

The growing use of the WHO Safe Childbirth Checklist: Lessons learned at the Yaounde Gyneco-Obstetric and Pediatric Hospital, Cameroon

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Abstract

Background: Safe childbirth remains a daunting challenge, particularly in low-resource settings where most pregnancy-related deaths occur. Cameroon's maternal mortality rate, estimated at 782 per 100,000 live births in 2011 is significantly high. Adherence to good practice standards by birth attendants is key to improving pregnancy outcomes. The WHO Safe Childbirth checklist was designed as a tool to improve the quality of care provided to women giving birth. This checklist was implemented at the Yaounde Gyneco-Obstetric and Pediatric Hospital. Quantitative and qualitative assessment of its utilization is essential to secure a change in attitudes and practice and engender improvement in maternal health. **Objective:** Evaluate the change in attitudes and practice of nurses and compare outcomes in cases where it was and was not used, 6 months after introduction of the safe childbirth checklist in a maternity setting. **Methods:** A cross sectional and retrospective study was conducted over a 6 month period (January – June 2018). Predesigned questionnaires were used to collect qualitative data from personnel of the Gynecology and Obstetrics unit who used the safe childbirth checklist and quantitative data from patient delivery records. Data analysis was done using SPSS version 23.0. Chi square test was used to compare categorical variables, while the student test was used to compare continuous variables. **Results:** Of the 1001 files retrieved from the archives, 25 were excluded. The checklist was used in 828/976 (84.8%) files. We observed an increasing trend in the usage rate, with a peak at 93.9% recorded during the last 2 months. Pages 2 and 3 were least completed, in <10% of cases during the first 5 months. A significant reduction in the onset of pre-eclampsia and eclampsia was noted with the use of the checklist (2.1% Vs 5.4%, $p = 0.017$). Fifty percent of the staff reported that the checklist increased workload while 37.5% mentioned laziness and absence of checklists in some files as a hindrance to its proper use. **Conclusion:** The use of the safe childbirth checklist improved progressively with a simultaneous reduction in obstetrical and neonatal complications overtime. **Keywords:** Checklist, childbirth, Obstetrical complications

Background

Childbirth is a moment of overwhelming expectation and anxiety for the family as a whole and the couple in particular. The World Health Organization estimates more than 130 million births occur every year worldwide [1]. In 2015, about 303,000 women died from preventable causes related to pregnancy and childbirth. Safe childbirth remains a daunting task, particularly in low-resource settings where most pregnancy-related deaths occur. Cameroon's maternal mortality rate, estimated at 782 per 100,000 live births in 2011 is unacceptably high [2]. The majority of these complications and deaths are preventable. Therefore, skilled healthcare before, during and after child birth is vital [3].

Several strategies have therefore been put in place to improve the quality of care and reduce the mortality of women giving birth. Those strategies are: Emergency Obstetric and Neonatal Care, family planning and skilled attendance at childbirth [4,5]. In view of the complex nature of childbirth, useful tools have been developed to ensure the mother and newborn receive skillful and the safe care. These tools include: case notes, the partograph and the checklist [6]. The checklist is a structured 28-item recall tool of scientifically-proven delivery practices, which targets the prime causes of maternal deaths, intrapartum-related stillbirths and neonatal deaths in health facilities worldwide [7].

The WHO Safe Childbirth Checklist is intended for use at four pause points during facility-based births, to help health workers ensure that essential birth practices are performed at critical moments for every delivery. These pause points enable midwives to concentrate on protecting the mother and newborn against dangerous complications.

Maternal and neonatal mortality rates are key indicators of the health system's strength [8]. The institution and implementation of strategies to prevent and manage pregnancy-related complications is a necessity for every health facility. The Safe Childbirth checklist is one such tool recently implemented in the Gynecology and Obstetrics unit of the Yaoundé Gyneco-Obstetric and Pediatric Hospital to improve the quality of health care. This manuscript is a report of the qualitative and quantitative assessment of the use of the WHO Safe Childbirth checklist in this unit since its implementation.

o Main Objective

Our main objective was to evaluate the change in attitude and practice following attitudes and practice of nurses and compare outcomes in cases where it was and was not used, 6 months after introduction of the safe childbirth checklist at the Gynecology and Obstetrics Department of the Yaoundé Gyneco-Obstetrics and Pediatrics Hospital (YGOPH).

o Specific Objectives

More specifically, we assessed the frequency of use of the checklist, to determine the completion rates of the checklist, to do a comparative analysis of outcomes in cases where the checklist was and was not used and to evaluate the change in attitudes and practice of nurses since its implementation.

