2013

Computerisation of perinatal data entry: is the data accurate?

Alison Craswell
University of Wollongong, ajc558@uowmail.edu.au

Lorna Moxham
University of Wollongong, lmoxham@uow.edu.au

Marc Broadbent
Central Queensland University

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Abstract

Perinatal data (PD) is collected for mothers and babies Australia wide as mandated at a federal level. The data is used to monitor patterns in midwifery, obstetric and neonatal practice and health outcomes and is also used for research purposes, funding allocation and the education of midwives and medical officers. Accuracy in PD is most often reported via quantitative validation studies of PD collections both internationally and within Australia [1]. These studies report varying levels of accuracy in PD collection and suggest researchers need to be more aware of the quality of data they use. This paper presents findings from doctoral research that regarding issues of concern identified by midwives relating to their perceptions of the accuracy of computer PD records. Research, such as that presented in this paper, may improve the robustness of the PD collection and allow for more accurate planning of health services.

Disciplines

Medicine and Health Sciences | Social and Behavioral Sciences

Computerisation of perinatal data entry: Is the data accurate?

Alison CRASWELL [a,1], Lorna MOXHAM [a] and Marc BROADBENT [b]

[a] *Faculty of Sciences, Medicine & Health, University of Wollongong*
[b] *Institute of Health & Social Science Research, CQUniversity*

Abstract. Perinatal data (PD) is collected for mothers and babies Australia wide as mandated at a federal level. The data is used to monitor patterns in midwifery, obstetric and neonatal practice and health outcomes and is also used for research purposes, funding allocation and the education of midwives and medical officers. Accuracy in PD is most often reported via quantitative validation studies of PD collections both internationally and within Australia [1]. These studies report varying levels of accuracy in PD collection and suggest researchers need to be more aware of the quality of data they use. This paper presents findings from doctoral research regarding issues of concern identified by midwives relating to their perceptions of the accuracy of computer PD records. Research, such as that presented in this paper, may improve the robustness of the PD collection and allow for more accurate planning of health services.

Keywords. (MeSH) Data Collection, Data quality, Attitude to computers, perinatal nursing, Midwifery, Australia

Introduction

PD is collected for mothers and babies Australia wide as mandated at a federal level. The data is used to monitor patterns in midwifery, obstetrics and neonatal practice as well as for the planning of health services, research and the education of midwives and medical officers [2]. In Queensland the collection of PD has recently moved to an eHealth format from the traditional paper form, which is reported to improve data quality, enhance accessibility, produce cost savings and improve the timeliness of the availability of collected data items [3]. Data presented in this paper was gathered as part of a larger study the authors are undertaking which examines the influences on midwives during the process of entering PD into the computer. Only data from the analysis that lies within the theme of perceived data accuracy is presented and discussed here.

1. Method

Grounded theory (GT), qualitative methodology that has an inductive orientation, was used in this study to add a depth of discovery that may otherwise not have occurred with a quantitative approach. The voice of the midwife was captured and is considered important in determining what happens as it provides an experiential point

of view [4]. Purposive sampling was used to interview participants in line with GT methodology. This approach ensured that data was captured from participants with knowledge and experience entering PD into a computer for collection. Later, theoretical sampling, an approach that adds and refines properties and dimensions to acquire an in-depth understanding of analytical categories [5], was used to gather data from participants who would fill the gaps in the developing theory. By the end of data collection, 14 midwives and one health information manager from twelve different hospitals across Queensland using three different systems for entering PD participated in this research. The participants held a variety of positions within their organisations and ranged in experience from level one midwives to level three clinical nurse consultants and educators. Some participants also held the position of PD coordinator for their unit, which has the added role of validating and extracting PD regularly at the end of an allocated period to be sent to Queensland Health.

Adhering to GT methods, the sample size was not pre-determined but influenced by saturation of the data rather than a specific required number of participants to meet generalisable sampling requirements [6]. Saturation of the data occurred when no new information emerged from interviews and the theoretical framework was sufficiently populated to explain the phenomena under study [7]. Participants were asked an initial open-ended question which was designed to encourage a full meaningful answer using the midwives own knowledge and experiences around the research topic. Ethical approval for the research was obtained from the University of Wollongong Human Research Ethics Committee in 2012 with the research design adhering to the principals of justice, respect and beneficence [8]. Data was analysed using constant comparative method, again maintaining consistency with grounded theory methods. NVivo data management software was used to assist with organisation of the data.

