “Communities First” (i.e. deprived) areas in nine local education authorities (LEAs) in North, South and West Wales were invited to participate in the evaluation. Schools were offered £250 to compensate for additional teacher time and disruption to school activities. A total of 152 schools were approached and 58 schools agreed to participate. Reasons for non-participation were generally related to the running of the breakfast scheme itself (including having to delay or bring forward the start date) rather than any concerns over data collection burden. Those that agreed to participate were randomised to the intervention or control condition using strata defined by LEA, school size, free school meal entitlement and Welsh language medium. Schools in the intervention group were asked to set up a breakfast scheme, following the guidance issued by the Assembly

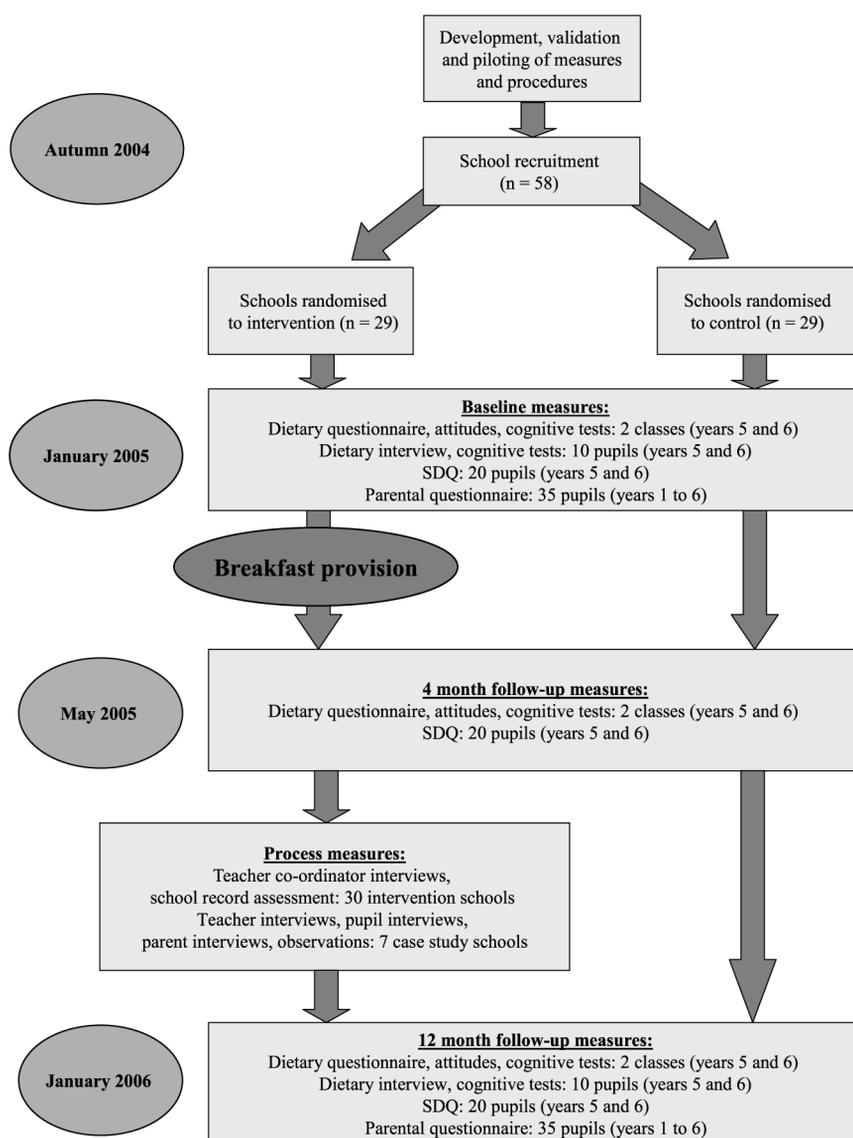


Figure 1.
Study outline

Government, after the baseline measures had been taken. Schools in the control condition were asked to refrain from setting up a breakfast scheme until after the 12 months measures had been taken.

In each of the 58 schools, one class of Year 5 children (9-10 years) and one class of Year 6 children (10-11 years) were randomly selected to complete class-based measures. A further ten children from each of these years (i.e. 20 in total) were randomly selected to be assessed by teachers (see below) and of these ten children, 3-5 from each year (6-9 in total) were randomly selected to participate in individual testing.

