

Author's response to reviews

Title: Using theories of behaviour to understand transfusion prescribing in three clinical contexts in two countries: Development work for an implementation trial

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Author's response to reviews: see over

24 July 2009

Dear Professor Foy

RE: MS: 5207440632533263 – Using theories of behaviour to understand transfusion prescribing in three clinical contexts in two countries: Development work for an implementation trial.

Thank you for your invitation to revise this manuscript and for the very helpful comments on your two reviewers. While positive about the manuscript in general, both reviewers have raised issues that we are pleased to address and we think this will enhance the quality of the manuscript.

We have listed below the comments of each reviewer, our response to each point, and the page number of the relevant changes in the revised manuscript.

We hope that these changes adequately address the reviewers' concerns and look forward to your decision in due course.

Kind regards

Jill Francis and Alan Tinmouth, for the Author Group

Reviewer 1

1. Page 8, Clinical contexts – please clarify what is meant by 'can be heavily exposed to blood...'

We have clarified this on Page 8:

... neonates represent a clinical group in which patients can be heavily exposed to blood and blood components (i.e., over 90% of extremely low birth term infants are treated with blood products)[23].

2. Page 8, Clinical contexts – it would be useful to know what the findings were of the PlaNeT study mentioned here.

We now describe the PlaNeT study findings on Page 8:

In the UK, the PlaNeT study [25], a prospective cohort of over 150 enrolled severely thrombocytopenic neonates and 300 platelet transfusions administered to nearly 100 neonates at seven different NICUs in Southern and Eastern England, demonstrated that most transfused neonates are preterm but they only require short term platelet transfusions for prophylaxis.

3. Page 8, Clinical contexts – please explain why orthopaedic surgery is one of the largest users of red blood cells – is this simply a function of the volume of such surgical procedures?

We have provided an explanation on Page 8:

Orthopaedic surgery remains one of the largest users of red blood cells as hip and knee replacement surgeries are relatively common procedures which have a high risk of anaemia.

4. Page 8, Clinical contexts – please be explicit about what your target groups are here – the reader has to work this out for themselves.

Thank you for pointing this out. We have given an explicit description of target groups at the start of this section on Page 8:

The target patient groups for this investigation are patients in Intensive Care Units, patients in Neonatal Intensive Care Units and orthopaedic patients (e.g. undergoing surgery for hip fracture).

5. Page 10. Is there any existing evidence of barriers and levers to the transfusion behaviour in question?

We have added a sentence to cover this on Page 9:

The clinical evidence base to support more restrictive transfusion practice is fairly new and, to our knowledge, there have been no investigations of the factors that might hinder or facilitate change in clinicians' transfusion behaviour in these clinical contexts.

6. Page 10, Aims and Objectives 3 – it is not clear why neonatal physicians will be studied in the UK and orthopaedic surgeons in Canada - please explain.

We now provide an explanation on Page 10:

To provide an opportunity to make cross-country comparisons while investigating a broad range of clinical contexts, we decided to design parallel studies in two clinical contexts in each country (Canada and the UK) and to select one clinical context (Adult Intensive Care) for investigation in both countries.

7. Page 10, Methods, Clinical setting – please refer to the findings of the ATTICs study.

Thank you. We felt that it would also be helpful to mention the findings of the ISOC study in this context - now described on Page 10:

In the UK, there is an evolving network of critical care physicians across Scotland, Wales, Northern Ireland and England, who have supported the ATTICs study (which demonstrated a narrowing but persistent gap in clinical practice and the evidence for red cell transfusions in critical care patients) [29-31] in Scotland and the Intensive Care Study of Coagulopathy (ISOC) (which described the current practice of frozen plasma transfusions in critical care patients [32]) in all four countries.

8. Page 11, Interview study -Explain exactly what is meant by 'watching and waiting' and what the guidance is on this.

We have clarified this on Page 10:

The linguistic problem of double negatives makes it quite difficult to conduct interviews about 'not transfusing'. Preliminary discussions with consultants in the chosen contexts established that the alternative to transfusing is continued monitoring of the patient, or 'watching and waiting'.

9. Page 11, Interview study – The strategy of matching beliefs to constructs, rather than domains, and then agreeing on the theoretical models that represent these constructs might be problematic. The authors need to discuss what will happen if the constructs are not adequately encapsulated in one of more existing theoretical frameworks. This also has implications for the questionnaire content.

