

PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form ([see an example](#)) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below. Some articles will have been accepted based in part or entirely on reviews undertaken for other BMJ Group journals. These will be reproduced where possible.

ARTICLE DETAILS

TITLE (PROVISIONAL)	AN OBSERVATIONAL STUDY TO IDENTIFY ORGANIZATIONAL PROCESSES ASSOCIATED WITH NURSE-REPORTED QUALITY AND PATIENT SAFETY
AUTHORS	Tvedt, Christine; Sjetne, Ingeborg; Helgeland, Jon; Bukholm, Geir

VERSION 1 - REVIEW

REVIEWER	Diane Doran, RN, PhD, FCAHS Professor Lawrence S. Bloomberg Faculty of Nursing University of Toronto
REVIEW RETURNED	02-Sep-2012

THE STUDY	<p>There are threats to internal validity, which the authors acknowledge, such as common method variance. A much stronger methodology would incorporate objective measures of quality and safety outcomes, and employ a longitudinal design to provide stronger inference about associations among study variables. More information needs to be provided about the accuracy of data obtained from public registers. How reliable are the data about structural characteristics of hospitals and was any attempt made to validate the data? Some of the variables are not adequately explained such as nurse patient ratio and physician-patient ratio. Was this an average across all types of programs, both inpatient and outpatient? What specifically is index for patient mix? It would also be helpful to have data on the representativeness of the nurse sample to the general population of nurses in Norway in order to inform the external validity of the study. The average age seems young compared to what I am familiar with. The investigators aggregated data on organizational process measures to the hospital level. They should report the intra-class correlation coefficient. None of the tables have sample size reported. Are we to infer there were no missing cases for any variables or were missing values imputed? It would be helpful to clearly identify which variables in table 3 represent the Lake set of variables and which are from the current study.</p>
RESULTS & CONCLUSIONS	The discussion is appropriate but would be stronger if it included more reference to current literature

REVIEWER	Greta G. Cummings RN PhD FCAHS Principal, CLEAR Outcomes (Connecting Leadership Education & Research) Research Program Population Health Investigator Alberta Heritage Foundation for Medical Research Professor, Faculty of Nursing, University of Alberta
-----------------	--

	No conflicts
REVIEW RETURNED	15-Sep-2012

THE STUDY	<p>This manuscript has some potential to make a contribution to the patient safety literature however requires major revisions before being ready for consideration for publication.</p> <p>Abstract – the objectives section is not written as objectives. It should be revised to more clearly identify the purpose of the study and the specific objectives. Additional detail about sample size etc should be added to the methods. The conclusions are not clear and grammatical issues throughout may it difficult to understand exactly what the authors are intending. For example, "... there is a considerable potential to address organizational design to improve of nurses' assessments of patient safety" does not tell the reader if the authors are recommending that organisational designs could or should be changed (and how this would be done), and whether nurses' "ability to assess patient safety" or their actual assessment scores?</p> <p>Manuscript – the confusion about the actual purpose and objectives is evident here as well. The purpose type statement indicates that the authors study "how nurses assess organizational features and relate them to patient safety and quality of nursing". This is somewhat different than the abstract, and does not delineate what aspects of nursing (care, outcomes?, performance?).</p> <p>Literature – the literature review is very cursory and should be expanded to address more of the current safety literature including that which discusses the relationships between organizational characteristics, nurse reported outcomes and patient safety. The literature on patient safety cultures is also considerable and should be summarized as it relates to the researcher's operationalization of patient safety.</p> <p>Donabedian's SPO framework is discussed in the literature review; however, the Structure, Process and Outcomes dimensions should be described in more detail and related to the concepts and measures of interest in this study. It is not clear if and how this model was used to guide the study design. Given the cross-sectional survey design, this analysis is limited by potential common method bias. It is important to identify potential relationships to be examined through the development of a priori hypotheses or research questions, and the efforts to mitigate common methods bias should be reported.</p> <p>Methods – The data collection procedures could be expanded somewhat. For example, it is not clear why Dillman-type methods were not used to send reminders.</p> <p>Measures – the rationale for using single items should be justified. Additionally the source of all measures must be reported along with reliability and validity information. The PES-NWI is not referenced (Lake et al). Despite reports of use, there is controversy about its use as measure of the nursing work environment (See Cummings et al, 2006 Nursing Research). If items were recoded, it should be noted (the NWI data are usually collected using a 4 point Likert scale of Strongly Agree=1 to strongly disagree =4, therefore requiring recoding).</p> <p>Page 7 - What is the meaning of a composite score for the adverse events listed in Figure 1? Scale means? Added as a count variable?</p> <p>Page 8 – how were the PES-NWI subscales and HSOPSC defined as organizational process measures – this needs to be justified. Similarly, the "theoretical considerations" related to the organizational structures measures need to be explained.</p>
------------------	--