Materials And Methods

Study design, site and duration

We carried out a cross sectional and retrospective study at the maternity unit of the Gyneco-Obstetric and Pediatric Hospital, Yaoundé-Cameroon (YGOPH). Data of deliveries conducted from January 2018 to June 2018 was collected over a period of one month (July 2018).

Participants and data collection

Inclusion criteria

- **For the qualitative analysis:** Staff of the Gynecology and Obstetrics department of the YGOPH who had received training on the childbirth checklist

- **For the quantitative analysis:** All delivery records within the study period (from the implementation of the checklist to June 2019) at the YGOPH were targeted for this study.

Exclusion criteria

- Incomplete files (files without the delivery route mentioned)
- Files of women referred to YGOPH in post-partum
- Files of women referred to other institutions for delivery from YGOPH
- Case reports of women managed for pathologies in pregnancy without ensuing delivery at YGOPH

Variables and data sources

After obtaining administrative authorization and approval of the research proposal, the questionnaire on the use of the WHO Childbirth checklist was administered to the staff of the gynecology and obstetrics department while quantitative data were retrieved from the delivery records of all parturients as applicable. The study took place in several steps.

The first step was to use a predesigned data collection sheet to collect the following data from:

Parturient files

- Identification: name, age, place of residence
- Past history: obstetric, surgical, medical
- Completion rate of the checklist for each parturient and newborn
- Files with checklists and without checklists
- Obstetric and neonatal complications

After which information was collected from the staff using a questionnaire,

From the staff

- Identification: name, age, sex, rank, work experience, position held
- Questions related to knowledge of the checklist
- Questions on the utilization of the checklist at the service

Statistical analysis

This was done using the SPSS version 23-0 software. The association between qualitative variables expressed in frequencies and percentages was investigated using the Chi square or Fisher test. The student test and Mann Whitney tests were used to investigate the association between quantitative variables expressed in means and median.

Ethical considerations

After obtaining administrative authorization and approval of the research protocol, we began the study in respect of ethical principles. Data collection was done with strict respect of the principle of confidentiality. The rationale of the study was clearly explained to every staff with consent obtained. The identity of every participant was concealed through consecutive numbering.

Results

Out of 1611 deliveries conducted, 1001 files were retrieved from the archives and 976 were retained. Twenty-five were excluded: seven abortions, nine pregnancy-related pathologies that were discharged before childbirth and nine others referred to other facilities or sent home before childbirth. The checklist was used in 828 files during the study period giving a usage rate of 84.8%. We observed that the highest proportion of files without filled checklists were those of women who gave birth in January and February. However, an increasing trend in the usage rate was noted, with a peak at 93.9% recorded during the months of May and June. (See Table 1)

The mean age of our study population was 28 ± 6 years with a range of 15 to 44 years. The most represented age group was 25-29 years. (See Figure 1) Majority of our population was paucipara. (See Table 2) Three peripartum pathologies were common in the medical history of parturients: hypertension, gestational diabetes and postpartum hemorrhage. The most frequent was hypertension. (See Table 2) Caesarean sections were the most frequent prior surgical procedures performed on parturients as shown in figure 2. The proportion of caesarean delivery files with unfilled checklists was greater than vaginal delivery files with unfilled checklists. (See Table 3)

The completion rate for different pages of the checklist increased with time. This increasing tendency was most remarkable from the 5th to the 6th month for pages 2 and 3. Completion rate of pages 2 and 3 was low from the 1st to the 5th months (consistently below 10%). Conversely, pages 1 and 4 of the checklist had a major role to play in the increasing trend of the overall completion rate during the first five months, with values surging above 60%. (See Supplementary Figures 1 and 2)

Obstetric complications were similar in both groups. (15.3% Vs 14.9%, $p = 0.883$) (See Table 3) Further analysis revealed that fewer obstetric complications occurred in the group with checklists compared to those without during the last 2 months (6.9% Vs 9.5%). (See Figure 3) A significant reduction in the onset of pre-eclampsia and eclampsia was noted with the use of the checklist (2.1% Vs 5.4%, $p = 0.017$). The proportion of neonatal deaths recorded amongst cases with a used checklist was smaller compared to cases without checklists (0.2% Vs 0.7%, $p = 0.380$). (See Figure 4)