Thank you for raising this point. We will first match beliefs to domains (in the process of identifying relevant domains) and then to the constructs within those domains. As the constructs within the domains framework are from existing theories we expected that relevant domains would likely be adequately represented by theories. We have added a clause and a paragraph to clarify this on Page 11:

In Stage 1, we will identify all domains in which clinicians report a wide range of beliefs or in which clinicians report create problems...

and

If the identified constructs represent part of a theory, and are not represented in other identified theories, then the entire theory will be included for operationalising in the questionnaire study.

10. Page 12, Questionnaire content – it is not clear how the theoretical framework has helped you identify a parsimonious set of constructs. You start with a confusing array of theories and there is a risk that this may be where you end up– although with a somewhat smaller set of theories perhaps.

Again, this point is an important part of this method and we have taken the liberty of addressing this at some length in the Discussion on Page 14:

The broad objective of this approach is to develop an evidence base for selecting theories that are relevant to a particular clinical behaviour in a specific context and that are thus likely to inform the design of studies seeking to predict or change those behaviours. Although this is likely to minimise the use of researchers' 'favourite' theories (whether or not they are relevant), there are potential pitfalls of this approach. First, if many theories are potentially relevant, then studies based on them are likely to become unwieldy and to lack the parsimony that is scientifically and pragmatically desirable. Second, the efficiencies gained by using the most relevant theories may be lost in the time and resources taken to conduct the kind of interview study proposed here. Nevertheless, we feel it is worth considering whether a systematic method for selecting theories is preferable to the use of favourite theories, or hunches about what might be relevant.

11. Page 13, Analysis of sample size – is 50% response conservative? My experience of surveys with health professionals is that 30% is more realistic. Please provide further information about how you plan to maximise your response rate - perhaps refer to Edwards et al., review article in BMJ 2002;324;1183. Does 150 respondents for both surveys equate to 75 in the neonatal surgeon and orthopaedic surgeon groups and, if so, are these numbers sufficient.

We have deleted the word 'conservative' and have clarified sample sizes and plans for maximising response rates on Page 13:

We will aim to achieve 150 respondents for each of the two surveys in each country (i.e. 600 respondents in all).

and

To maximise the response rate, a customised letter inviting consultants to participate will be signed by a clinical member of the research team who is well-known within each clinical specialty. As the consultant groups in each of the countries are close-knit professional bodies, we expect a high level of support for this work and thus reasonably high response rates.

12. Page 13 - please explain what statistical analysis will be used to perform the international comparisons.

We have clarified this on Page 13:

We will use multivariate analysis of variance to compare mean scores on each construct (e.g. to identify any differences between national or clinical context in intention) and multiple regression approaches to identify whether national or clinical context adds to the prediction of intention and simulated behaviour.

13. The discussion deviates somewhat from the original aims set out on page 10 and it may not be clear to some readers why attention has suddenly turned to the intention-behaviour gap. The authors need to be explicit in making the links between their study and the psychological theory that underpins it.

A very helpful observation – thank you. We have provided better mapping between the objectives and discussion on Page 14:

Conducting semi-structured interviews (based on the theoretical domains framework) to identify theoretical constructs (and therefore psychological theories) is an approach that has rarely been used before, and to our knowledge has not been used with respect to transfusion practice.

and

The questionnaire study will identify the psychological constructs that predict the decision by clinicians to transfuse red blood cells (as opposed to continuing to monitor the patient). Identifying the predictors of generalised intention about transfusing (or not) and simulated behaviour (i.e. the decision whether or not to transfuse given a specific clinical scenario) will inform the development of interventions to increase evidence-based behaviour in these clinical contexts. It is therefore important to identify whether the prediction of intention is an appropriate basis for interventions to change actual behaviour.

Reviewer 2

1. It is presumably submitted to be considered in the Implementation Science journal category of "Study protocols" rather than "Methodology".

Thank you. We have submitted this revision as a protocol.

2. Abstract, methods section:

"Using a previously identified framework we will conduct semi-structured interviews with clinicians to elicit their views about which factors are associated with monitoring rather than transfusing red blood cells." A minor rewording of this sentence may be helpful – as it stands it could be interpreted that the study is investigating clinicians' views either on transfusion prescribing practice or on transfusion administration practice – where "monitoring" could be read as the set of observations taken during administration of a transfusion, rather than the continued close observation of a patient where a decision has been made not to prescribe a transfusion.