2. Findings

The findings that are presented here deliberately use the participants' own words with ensuing discussion on the emerging categories. These direct quotes can be identified using 'I' = interviewer and 'P' = participant. A major theme that emerged from the research, namely perceived data accuracy, highlights participants concerns over the accuracy of PD entries. This theme is made up of the elements: a) accuracy in records, both completed computer records and written records and b) data standards, both obstetric and computer system standards. These contributing elements can be seen in Figure 1. Participants themselves questioned: Data is entered into a computer for PD collection but is the data entered accurate?
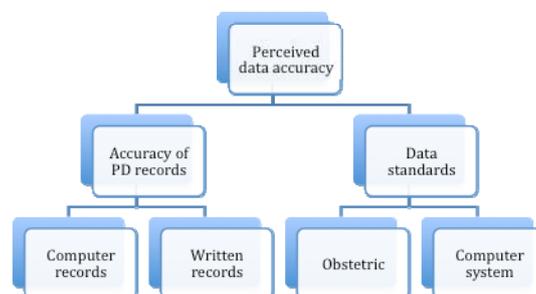
Figure 1. Theme Perceived data accuracy and contributing categories

2.1.1. Accuracy of PD records

2.1.1.1. Accuracy in computer records

It was generally felt by participants that moving to an eHealth platform for submission of PD had improved the accuracy of the data entered. Midwives found that the process of validation before completing an online PD entry forced them to enter data into fields that were easily left blank on the old paper record. Field validation is a construct of particular software that means data entered must fit set parameters for the page to move on or be saved. Midwives with the added role of PD coordinator for their particular unit perceived that the number of returning errors from the PD unit in Queensland Health to be less than when the collection was done by paper form. This was confirmed during discussions with staff at the central collection unit in Brisbane (C. Morris 2011, pers. comm., 9 Feb) and also when examining hospital error reports and graphs published in Perinatal Data newsletters [3, 9]. One participant reported a 2 to 3 month lag time while using paper PD forms but this has subsequently improved since using a computerised extract of data.

However, some participants also reported knowledge of inaccuracies in the completed and validated records. One participant reports:

> "I can look in it (the record), but unless I sit there with the chart and check the entries I don't know whether the data's correct or not. No one does."

Another reported:

> "We had no faith in the data from here because we knew it was very inaccurate even with the validation process. "

These inaccuracies were not considered acceptable and as a means of improving the quality of the information being sent to Queensland Health, some hospitals employ a PD coordinator full time to check, correct and complete the forms that midwives have entered data into at the point of care. With this model in place, participants report being able to ensure the data is accurate.

> I: "So you think once you've done your clean, you're fairly confident the data's accurate?
> P: Yep, complete and accurate."

The value of accurate PD can also be seen by some units giving midwives between 4 and 8 hours a week offline time to check, complete and validate records prior to extracting the data to the PD unit. The perceived level of accuracy reported from participants of these units varies from good to unknown. Accuracy does depend on a number of influencing factors including business in the unit.

Participants reported that when they were busy or pressed for time, they enter less data into the PD record.

> "I try not to skip over things, but I'm sure if I went down through all the, you know, adding things in, I'm sure we could pick up a lot more. Because I'm in a rush and someone else is just about to deliver and I need to go in there as well."

These busier times also attract more casual or agency midwives who are not familiar with the system for entering PD but are in some units still required to enter their own PD. Midwives reported this as resulting in less completions and less accurate records.

2.1.1.2. Accuracy in written records

When entering PD, participants report utilising a combination of memory and the written chart. It was reported that the easiest and quickest entry of PD occurred in birth suite immediately after a woman had birthed when all the data was fresh in the midwife's mind. However, this was not always possible due to the 'busyness' of the midwives role or a birth occurring on the change of shift leaving no time for data entry. In these cases, PD entry was handed over to another midwife or entered some time later. This could be on another shift or another day, by the birthing midwife or someone else. The worst case scenario reported was when the discharge midwife went to enter the small amount of required discharge information and then check and validate the record to find there was no record created and therefore no data entered for the mother or baby at all. In these cases, transcribing data from the written chart was undertaken and midwives voiced concern over relying on the accuracy of the written record.

> *I: "And do you think the paper records are accurate?*
> *P: Probably not. Often they're not. I've done documentation audits and there's either things missing or... I find the same thing going through the paper record to complete the perinatal data. You know I've found records where I can't find documentation of the apgars anywhere in the mother's or baby's notes, or a birth weight or something. So one would assume other things were missing that you're not necessarily looking for."*

Another participant reported looking up information in sources other than the relevant paper records.