	The statistical analyses should also be justified. It is not clear why factor analysis was chosen. Given the number of hospitals and nurses in this study, the analyses could potentially be strengthened by testing hypotheses using a multilevel model. This would require aggregation of data to the care unit level. It would require ICC assessment however the literature has shown that culture and other organizational characteristics are unit or facility level characteristics and therefore should not be analyzed unadjusted across multiple facilities.
RESULTS & CONCLUSIONS	Results –The relationships may be influenced by many other factors and without an analysis that controls for these, the relationships reported in the results are not as meaningful as if they based on a priori hypotheses as indicated earlier. Discussion – a considerable portion of the discussion repeats the results. The discussion would have to be reformulated once the rest of the manuscript has been revised.

VERSION 1 – AUTHOR RESPONSE

Reviewer Diane Doran

D1 More information needs to be provided about the accuracy of data obtained from public registers. How reliable are the data about structural characteristics of hospitals and was any attempt made to validate the data? Some of the variables are not adequately explained such as nurse patient ratio and physician-patient ratio. Was this an average across all types of programs, both inpatient and outpatient? What specifically is index for patient mix?

Commented in discussion (page 20). Specified in methods page 11 and 12

D2 It would also be helpful to have data on the representativeness of the nurse sample to the general population of nurses in Norway in order to inform the external validity of the study. The average age seems young compared to what I am familiar with.

Commented in methods page 14 and discussion page 19

D4 The investigators aggregated data on organizational process measures to the hospital level. They should report the intra-class correlation coefficient. None of the tables have sample size reported. Sample size is included in tables, and organisational process measures are analysed at individual level.

See page 15, table 3

D5 Are we to infer there were no missing cases for any variables or were missing values imputed? It would be helpful to clearly identify which variables in table 3 represent the Lake set of variables and which are from the current study.

Methods page 10. See online-figure number 2

Reviewer: Greta G. Cummings

C1 Abstract – the objectives section is not written as objectives. It should be revised to more clearly identify the purpose of the study and the specific objectives.

See abstract page 2

C2 Additional detail about sample size etc should be added to the methods.

See abstract page 2

C3 The conclusions are not clear and grammatical issues throughout may it difficult to understand exactly what the authors are intending. For example, "... there is a considerable potential to address organizational design to improve of nurses' assessments of patient safety" does not tell the reader if

the authors are recommending that organisational designs could or should be changed (and how this would be done), and whether nurses' "ability to assess patient safety" or their actual assessment scores?

See abstract page 2

C4 Manuscript - the confusion about the actual purpose and objectives is evident here as well. The purpose type statement indicates that the authors study "how nurses assess organizational features and relate them to patient safety and quality of nursing". This is somewhat different than the abstract, and does not delineate what aspects of nursing (care, outcomes?, performance?).

See objectives page 6

C5 Literature – the literature review is very cursory and should be expanded to address more of the current safety literature including that which discusses the relationships between organizational characteristics, nurse reported outcomes and patient safety. The literature on patient safety cultures is also considerable and should be summarized as it relates to the researcher's operationalization of patient safety.

We have rewritten the introduction page 4 to respond to this

C6 Donabedian's SPO framework is discussed in the literature review; however, the Structure, Process and Outcomes dimensions should be described in more detail and related to the concepts and measures of interest in this study. It is not clear if and how this model was used to guide the study design. Given the cross-sectional survey design, this analysis is limited by potential common method bias. It is important to identify potential relationships to be examined through the development of a priori hypotheses or research questions, and the efforts to mitigate common methods bias should be reported.

We have rewritten the introduction page 4 to respond to this

Commented in discussion page 19

C7 Methods – The data collection procedures could be expanded somewhat. For example, it is not clear why Dillman-type methods were not used to send reminders.

