PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Video recording as an objective assessment tool of health worker performance in neonatal resuscitation at a district hospital in Pemba, Tanzania: a feasibility study
AUTHORS	Holm-Hansen, Charlotte; Poulsen, Anja; Skytte, Tine; Stensgaard, Christina Nadia; Bech, Christine; Lopes, Mads; Kristiansen, Mads; Kjærgaard, Jesper; Mzee, Said; Ali, Said; Ame, Shaali; Sorensen, Jette Led; Greisen, Gorm; Lund, Stine

VERSION 1 – REVIEW

REVIEWER	Briggs, Datonye Rivers State University of Science and Technology
REVIEW RETURNED	14-Mar-2022

GENERAL COMMENTS	Very original and well thought out research aimed at assessing the feasibility of using video recording of NR sessions as an assessment tool for health workers performing NR real-time in resource limited settings. It indeed would be appreciated if a larger study is conducted among secondary and even primary healthcare settings to highlight key deficits among attending health workers. This would strengthen the evidence for training and retraining with emphasis on the identified areas of weaknesses. The study Limitations were aptly presented. However, a few typographical and punctuation errors were observed. For instance, some in-text citations have the punctuation after and at other places before the reference numbers - e.g. page 9, line 55, page 10 lines 46, 58, Page 11 lines 6, 46, page 12 lines 8,9,44,53, Page 13 line 11, full stop is omitted, lines 15, 18, 27 etc. (Kindly cross check that author's guidelines are followed strictly). Page 7, line 20....should read.."An analytical.... " and not a analytical... It is also suggested that the Bowen's feasibility study framework be briefly described in the introduction to enable readers appreciate its usefulness and significance as the their preferred framework to be used in assessing feasibility for this study.

REVIEWER	Rouvinez-Bouali, Nicole Children's Hospital of Eastern Ontario
REVIEW RETURNED	16-Mar-2022

GENERAL COMMENTS	bmjopen-2021-060642 / Comments to the author: The topic is relevant and methodology with videorecording allows for objective evaluation of first respondents' practice.

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	Congratulations to the research team for a well done research despite challenging local conditions and showing its feasibility. I strongly support publication of this research for the following reason: HBB has highly contributed to the advancement of neonatal resuscitation in underprivileged regions of the world, and to the promotion of reusable and affordable resuscitation equipment. Nevertheless, despite many international campaigns and national programs implemented, there remains extended use of poor resuscitation practices, that are rightfully reported by the authors, and that I have witnessed repeatedly in Sub-Saharan Africa. There is also a bias towards reporting the benefits and successful implementations of the HBB program more than the failures of neonatal resuscitation in low and middle income countries (LMIC). As specified by the authors, there is an urgent need for strategies to improve neonatal resuscitation in LMIC. The low cost and relative simplicity of the technique used for video-recording in this study has the potential to facilitate the reproducibility and expansion of the research to other LICs settings and could be implemented as an ongoing quality improvement and education tool in various low-resource settings. Methods: - The aim of the study is well stated, but there is no pre-specified hypothesis. - The Bowen feasibility study framework is appropriate to answer the research question. - The setting is well described and corresponds to a low-intermediate resource setting. The authors could precise better which neonatal resuscitation guideline is used locally: is it HBB, WHO or another resuscitation guideline? Or is there no officially recommended guideline locally, which could contribute to explain deviance from the generally accepted guidelines. - Population, inclusion/exclusion criteria: patient' consent process and enrollment limits are well specified. There is no explicit exclusion criteria described in the methodology. Exclusion based on lack of consent and delivery or C/S happening prior to consent being obtained is implicit from the enrollment limits. Was there any exclusion based on language barrier? Also, the authors could have specified that the video-recordings would be excluded from the quality of resuscitation assessment (table 6) if bag and mask ventilation was not required, as apparent from the flowchart (Fig 1). Given the neonatal mortality rate of 16/1000 LB and stillbirth rate of 29/1000 births, I am surprised that only one death was recorded on video (for a very low birthweight infant) – was stillirth an exclusion criteria? -Consent and feasibility: I am surprised that the videorecording was accepted so easily by the teams and families. This may denote prior interventions of the research team hospital in the study setting (?) that could favor trust from the team, but could limit reproducibility of the research. The research team could specify if any incentive or authority measures were applied to promote consent. - Data source and management equipment: as explained by the authors, the motion-triggered video-recording allows for minimal interference with the usual healthcare worker newborn resuscitation measures. - It seems that all babies are moved to the resuscitation table, even if they do not require resuscitation, which does not correspond to the HBB guideline. Is this the usual local