In addition, five children from each year (i.e. years 1-6 consisting of children aged 5-11 years, 580 children in total) were randomly selected and a questionnaire was sent to their parents.

Outcome measures

The quantitative measures aimed to provide an accurate assessment of the impact of the scheme on children's dietary habits, cognitive performance, attitudes and classroom behaviour. However, in the evaluation of many school based health interventions there is a tension between the rigour of the study design and the accuracy of the measures. As noted above, RCTs are generally considered to be the most reliable means of assessing intervention effectiveness (e.g. see Campbell *et al.*, 2000). This means that for school-based interventions the school has to be the unit of analysis. As a consequence, relatively large numbers of participants are needed to detect any intervention effect. In order for such an evaluation to be feasible this will generally mean that the outcome measures will need to be relatively quick, cost-efficient and easy to implement. However, time and cost efficient measures are often associated with more error and more bias and thus may provide misleading results or may not be sensitive to changes brought about by the intervention. This is particularly true in the case of dietary assessment with children (see Moore *et al.*, 2005).

In an attempt to address these difficulties our evaluation incorporated two levels of dietary assessment. The first used a less sensitive dietary recall questionnaire administered at the class level whilst the second used a validated, and much more time consuming, dietary interview procedure administered at the individual level with a smaller sample of children. This approach was also taken in the assessment of cognitive performance with a selection of tasks being administered to large groups of children at the class level and a series of individual, computerised tests being administered at the individual level with a smaller subset of these children. The full range of outcome measures consisted of the following:

- A classroom administered brief dietary recall questionnaire to assess breakfast skipping during the week and provide an indication of the types of foods consumed for breakfast and throughout the day. The questionnaire was a modified version of the Day in the Life Questionnaire (Edmunds and Ziebland, 2002) and asked children to describe everything they had to eat or drink at various points during the previous day and during that morning before school (e.g. on the way to school, at school before class started, morning break). These items were ordered chronologically and were embedded within other items that related to the child's activities (such as how they travelled to school). These latter items were designed both to act as memory prompts and to reduce social desirability bias by drawing attention away from the researchers' interest in food consumption. Due to the difficulties associated with children's assessment of portion size (Livingstone and Robson, 2000; Lytle *et al.*, 1993), questions about portion size were not included. This also helped keep the questionnaire relatively brief and easy for the child to complete with minimal assistance.
- Individually administered dietary recall interviews to provide a more accurate estimate of the impact of the initiative on children's diets. These interviews were conducted using a standardised protocol based on that used by Lytle *et al.* (1993). The interview procedure had the advantage that: it was a validated measure; it

allowed the researcher to check children's responses and to jog their memories if recall was proving difficult; and it allowed ascertainment of portion size. Data collected in these interviews are suitable for entry and analysis in a specialised package designed to estimate intake of specific nutrients. Such analysis will allow detailed nutritional outcomes to be assessed, including consumption of an adequate breakfast (i.e. over 20 per cent of daily energy intake) and intake of micronutrients (e.g. calcium, iron, vitamin C).

- Classroom administered cognitive tests to assess different aspects of memory and attention that have been shown to be sensitive to the effects of breakfast (Smith *et al.*, 1993; 1994; 1999). The tests measured episodic memory, working memory, retrieval from semantic memory and selective and sustained attention.
- Individually administered, computerised cognitive tests to assess speed of encoding of new information, sustained attention and psychomotor speed.
- A classroom administered questionnaire to measure children's attitudes, norms and intentions in relation to breakfast. Attitudes, norms and intentions are all believed to be important determinants of behaviour (Ajzen and Madden, 1986). The questionnaire was developed specifically for the evaluation and included 13 items relating to children's attitudes towards breakfast, three items relating to attitudes towards healthy foods, two items relating to breakfast eating intentions and five items relating to breakfast eating norms.
- The Strengths and Difficulties Questionnaire (Goodman, 1997), completed by teachers to assess children's classroom behaviour. This was a relatively brief, but well-established questionnaire that assessed five dimensions of behaviour: hyperactivity, emotional symptoms, conduct problems, peer problems and prosocial behaviour.
- A parental questionnaire developed specifically for the evaluation. This assessed: children's breakfast skipping behaviours on weekdays; children's breakfast skipping behaviours at the weekend; and the family's morning routine on weekdays (e.g. childcare arrangements and transport to school). By examining changes in children's consumption of breakfast at the weekend, this measure gives some indication of whether the scheme is successful in altering children's breakfast eating habits.