Commented in methods page 7

C8 Measures – the rationale for using single items should be justified. Additionally the source of all measures must be reported along with reliability and validity information. The PES-NWI is not referenced (Lake et al). Despite reports of use, there is controversy about its use as measure of the nursing work environment (See Cummings et al, 2006 Nursing Research). If items were recoded, it should be noted (the NWI data are usually collected using a 4 point Likert scale of Strongly Agree=1 to strongly disagree =4, therefore requiring recoding. Commented in methods page 8. Reference to PES-NWI is corrected. We believe comments are responded to by rewriting methods

C9 Page 7 - What is the meaning of a composite score for the adverse events listed in Figure 1? Scale means? Added as a count variable?

See methods page 9

C10 Page 8 – how were the PES-NWI subscales and HSOPSC defined as organizational process measures – this needs to be justified. Similarly, the "theoretical considerations" related to the organizational structures measures need to be explained.

We believe comments are responded to by rewriting introduction, objectives and methods

C11 The statistical analyses should also be justified. It is not clear why factor analysis was chosen. Given the number of hospitals and nurses in this study, the analyses could potentially be strengthened by testing hypotheses using a multilevel model. This would require aggregation of data to the care unit level. It would require ICC assessment however the literature has shown that culture

and other organizational characteristics are unit or facility level characteristics and therefore should not be analyzed unadjusted across multiple facilities.

We have included hospital ward and hospital in the model. See Statistical analysis and results

C12 Results –The relationships may be influenced by many other factors and without an analysis that controls for these, the relationships reported in the results are not as meaningful as if they based on a priori hypotheses as indicated earlier.

We have specified statistical methods and results to respond to these issues. The general rewriting should make this clearer

C13 Discussion – a considerable portion of the discussion repeats the results. The discussion would have to be reformulated once the rest of the manuscript has been revised.

Major changes in the discussion have been made as a consequence of the revisions of other parts of the manuscript

VERSION 2 – REVIEW

REVIEWER	Diane Doran, RN,PHD, FCAHS Professor Lawrence S. Bloomberg Faculty of Nursing University of Toronto
REVIEW RETURNED	04-Nov-2012

THE STUDY	<p>1. Overall the research questions are clearly defined. However there is one assertion noted in the abstract as well as page 5 of the manuscript that is not clearly justified - the authors assert that health care workers' perceptions related to patient safety vary by discipline. Is there evidence to support this assertion? In the context of interdisciplinary practice, why would we expect variation in perception of organizational processes and outcomes among health disciplines? I can imagine differences could be related to professional expectations or professional sub-cultures but this is not explained in the paper but seems to be one of the major premises for conducting the research.</p> <p>2. Another rationale for the study stated on page 5 is “information about how health care workers take advantage of processes and structures in the organization is essential for design of patient safe health care organizations”. However I do not believe the paper actually addresses how nurses take advantage of processes and structures in the organization. Perhaps this notion should either be revised or developed further in the discussion under study implications.</p> <p>3. Page 6, the authors indicate nurse-reported quality of nursing and patient safety were nested – perhaps expand to indicated nested in hospital and unit type?</p> <p>4. The clarity of the methods has been greatly improved in this revision. The authors might want to include for online only, the ICCs and DEs (design effect) (if possible). They reference them on page 20 of the discussion but do not seem to report them.</p>
RESULTS & CONCLUSIONS	<p>Overall the paper is clearly written and the results are well presented. There are still editorial corrections.</p> <ol style="list-style-type: none"> 1. Extra or missing periods on pages 5, 9, 11, 17, 18. 2. Spelling error page 8 (where instead of were); page 9 administrations instead of administrators; 3. page 11, remove "in the" second last line of second paragraph. 4. Page 33, missing period in mean age of nurses. 5. Page 13 - space needed before bracket (table 5).

	<p>6. Page 15 add "at" to sentence starting with "Nurses working a local".</p> <p>7. In the discussion the authors note "the study makes a contribution to knowledge about how interventions should be targeted towards nurses as one major micro system of the organization". I am not sure this conclusion is warranted. I believe it would be more appropriate to say the study makes a contribution to knowledge about how interventions should be targeted towards organizational processes..."</p>
--	--

VERSION 2 – AUTHOR RESPONSE

We have changed the manuscript according to the good advice from the reviewer. In addition we have made some minor changes to make the language more fluent and to clarify the meaning of some sentences.