Thank you. We have clarified this in the Abstract as:

...waiting and further monitoring the patient

3. The introduction is quite lengthy, but since it is likely that many readers of this journal will not have great familiarity with some details of transfusion practice, the inclusion of background information under the headings of "Blood transfusion", "Changing transfusion practice", "Clinical contexts" seems reasonable to set the scene.

Thank you. Nevertheless we have shortened some sections of the introduction (Point 5 below).

4. The authors include examples from relevant publications showing variation in transfusion practice to illustrate the rationale for this study. Whether the main predictors of this variation are individual (or group) clinician behaviour, or some other factor (e.g. the paucity of solid evidence on which clinicians can base their decisions, or the content of availability of institutional or jurisdictional protocols or guidelines), is less clear.

Thank you for making this important point, which we think may be shared by some readers. The theoretical domains framework covers these possibilities and we have clarified the possible predictors and their relationship to our methods on Pages 6-7:

A range of factors (e.g. patient preference, paucity of solid evidence on which clinicians can base their decisions, or the content or availability of institutional or jurisdictional protocols or guidelines) may influence transfusion practice and interventions to change clinical practice can be aimed at a number of levels (individual health care professionals; health care groups or teams; organisations providing health care; the larger health care system; or environment). While the majority of interventions have been aimed at individual practitioners, the study described in this protocol will be based on a broad theoretical framework that includes potential predictors from models of individual, team-level and organisational behaviour. Nevertheless, the outcome to be predicted will be the behavioural intention and simulated behaviour (specific clinical decisions) of individual clinicians, as ultimately it is the individual clinician who decides much of the face-to-face health care.

5. Perhaps the sections headed "Implementation Research" and "The use of behavioural theory....." may be able to be shortened a little, for this readership?

We agree, and have reduced these sections (Pages 6 and 7) and the corresponding references.

6. "There is recognition that the findings from clinical and health services research will not change population health outcomes unless health care systems, organizations and professionals adopt them in practice[12]." Would it be worth including a phrase here and/or reference to the issue of patient/consumer/community participation (or lack of) in changing practice and leading to changes in outcomes? Some changes in practice have been heavily influenced by patient or other groups advocating for changes based on clinical research findings. While this patient advocacy aspect is not the main focus of the study being described in this paper, it may be relevant to acknowledged it here briefly, because clinicians' transfusion decisions are not influenced only by their own circumstanced and beliefs, but should take into account the patients' individual circumstances, including their beliefs and wishes. The issue of truly informed consent for transfusion is a complex one and often managed very poorly.

This is again an important point. Our theoretical framework would place patients' beliefs and wishes as a potential influence on clinical behaviour rather than the object of study ie an outcome. We have included patient preference in the list of potential levels of predictors on Page 6 (see text under Point 4 above).

8. While the section on the roles of NHSBT and Canadian Blood Services is interesting and may be helpful to readers not familiar with the field of transfusion, it may be worth considering whether this information is really necessary to understand the protocol described in this manuscript.

We understand the point but feel that it is good practice to describe some aspects of the context of the study. However, we have reduced these sections considerably (Pages 8-9).

9. It might be helpful to the readers of this paper if the authors gave some information about how the participating clinicians will be identified and selected, especially for the interview stage. On reading this section I wondered several times whether the clinicians who might agree to participate in either the interview or survey would really be representative of ICU and NICU physicians generally, and how the investigators would know whether they were representative (or not). For example, would those who agreed to participate be more likely to be physicians not just with a generally heightened awareness of transfusion issues but perhaps also those whose own practice has already changed to incorporate some of the recent data?

We agree that the issue of representativeness requires some explanation and thank the reviewer for pointing out our omission of a description of sampling procedures. We have provided this on Pages 10 and 12:

Although convenience sampling will be used, participants will also be selected in such a way as to ensure diversity of age, gender and hospital size so as to maximise the range of views expressed. Although the sample will thus not necessarily be representative, we will nevertheless identify a wide range of views for consideration in the design of the questionnaire.

and

Sampling procedure

With permission from the relevant professional societies, we will select a random sample of names from lists of practising consultants in each country.

10. Page 12: "Questionnaire content" section, minor typographical change: "amenable to change".

Thank you. Done (Page 12)

11. Does the study include consideration of "non-volitional components" such as availability of, and content of, institutional transfusion policies, in addition to the "guidelines" question?

Yes, the theoretical domains framework includes these types of non-volitional components. We have tried to make this clearer on Page 8:

They include 'non-volitional' factors such as local protocols, management policies and resources available in the local context.