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	management, or was it required by the study to allow video-recording of all consented resuscitations? In which case the change from leaving the baby with mom to that of clamping the cord early to move baby to the table could have contributed to some of the lack of adherence to the resuscitation timeline and procedure efficiency? If babies are supposed to remain with mom to allow delayed cord clamping, better temperature control and early breastfeeding such as advocated in HBB, the authors could add the non-compliance to these recommendations in the list of resuscitation measures assessed, given that 73%of babies did not need resuscitation but were still taken to the resuscitation table (Table 6). - Participant data protection measures are well described and correspond to usual process and REB requirements of research done in high resource countries. - Outcomes and variable / Data analysis / independence from funding sources: no issues. Results: The reported results confirm that first line responders (midwives, nurses, doctors) continue to provide inappropriate resuscitation measures, such as insufficient temperature control, inadequate stimulation, prolonged deep suctionning and omission or incorrectly executed/delayed bag and mask ventilation (B&M). The report of included/excluded women is clear in the flowchart (Fig1), but not as clear in the text, please clarify in the text. Only 101 videos were recorded when 139 women had consented – is the difference all due to babies being resuscitated on the same table as a babies where mom did not give consent? Or is there any other explanation? Please clarify in the text and in the flowchart (Fig1). Also please clarify the 2 babies who did require B&M ventilation but were not filmed as exclusions in the flowchart. No issues with the feasibility report in the text or table Discussion: well done, no issues. Figures and tables: - See comments above for Fig1 (flowchart) edits - Table 3: participating HCW: p 24 lines 9-18: if I understand well, this is the number of deliveries “done by individual HCW” in the last month prior to the study? May need to rephrase to clarify for better understanding - Table 6: please improve the way section titles (ex: heat loss prevention, positioning of head, cleaing of airway….B&M ventilation) appears as it would improve the readability of the table. Also highlight the section on B&M ventilation as this is the single most important HBB/NR intervention to restore vital signs in a depressed newborn. Many thanks for the opportunity to review your work!

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VERSION 1 – AUTHOR RESPONSE

Reviewer: 1
Dr. Datonye Briggs, Rivers State University of Science and Technology

Comments to the Author:
Very original and well thought out research aimed at assessing the feasibility of using video recording of NR sessions as an assessment tool for health workers performing NR real-time in resource limited settings. It indeed would be appreciated if a larger study is conducted among secondary and even primary healthcare settings to highlight key deficits among attending health workers. This would strengthen the evidence for training and retraining with emphasis on the identified areas of weaknesses.

Dear Dr. Datonye Briggs,

Thank you for the praise of our study. The study was a feasibility study before a pre-post intervention study to pilot test the instruments and the methodology and test if video recordings of neonatal resuscitations were possible in this setting. As we concluded, it was deemed possible even though operational challenging and the methodology was adapted and adopted for the larger-scale study. The more extensive baseline study findings are under final preparations and will provide information on a larger scale from four district hospitals in Pemba over an extended period.

The study Limitations were aptly presented. However, a few typographical and punctuation errors were observed. For instance, some in-text citations have the punctuation after and at other places before the reference numbers - e.g. page 9, line 55, page 10 lines 46, 58, Page 11 lines 6, 46, page 12 lines 8,9,44,53, Page 13 line 11, full stop is omitted, lines 15, 18, 27 etc. (Kindly cross check that author's guidelines are followed strictly).
Page 7, line 20....should read.."An analytical.... " and not a analytical...

Thank you for pointing out that the limitations section is aptly presented, which is much appreciated.

Thank you very much for pointing out these typographical and punctuation errors with in-text citations. We have corrected all of those mentioned above, cross-checked all in-text citations, and corrected any punctuation errors.