The maternity staff responsible for using the checklist was made up of 19 persons. Ten qualitative assessment data collection sheets were distributed to them. Two out of 10 were not properly filled, so eight were retained and analyzed. Knowledge about the use of the checklist was graded as moderate. Five out of eight defined the SCC as a control, monitoring and recall tool, while 2/8 vaguely defined it as a safety tool containing a management protocol and 1/8 had a mix up, reporting that the SCC was equivalent to the checklists used to transfer patients from one medical unit to the other. More specifically, six out of eight participants reported that the SCC gives information about the patient, serves as a reminder for action to take at each step of care and identifies risks for complications. The remaining two knew it as a tool which states the management procedure of the mother and child at birth. Three out of eight (3/8) staff reported that they still needed to learn on job after the training session on how to use the checklists.

Approximately 4/8 nurses working at the maternity had a bad first impression of the SCC as they found completing the checklist to be too much workload. The remaining four reported that the checklist improved the organization of work, the orientation of patients and the quality of care offered. Most nurses knew the right instances when to use the checklist. The suggestions provided by five respondents were: the creation of a Cesarean section checklist (2/8), making the checklist anonymous (1/8), making patient assessment at discharge more effective (1/8) and giving more explanation on how to use it (1/8). When asked to compare the quality of work before and after implementation, 6/8 nurses felt that health care quality, team work and knowledge about patients improved while the number of complications reduced after the implementation of the checklist. On the other hand, 2/8 complained that they observed no improvement.

A prominent finding was that 3/8 participants shared that nothing prevented them from using the SCC, 2/8 said that the midwife's attitude played a determining role in the non-use of the checklist while 3/8 reported not using it either due to laziness or absence of SCC in patients' medical records.

Discussion

Maternal Mortality Rate (MMR) in Cameroon has increased considerably between 1990 and 2014, with 430 – 782 deaths per 100 000 live births, which is unacceptable. These deaths pushed the health sector to generalize the use of the partograph during childbirth, as a quality indicator and a tool to reduce maternal mortality. However, this practice has had limitations since 2010 – 2011 as it doesn't integrate early post-partum follow-up and it does not indicate thresholds for some risk factors of materno-foetal morbidities like premature rupture of membranes and preeclampsia. The World Health Organization (WHO) advocates the use of safe delivery checklists as it integrates other variables to improve the standard of care for women and babies at the time of childbirth. No study was found on this in Cameroon. As a hospital whose primary mission is to provide quality maternal and child care, we saw the WHO SCC as a gold mine to explore. Therefore, we instituted the WHO SCC and studied the relationship between its use and materno-foetal outcomes.

We found that introducing the WHO SCC using the engage-launch-support strategy was a rewarding task. The improved adherence to EBP is attributed to the use of the checklist as that was the new strategy implemented in the unit. The engage phase involved the education of service providers on the checklist during a regular staff meeting, providing them with copies of the checklist and instructing them to incorporate it in their routine practice. Members of the department imbibed and incorporated the checklist into their routine practice as reported in the results section. Very few adaptations were made to the checklist to suit our local context at this time. After concertation, the duration of premature rupture of membranes which is one of the conditions to start maternal antibiotics was modified from greater than 18 hours to 6 hours on page 1 of the checklist. Although no formal practical training sessions were organized, the health care providers learned by applying what they were taught on the job and supporting each other. Consequently, every woman with premature rupture of membranes in whom spontaneous labour did not occur after at most 6 hours was rapidly identified using the checklist and managed as indicated. The assessment of other materno-foetal outcomes such as bacterial vaginitis, early neonatal sepsis and their association with the use of the checklist was not done because this information was not available in all medical records.

The official launching of the WHO SCC was done at a seminar organized in the month of March 2018. Implementation outcomes included the level of knowledge, the usage rate of the WHO SCC and the health of mothers and newborns. The overall adoption rate was (828/976 files; 84.8%). This is about double the rate recorded in a tertiary care setting in Sri Lanka during a prospective observational study, but similar to findings in Namibia, a Sub Saharan African country [9,10]. The pages with the following childbirth practices were checked least often: confirming if mother needed to start antibiotics or antihypertensive treatment during labor or after delivery, seeking an assistant during labor, checking the availability of mother and baby's essential delivery supplies, abnormal bleeding control after birth, early breastfeeding, baby's referral, special care, monitoring and the newborn's need for antibiotics.

