Evidence Brief

University of Southampton

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What is the evidence to support the use of Birthrate Plus® to guide safe staffing in maternity services?

The Ockenden review of maternity services at the Shrewsbury and Telford NHS Trust highlighted the urgent need to ensure adequate staffing levels in maternity care and called for a review of the feasibility and accuracy of the Birthrate Plus tool and associated methodologies. Birthrate Plus® is a system that is used to guide workforce planning for midwifery, informing decisions about the number of midwives to employ in order to maintain safe and high quality care (establishment setting). In this review we consider the available evidence to support the use of Birthrate Plus based on a recently published systematic scoping review.

Background

Birthrate Plus® (BR+) was developed in the late 1980s and is now widely used throughout the UK National Health Service (NHS) and in several other countries. The system is designed to ensure sufficient midwives are employed so that one to one midwifery care is available to those giving birth.

The BR+ system takes account of multiple aspects of pre-natal and post-natal care. It assesses demand for labour and delivery care using five categories. These five categories classify the complexity of maternity cases, which in turn informs staffing requirements. Those in higher categories require more time from midwives, and so services with more complex cases require a larger midwifery establishment to meet need. More recently, the system has been adapted to provide a real-time measure to help match staffing to immediate demand. The toolkit was endorsed by NICE on the basis that it addressed the majority of factors necessary to determine staffing requirements, as identified in the NICE guideline on safe midwifery staffing for maternity settings [1 , 2].

BR+ is often described as 'validated' and 'evidence based'. In this evidence brief we summarise a recently published review of the evidence to support the use of BR+ [3].

Review Questions

We considered evidence within a framework based on questions and issues highlighted in reviews of evidence for nurse staffing methods [4].

- What evidence is there for the reliability and validity of BR+ assessments or the resulting establishment estimates?
- What evidence is there for the usability / perceived usefulness of BR+ in workforce planning?
- What evidence is there for the impact of BR+ based establishments on planned / achieved staffing?
- What evidence is there that BR+ addresses variability in demand within services (day to day and hour to hour)?
- What evidence is there for the impact of BR+ on quality of care / outcomes for parents / babies?
- What are the costs and / or cost effectiveness of using BR+?
- How does BR+ compare with other methods to determine staffing in maternity services?

Methods

We searched PubMed, Medline, CINAHL, Google Scholar, Scopus, Academic Search, British Library Ethos, Directory of Open Access Journals & Science Direct. Initial searches were undertaken in June 2021. The search was modified and undertaken again in December 2022. We also searched the BR+ website and sources identified as evidence by the BR+ team.

We excluded reviews and general discussion / news pieces but scrutinised the reference lists of any that were of direct relevance. We included only sources providing some data-driven evidence unless it was offered as evidence by BR+. Full details of this review, including all included studies are published as open access [3].

Results

We identified 23 sources of evidence for review of which 15 were published in peer reviewed journals of which two were available only as abstracts. Eleven of the included sources were co-authored by Ball who developed BR+. Of these eleven sources, six provided data arising from the use of the BR+ tool, although all are largely descriptive, focussing on the use of the tool. Most evidence was based on the results of BR+ assessments undertaken for workforce planning.

The remaining 12 sources were diverse. In many studies the data did not extend far beyond simply reporting the results of applying BR+ to particular services. In some cases, use of BR+ was somewhat incidental and any inference made about BR+ is indirect. Fourteen studies were best characterised as observational descriptive studies while three were more analytical, using simulation models. We found no intervention studies.

While we do not offer a detailed methodological critique of the studies, none would be considered as providing robust evidence of the benefits or accuracy of Birthrate Plus using traditional hierarchies of evidence. Many of the inferences made are indirect or based on weak or imprecisely reported evidence.

Reliability, validity & comparison with other tools

Nine sources were judged to offer some evidence of reliability and validity of the tool, although none compared results of the BR+ assessment with other tools. Claims for reliability were based on the accuracy of midwives recording time and application of categories. There was little if any detail to explain how this was assessed.

Several sources offer support for the validity of the BR+ categories by showing increasing midwifery time associated with higher categories. Indirect evidence about validity comes from two studies. A simulation study used BR+ in a model of different service configurations in 2 hypothetical NHS Trusts and found that the proportion of community births made little difference to staffing requirements, providing indirect validation of BR+ based staffing estimates. A study of Dutch midwifery services found that time allocations and caseloads inferred using the BR+ categories were dramatically different from current practice, although the direct relevance of this is unclear other than to raise questions about the generalisability of the method when other aspects of the health system change.

Usability, Perceived Usefulness, and impact on staffing

While 16 of the 23 studies were assessed as offering some evidence of the usability of the tool, the evidence was almost exclusively based on the conclusions or assertions of authors rather than direct data-driven evidence. BR+ is said to have usefully guided changes to service delivery and led to increased staffing. BR+ is widely used, and several studies show estimated staffing requirements that differed from baseline levels in the services studied, and so would lead to change if implemented. One study used a tool based on BR+ to measure real-time demand and to guide an escalation protocol to deal with variation in demand. There was considerable variability in demand and frequent understaffing. Authors concluded that real-time monitoring using this tool was useful.

No evidence about staff perceptions and experiences of using the system, or the work involved, was found, although several reports made reference to the system's usefulness and ease of use.

Accommodating variability

Several studies provided evidence of variability in demand for maternity care within days and from day to day. Demand, as measured by BR+, is highly variable. To accommodate variability and peaks of demand, BR+ makes an allowance of 15% capacity when estimating required establishments. Two studies showed demand frequently exceeding the capacity of available staff, but it was unclear if the establishments had been set using BR+ and so inferences about the ability of BR+ based establishments to meet variable demand cannot be made from these studies.

Outcomes

A single study addressed the impact of staffing below the BR+ recommended levels on delays in induction of labour. Observational data showed no association between staffing shortfalls and delays in induction in labour, although a simulation model suggested that staffing interventions including reducing shortfalls would reduce delays. No other evidence of effects on quality of care or outcomes was found. No evidence of cost-effectiveness was found.

Conclusions

We found a significant body of published work including peer reviewed publications describing the use of BR+. However, the extent of data-driven evidence is very limited. Much of the independent research has taken BR+ as a given, although results have provided some insights into variability across settings. There is essentially no evidence of the benefits of using Birthrate Plus compared to other approaches to setting establishments. The lack of evidence from independent researchers mirrors that for widely used tools for setting nursing establishments [4].

There is sufficient evidence of associations between midwifery staffing levels and outcomes to infer that increases in staffing levels guided by BR+ are likely to be associated with improved quality of care and safety [5]. Whether the BR+ categories provide the most reliable or precise groupings to estimate relative demand cannot easily be determined but there is evidence that staff time increases for higher categories. On the other hand, there is also evidence that demand for care within categories could be highly variable and it is unclear if the BR+ recommended staffing levels are optimal. Further assessment of the tool is needed including research to ascertain the precision of underlying estimates, the ability of BR+ based establishments to deal with variable need, and comparison with alternative approaches to setting establishments.

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References

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