It is also suggested that the Bowen's feasibility study framework be briefly described in the introduction to enable readers appreciate its usefulness and significance as the their preferred framework to be used in assessing feasibility for this study.

This is indeed a valuable comment. We have added a short paragraph about Bowen’s feasibility study framework to the ‘Introduction’ section.

Reviewer: 2
Dr. Nicole Rouvinez-Bouali, Children's Hospital of Eastern Ontario

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Comments to the Author:
bmjopen-2021-060642 / Comments to the author:

The topic is relevant and methodology with videorecording allows for objective evaluation of first respondents' practice. Congratulations to the research team for a well done research despite challenging local conditions and showing its feasibility.

I strongly support publication of this research for the following reason: HBB has highly contributed to the advancement of neonatal resuscitation in underprivileged regions of the world, and to the promotion of reusable and affordable resuscitation equipment. Nevertheless, despite many international campaigns and national programs implemented, there remains extended use of poor resuscitation practices, that are rightfully reported by the authors, and that I have witnessed repeatedly in Sub-Saharan Africa. There is also a bias towards reporting the benefits and successful implementations of the HBB program more than the failures of neonatal resuscitation in low and middle income countries (LMIC). As specified by the authors, there is an urgent need for strategies to improve neonatal resuscitation in LMIC. The low cost and relative simplicity of the technique used for video-recording in this study has the potential to facilitate the reproducibility and expansion of the research to other LICs settings and could be implemented as an ongoing quality improvement and education tool in various low-resource settings.

Dear Dr. Nicole Rouvinez-Bouali,

First, thank you very much for supporting this publication and for all your valuable and insightful comments. We appreciate your insights.

Methods: The aim of the study is well stated, but there is no pre-specified hypothesis.

The feasibility study design and Bowen feasibility study framework do not require a pre-specified hypothesis. The Feasibility study provided valuable information in planning our main Newborn Emergency Outcome study with a hypothesis that an intervention with the Safe Delivery Application and a Low-Dose High Frequency training programme could lower perinatal and neonatal mortality.

- The Bowen feasibility study framework is appropriate to answer the research question.

The setting is well described and corresponds to a low-intermediate resource setting. The authors could precise better which neonatal resuscitation guideline is used locally: is it HBB, WHO or another resuscitation guideline? Or is there no officially recommended guideline locally, which could contribute to explain deviance from the generally accepted guidelines.

Thank you for pointing this out. There is a lack of consistency in guidelines, the available guidelines were HBB, WHO guidelines, and the local Ministry of Health guidelines. We have added a paragraph specifying this in the 'Limited-Efficacy testing' section in the 'Results' section.

Population, inclusion/exclusion criteria: patient' consent process and enrollment limits are well specified. There is no explicit exclusion criteria described in the methodology. Exclusion based on lack of consent and delivery or C/S happening prior to consent being obtained is implicit from the enrollment limits. Was there any exclusion based on language barrier? Also, the authors could have specified that the video-recordings would be excluded from the quality of resuscitation assessment (table 6) if bag and mask ventilation was not required, as apparent from the flowchart (Fig 1). Given the neonatal mortality rate of 16/1000 LB and stillbirth rate of 29/1000 births, I am surprised that only one death was recorded on video (for a very low birthweight infant) – was stillirth an exclusion criteria?

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Local research assistants were present 24 hours per day and there was no language barrier in this study. Only videos with an attempt of resuscitation with a bag and mask were included in the analysis. We have added a paragraph specifying this in the 'Data analysis' section.

Consent and feasibility: I am surprised that the videorecording was accepted so easily by the teams and families. This may denote prior interventions of the research team hospital in the study setting (?) that could favor trust from the team, but could limit reproducibility of the research. The research team could specify if any incentive or authority measures were applied to promote consent.

Thank you for this very important comment about the reproducibility of the research. The partners involved in this study indeed have a long standing collaboration but not extending to an individual level of midwifes and health workers involved in this study. The Ministry of Health and local authorities were informed by the local and international PI, junior and senior members of the research team, and various meetings were held before the study to ensure acceptance, participatory commitment, and an equal partnership. We have added a paragraph about this critical topic in the 'Study Population' part of the 'Methods section'.

Data source and management equipment: as explained by the authors, the motion-triggered video-recording allows for minimal interference with the usual healthcare worker newborn resuscitation measures.