Four out of eight service providers complained that the checklist increased their workload while 2/8 cited the non-availability of checklists in patient files as the reason for non-use of the checklist. The former reflects a problem with either their attitude or the level of knowledge on the checklist while the latter could be handled by systematically pinning a checklist to every nursing file. The inclusion of the use of the checklist in their work package without any practical training for easy use tips could also be the reason. This explains the suboptimal utilization of the checklist. These findings are different from those reported by Perry *et al.* who reported that end users of the checklist in a global collaboration were extremely willing to use the checklist when first introduced [11]. Most service providers (5/8) defined the WHO SCC as "a control, monitoring and recall tool which serves as a reminder for actions to take at each step of patient care". The challenge therefore is to work on attitudes of providers and to improve the practice of Childbirth checklists through refresher training sessions and supportive supervision.

The estimated occurrence of preeclampsia and eclampsia was less than 3% in our study and a higher number of cases were associated with the non-use of the WHO SCC. This is similar to the findings reported by the largest hospital-based cohort on the prevalence of pre-eclampsia in Low Middle Income Countries (LMICs), the WHO Multicountry Survey reported an overall prevalence of 2.2%. On the other hand, the prevalence of preeclampsia found in our study was

relatively low, when compared to that found in 2014, in three referral hospitals in Cameroon which was between 8 and 12% [12]. Furthermore, although the heterogeneous nature of preeclampsia makes it unlikely that a single risk factor can predict women likely to develop it at birth or in post-partum [13], the reduced proportions of patients with preeclampsia seen in the records of those for who the safe childbirth checklist may be the result of prompt intervention following increased routine BP checks associated with the use of the checklist. Published reports show that patients with obstetric complications such as eclampsia/preeclampsia frequently undergo cesarean sections especially as emergencies [14]. Therefore, the short reaction time available in emergencies could explain the non-use of the checklist. However, during our qualitative analysis, none of the staff reported emergencies as one of the reasons for not using the checklist. And emergencies should not deter the healthcare provider from providing essential birth practices as that is what will save the patient.

Over time, with the implementation of the use of the checklist with parturients, a decline in obstetrical and neonatal complications was noticed(Table ...) as the rates of neonatal complications dropped during the 6 months of the intervention. Checklists were incorporated into patient files. Obstetrical complications rose during the first four months from 7.2% to 20.7% and then dropped to 6.9% during the last two months amongst cases with filled checklists. Poor utilization and completion of the checklist during the first 2 months may have contributed this. We strongly believe that the use of the safe childbirth checklist enhanced adherence to essential birth practices and thus during the post intervention audit, more complications were noticed when the checklist was not in use.

Study limitations

This is a retrospective study. we had no influence on the quality of data entered into the delivery records. However, measure taken to minimize this limitation was comparison with data in delivery registers and service reports. The study was only carried out in one facility because it was a pilot research work. From the positive results obtained and presented to the personnel, we intend to get other health facilities to implement this recall tool. The fact that logistic regression was not carried out is a limitation that prevents the prediction of the nature of the association between outcome and checklist use or non use.

Conclusion

Increasing utilization of the checklist was confirmed and obstetrical/ neonatal complications significantly reduced overtime. The latter indicates the use of the childbirth checklist as an indicator of quality performance in maternal and reproductive health.

List Of Abbreviations

EBP: Essential Birth Practices, **HGOPY/YGOPH:** Yaounde Gyneco-Obstetric and Pediatric Hospital, **SCC:** Safe Childbirth Checklist, **WHO:** World Health Organization

Declarations

Ethical considerations

Ethical approval was obtained from the Institutional Review Board of the Yaounde Gyneco-Obstetric and Pediatric Hospital. Data collection was done with strict respect of the principle of confidentiality. The rationale of the study was clearly explained to every staff with consent obtained. The identity of every participant was concealed through consecutive numbering.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and/or analyzed during the current study are available from the corresponding author on request.

Competing interests

The authors declare that they have no competing interests.

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None

Authors' contributions

SJD: introduction of the checklist at the YGOPH, manuscript revision, director and correction of work, **NIEW:** data interpretation, write up of first manuscript, literature search, **CHK:** study design, data collection, **WT:** data analysis, manuscript revision **PF:** director of the intervention and research work, manuscript revision **BAL:** data analysis, manuscript revision, **RNO:** research conception, introduction of the checklist at the YGOPH, manuscript revision, **AIIF:** research conception, supervisor of the research work, final corrections of the manuscript

All authors read and approved the final manuscript.