> *"I always go in, I do always check the lady's blood group. I don't just take it as a given, what's written in the handheld record in case something has been transcribed incorrectly."*

Participants were concerned about the accuracy of data in written patient records that they are sourcing for entry into the computer for PD collection.

2.1.2. Data standards

2.1.2.1. Obstetric record standards

Participants reported that there is no standard for obstetric data collected via private medical consultations. Therefore the data sourced from the private medical record can be missing altogether, does not match the field definitions of PD or is misrepresented. An example of the misrepresentation of data is the number of ultrasound scans (USSs) which may be recorded to include only the mandatory clinical ones at 12 and 18 weeks. Participants reported that when they questioned the mother further about the number of USSs performed, the obstetrician has used the scanner to determine the foetal position and foetal heart rate at every visit. The data thus is a misrepresentation of the actual number of times the mother and the developing foetus is exposed to ultrasound. This may also relate to obstetricians interpreting USSs to include only those for morphology purposes, clinical USSs looking specifically for congenital abnormalities.

Participants reported that some midwives have limited understanding of the nuances of the various software systems in use in Queensland for entry of PD. An example was that midwives did not know that drop down boxes have scroll bars providing multiple item selections. This would indicate midwives have a lack of computer skill and that the data selected is not always reflective of the appropriate category and either another category is chosen or the information is left out.

"I actually had to teach someone about the drop downs the other day. About BGL's and BSL's. They didn't know there was a drop down box (for pregnancy diabetes) and that was only self discovery."

When the user does not know to scroll down a box to select an appropriate option, data goes unrecorded which directly affects the collection of statistics relating to women and/or the neonate.

2.1.2.2. Computer system standards

Field definitions, the question relating to a field within PD for which information is entered, are reported as having multiple understandings across jurisdictions. Where one unit may define midwife led care as birthing with a midwife who has met the woman at an antenatal visit prior, another defines it as requiring a minimum of 4 or 5 visits with that midwife in a 'know your own midwife' scheme. Inconsistencies were apparent across the various systems and across many fields within each PD system used. In some systems, the field definitions written into the software for data extraction to Queensland Health did not exactly match the field definition required by Queensland Health. Therefore the data extracted for that field is consistently incorrect and returned for correction or clarification to the PD coordinator. These system inconsistencies increase the workload of error correction and clarification as well as potentially collect mismatched data between health care institutions.

3. Discussion

Obstetric and midwifery practice today is primarily evidence based utilising data from sources such as the PD collection in an effort to improve health outcomes and planning for future health service delivery needs [10]. The findings show that generally midwives are concerned about the accuracy of data in the PD entries they complete using a computer. This was reinforced by communication of a clear understanding of the validation process by participants and knowledge that data entered could be successfully validated yet not match the written record. The concerns of participants persist despite perceived improvements in completion of fields and error return rates that moving to an eHealth platform for PD collection has brought. Other Australian research comparing electronic discharge summaries to written versions found that moving to computers does not always improve the data quality, supporting this assertion [11].

A lack of standard data in written sources used for transcription and the use of different computer systems for PD collection potentially reduces the accuracy of data even when the midwife is committed to completing the record accurately and in a timely fashion. The necessity of a PD coordinator, which is both a solution and a recognition of a problem, to correct errors and complete entries prior to validation and extraction of data to Queensland Health, arises as a result of these inconsistencies within data standards of field definition consistency, written records and the computer.

The consequences of inaccurate PD entries are potentially enormous with inaccurate data directly affecting the areas serviced by the very data being collected. Assumption that the PD collection is of high quality when potentially flawed data is known to be entered leads to the risk of this same data being used to make major decisions in the evaluation and future planning for maternity services. Such misinformation puts the health of mother's and babies at risk.

4. Limitations

This research is not without limitation as this study utilised a small purposive sample and use of a methodology that prevents results being generalisable to the midwife population at large or to other computer systems for population data collection. Further research to test the findings with a large population using quantitative methods would strengthen these results.

5. Conclusion and recommendations

Midwives are concerned about the accuracy of the PD they enter for women in their care and believe the data they enter into each field in response to each question is correct. Issues of inaccuracy within the PD collection place at risk the planning of health services in Queensland across all jurisdictions that rely on accurate information and statistics and as a result, the potential health of women and their babies utilising these services. The move from paper to eHealth collection of PD is perceived by midwives to have resulted in a more robust data collection than was previously experienced using paper forms. However, validations alone cannot ensure the data collected by midwives matches that in the written record. A lack of data standards for written records, inconsistent field definitions across computer systems and the persistence of inaccuracies in complete and validated records identify areas for improvement to ensure the data quality of the PD collection is paramount.

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