Thank you for this comment.

It seems that all babies are moved to the resuscitation table, even if they do not require resuscitation, which does not correspond to the HBB guideline. Is this the usual local management, or was it required by the study to allow video-recording of all consented resuscitations? In which case the change from leaving the baby with mom to that of clamping the cord early to move baby to the table could have contributed to some of the lack of adherence to the resuscitation timeline and procedure efficiency? If babies are supposed to remain with mom to allow delayed cord clamping, better temperature control and early breastfeeding such as advocated in HBB, the authors could add the non-compliance to these recommendations in the list of resuscitation measures assessed, given that 73%of babies did not need resuscitation but were still taken to the resuscitation table (Table 6).

This is a very important comment and learning this from the feasibility study and we are exploring this phenomenon further in our baseline study. The feasibility study aimed to examine resuscitation practice. Analysis of the healthy newborns separated from their mother and placed on the resuscitation table were not within this paper's scope. We are however preparing a paper exploring these secondary findings on Essential Newborn Care practices.

CN Steensgaard, CM Bech, CC Holm-Hansen, TS Pedersen, SM Ali, S Ame, J Kjærgaard, A Poulsen, S
Lund, Essential Newborn Care practices of healthy newborns at a district hospital in Pemba, Tanzania: A
Cross-sectional observational study using video recordings. Manuscript submitted for publication.

Participant data protection measures are well described and correspond to usual process and REB requirements of research done in high resource countries.

Thank you.

Outcomes and variable / Data analysis / independence from funding sources: no issues.

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Results:
The reported results confirm that first line responders (midwives, nurses, doctors) continue to provide inappropriate resuscitation measures, such as insufficient temperature control, inadequate stimulation, prolonged deep suctionning and omission or incorrectly executed/delayed bag and mask ventilation (B&M).

The report of included/excluded women is clear in the flowchart (Fig1), but not as clear in the text, please clarify in the text. Only 101 videos were recorded when 139 women had consented – is the difference all due to babies being resuscitated on the same table as a babies where mom did not give consent? Or is there any other explanation? Please clarify in the text and in the flowchart (Fig1). Also please clarify the 2 babies who did require B&M ventilation but were not filmed as exclusions in the flowchart.

Thank you for pointing this out. The resuscitation table is shared by newborns born by 3-4 mothers sharing the delivery room. If a newborn born from a mother without consent was placed at the resuscitation table, the camera was covered during the whole time, and therefore missed videos of another newborn. In addition, the resuscitation table was sometimes preoccupied with as many newborn that could possibly fit, and resuscitation or essential newborn care was performed elsewhere. We have added a paragraph about in the 'Participating women and health workers section'.

No issues with the feasibility report in the text or table

Discussion: well done, no issues.

Thank you.

Figures and tables:
See comments above for Fig1 (flowchart) edits
Table 3: participating HCW: p 24 lines 9-18: if I understand well, this is the number of deliveries "done by individual HCW" in the last month prior to the study? May need to rephrase to clarify for better understanding

Thank you for this comment, we have rephrased the sentence to be clearer.

Table 6: please improve the way section titles (ex: heat loss prevention, positioning of head, cleaing of airway….B&M ventilation) appears as it would improve the readability of the table. Also highlight the section on B&M ventilation as this is the single most important HBB/NR intervention to restore vital signs in a depressed newborn.

Thank you for your comment, we have reformatted the table and highlighted which interventions are assessed with subheadings.

Many thanks for the opportunity to review your work!

We are very thankful and appreciative of the valuable input from reviewers.

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VERSION 2 – REVIEW

REVIEWER	Rouvinez-Bouali, Nicole Children's Hospital of Eastern Ontario
REVIEW RETURNED	21-Apr-2022

GENERAL COMMENTS	Second review: I am satisfied with the content revision following comments from first revision. There remains minor changes to edit, as below: P4, last line: Analyzed (US) or analyse (British)? (Analysis written with “s” on p8-9 under data analysis). Please use British or US English throughout the document P 5, line 3: utilize (US) or utilize (British)? Same as above P 15, line 4: unnecessarily After these changes are made, I recommend publication of the manuscript.

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