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Tables

Table 1: Frequency and proportion of the utilization of the checklist

Month	Groups		Proportion	Total
	check-list use	No checklist		
January	110	53	67.5	163
February	162	48	77.1	210
March	122	13	90.4	135
April	113	13	89.7	126
May	130	8	94.2	138
June	191	13	93.6	204
Total	828	148	84.8	976

Table 2: Clinical characteristics of our study population

	Frequency (n)	Percentage (%)
Parity		
1-2	520	53.3
3-4	217	22.2
≥ 5	81	8.3
Unknown	158	16.2
Total	976	100.0
Gravidity		
1-2	442	45.3
3-4	289	29.6
≥ 5	245	25.1
Total	976	100.0
Previous pathology		
Hypertensive disorders	34	3.5
Gestational diabetes	2	0.2
PPH	3	0.3
None	937	96.0
Total	976	100.0

Table 3: Relationship between the use of the checklist and obstetric outcomes

Mode of delivery	G1* (N1=828)	G2* (N2=148)	Total	P-value*
Vaginal delivery	699 (84.4%)	108 (73.0%)	807 (82.7%)	0.001
Cesarean section	129 (15.6%)	40 (27.0%)	169 (17.3%)	
Total	828 (100.0%)	148 (100.0%)	976 (100.0%)	
Obstetric complications	G1 (N1=828)	G2 (N2=148)	Total	P-Value
Yes	127 (15.3%)	22 (14.9%)	149 (15.3%)	0.883
No	701 (84.7%)	126 (85.1%)	827 (84.7%)	
Total	828 (100.0%)	148 (100.0%)	976 (100.0%)	
Eclampsia/Pre-eclampsia	G1* (N1=828)	G2* (N2=148)	Total	P-Value
Yes	17 (2.1%)	8 (5.4%)	25 (2.6%)	0.017
No	811 (97.1%)	140 (94.6%)	951 (97.4%)	
Total	828 (100.0%)	148 (100.0%)	976 (100.0%)	

G1: group with checklist used; G2: group with no checklist used; P: P-value

Supplementary Materials

Supplementary Figure 1: Evolution of the completion rate of the checklist over time