Process measures

Whilst recognising the need to adopt appropriate research designs and to draw on theoretically informed outcome measures to evaluate complex interventions, it is of equal importance to understand processes (Springett, 2001). The evaluation therefore incorporated a substantial process element that examined how the initiative had been implemented. This will facilitate the interpretation of outcome effects and add to the understanding of how a major policy initiative is undertaken.

An initial preliminary process evaluation was also completed with schools who began provision of free breakfasts during the first wave roll out in September 2004. This consisted of telephone interviews with the WAG breakfast team, LEA co-ordinators and questionnaires with school based co-ordinators. In addition, a number of case study schools were selected for an in-depth observational and interview study with teachers, caterers and pupils. This preliminary study allowed process

measures and an appropriate design to be developed and piloted before the main process evaluation was undertaken. Results also formed the basis of a report to WAG on the initial implementation with recommendations for policy and practice..

The main process evaluation included telephone interviews with LEA co-ordinators and a semi-structured postal questionnaire for school based co-ordinators. Following lessons learnt from the preliminary study, the questionnaire examined the following areas:

- *Context.* Existing dietary health promotion activity to determine the relationship between school climate, implementation and outcomes (Gittleston *et al.*, 2003).
- *Fidelity and dose.* Details of initiative content and a comparison of daily record keeping for the Assembly Government and for guidance documentation.
- *Integration.* Details of existing, and any changes to, school policies and the level of integration with curriculum and extra-curricular activities.
- *Recruitment, participation and reach.* Approaches to promotion and recruitment, any use of targeted recruitment, level of, and explanation for, participation and non participation.
- *Implementation and sustainability.* Barriers and facilitators to implementation, level and type of staff involvement, level and type of parental involvement, in and out of school time involved, direct and indirect financial costs, benefits and costs to school, staff, pupils and parents.

In addition, eight participating schools were selected to act as case studies to explore issues raised within the semi-structured teacher interview and daily implementation records. School selection was determined by information gathered from the teachers, uptake records and school characteristics. In this way a range of approaches to, and experiences of, implementation were examined. In these schools, semi-structured interviews were conducted with head teachers, teachers and caterers whilst school co-ordinators were asked to complete a questionnaire. Semi-structured interviews were also conducted with participating pupils in each school. Interviews examined pupils' accounts of any changes to dietary behaviour, school behaviour, attitudes and norms as well as views on, and experiences of, the initiative. Finally, observational records were taken of the delivery of the intervention in each of the case study schools.

Conclusions

If we are to bring about improvements in health and social inequalities we need to ensure that money is invested into services that are effective. Unfortunately the evidence base for the identification of effective interventions is limited (Wanless, 2003, pp. 53-54). To this end, it is vital that new policy initiatives are piloted and rigorously evaluated. Unfortunately, new initiatives are often implemented in a way that makes such evaluation impossible. For example, the implementation timetable may be too short to allow for study design and recruitment, the rollout strategy may provide no opportunities for randomisation and the evaluation budget may be insufficient for a RCT. However, with increased dialogue between policy-makers and researchers, it becomes possible to take account of such factors. The Free School Breakfast Initiative represents a good example of how a new policy initiative can be implemented to enable

a rigorous evaluation. It also represents an important opportunity to demonstrate the feasibility and value of using cluster randomised trials for this purpose.

Notes

1. Conducted in the USA with the exception of Vaisman *et al.* (1996) which was conducted in Israel, and Powell *et al.* (1998) and Chandler *et al.* (1995) which were conducted in Jamaica.
2. Conducted in the USA with the exception of Ruxton and Kirk (1997) who additionally review data from the UK, Republic of Ireland, Spain and Norway, and Smith (1998) who employed a UK sample.
3. From research conducted in the USA with the exception of Belderson *et al.* (2001) which was conducted in the UK.

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