Supplementary Figure 2: Evolution of completion rate per page of the checklist

Figures

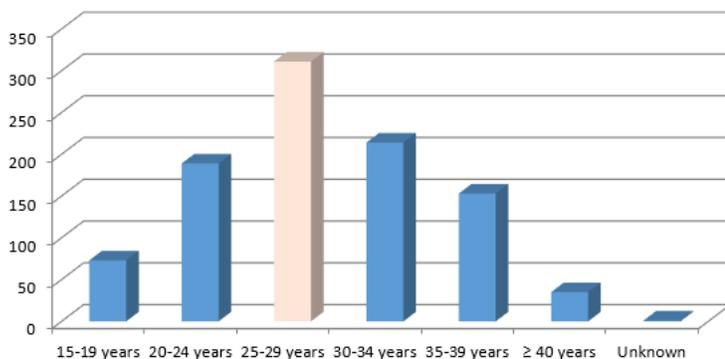


Figure 1

Prevalence of different age groups in study population

■ Cesaerean section ■ Myomectomy ■ Others ■ None

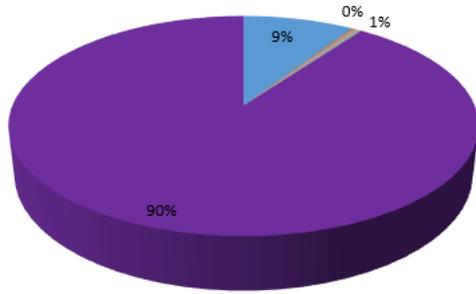


Figure 2

Past surgical history

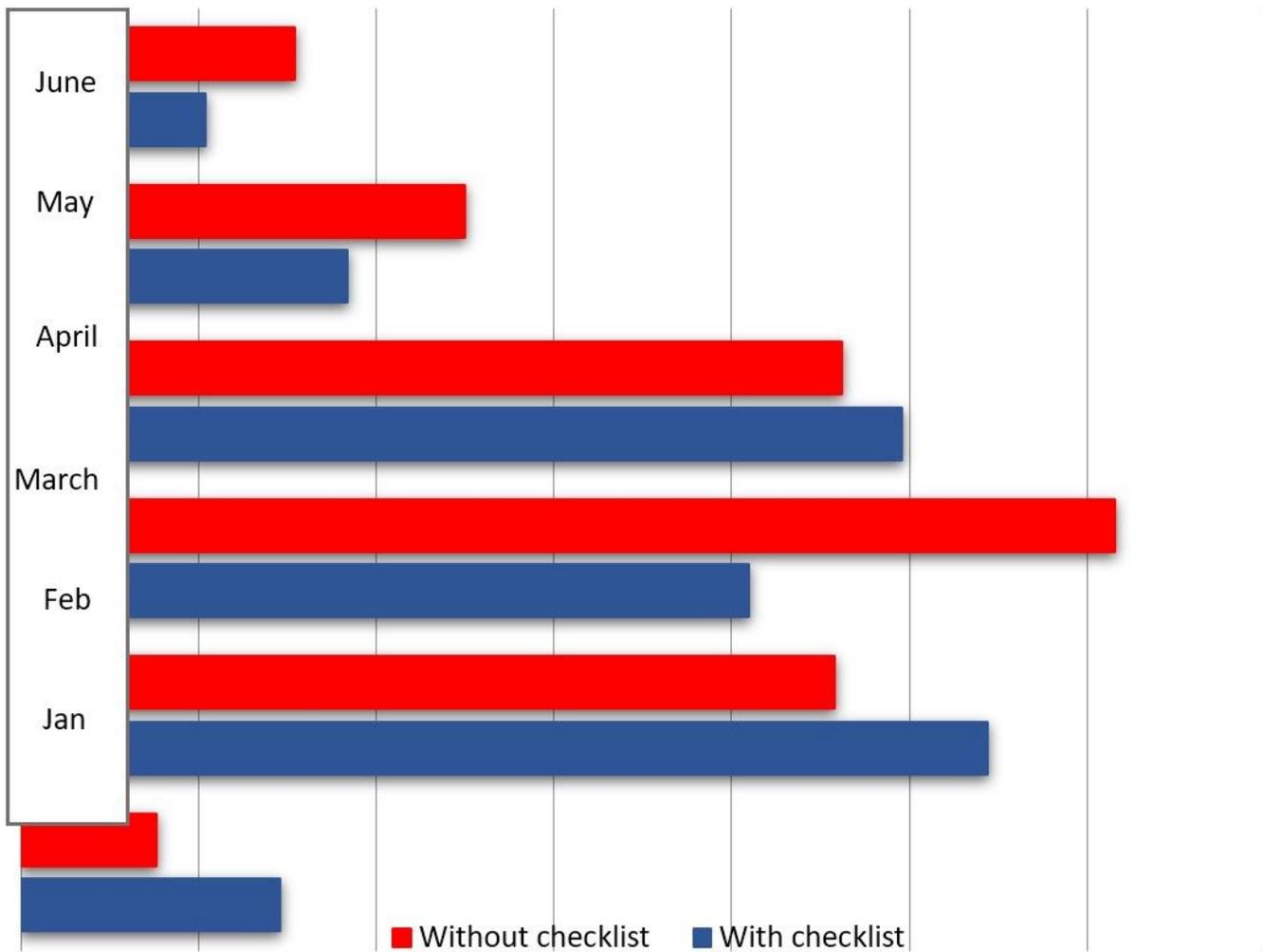


Figure 3

Evolution of obstetrical complications per month

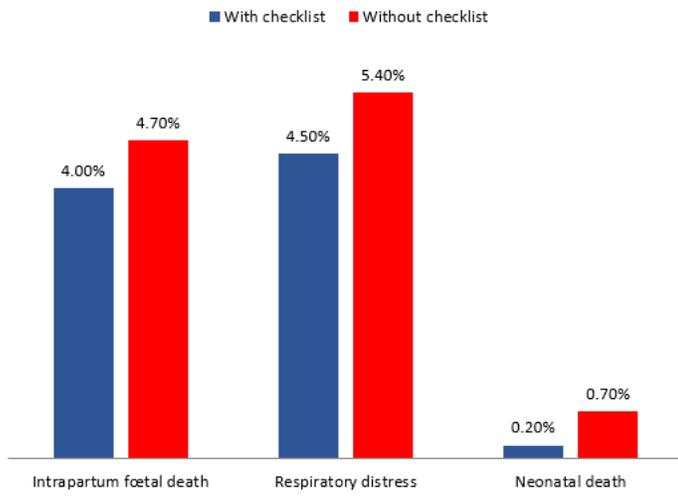


Figure 4

Association between neonatal complications and the use of the checklist

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [SupplementaryFig2Evolutionofcompl.pdf](#)
- [SupplementaryFigure1Evolutionofthecompl.pdf](#)