

Detection of Obstetrics Early Warning Signs among Midwives at Aga Khan University Hospital Nairobi, Kenya

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Abstract

Back ground: Early identification of life threatening signs of deterioration, timely escalation or reporting of the changes, coupled with timely review and management of the patient is fundamental in improving if not maximizing patient's safety. Various studies have revealed that physiological anomalies exist before patients are rushed to intensive care unit or even succumb. Modified early obstetrics warning signs (MEOWS) chart is developed for the obstetric population for the purpose of enabling early signs of deterioration, timely escalation and review of patient. **Study objective:** To determine the influence of modified early obstetrics warning signs chart in early detection of obstetric emergencies by midwives at the Aga Khan University Hospital Nairobi. **Methodology:** Cross-sectional study design method was used. All nurses and midwives working in labour and postnatal wards were targeted. A total of 42 respondents were recruited from whom data was collected using a structured questionnaire. Systematic random sampling was done to get 321files with MEOWS chart. Two key informants participated in the study. Data was analyzed using Statistical Package for Social Sciences (SPSS) mainly by use of descriptive statistics. Descriptive statistics included mode, mean, median, standard deviation. Data was presented by use of graphs, pie charts and tables. **Findings:** Results showed that majority of respondents acknowledged that MEOWS chart enables early detection of obstetrics warning signs. Most users also indicated that Color coding, alerts them of possible signs of deterioration. Most respondents also, agreed that the chart provide clear instructions on escalation and prioritization of care. However, responds by doctors, to escalations within a duration of 10min was not always adhered to. Results from the charts revealed that documentation of physiological parameters and observable variables differences was key in early trigger of warning signs and timely escalations. **Conclusion:** Appropriate use of MEOWS enables early detection of obstetrics warning signs, timely escalation of triggers and management of patient.

Key words: Modified early obstetrics warning signs, Track, Trigger, and Escalation.

1. INTRODUCTION

Early warning signs (EWS) is a chart that uses physiological parameters to 'track' patient's health state to identify early signs of deterioration and 'trigger' timely clinical intervention¹. Early warning systems provide quantifiable evidence that a patient's condition may be deteriorating and more skilled clinicians must be notified to review the patient and advice on intervention. The cumulative MEOWS score rise as the patient condition deviates from normal, and values above a fixed threshold necessitates a call to the medical emergency team for review (MET)². The major parameters scored are, temperature, pulse rate, blood pressure, respiratory rate, level of consciousness, oxygen saturation percentage, and urine output. Fixed set points in a color-coded chart trigger a nurse to escalate the assessment incidences by alerting the rapid response team or provider as a patient's condition deteriorates. This allows for transfer to the intensive care unit in a timelier manner³. To ensure that reliable, simple and comprehensive communication between nurses/midwives and SBAR model is used doctors. This model integrates well with the MEOWS by standardizing communication during escalation⁴.

Previous studies have revealed that dismal vital sign documentation, poor documentation of deranged observation of major parameters, inadequate knowledge and, failure to react to unusual indicators, deficiencies in supervision and failure to escalate noted deterioration for assistance, have all added to the substandard healthcare of inpatients⁵. It is documented that numerous insignificant deviations can lead to a major breakdown. When slightly deranged observations are assumed, major deviation occurs which are much more difficult to manage, leading to avoidable mortality or morbidity of inpatient⁶. The MEOWS chart, having been successfully implemented and adopted as an assessment tool in obstetrics population at the Aga Khan university Hospital Nairobi called for the need to evaluate its impact in enabling early detection of obstetrics warning signs.

1.1 Specific objectives

To determine the influence of modified early obstetrics warning signs chart in early detection of obstetric emergencies by midwives at the Aga Khan University Hospital Nairobi.

2: Literature Review

2.1 Early detection of Obstetrics warning signs

CEMACH and other health organizations in the United Kingdom recommend implementation of MEOWS due to fears that rapid deterioration in obstetrics and maternal health may be undetected⁷. The key to preventing devastating outcomes in pregnancy, labor and puerperium is by prompt detection of serious illness in the childbearing woman so as to make swift response, timely referral and achieve excellent care based on sound evidence⁸.

It is necessary and urgent to routinely use the national MEOWS chart in all pregnant or postpartum women to aid recognition and treatment of those with confirmed or/ are experiencing rapid health deterioration. The physiological parameter cumulative scores on the chart should not only be documented but also used to activate appropriate response to improve or reverse the condition of the patient⁹.

2.2: Reason for scoring

Bedside observations of vital signs charts are the backbone of identifying patient deterioration, however, observing and recording of physiological parameters remains in most cases poor¹⁰. The monitored parameters observed during labor are interpreted individually for example, when the Cardiotocography is done documentation of the findings are mostly indicated in prose in the midwives notes, observations of vital signs are charted separately or written in prose in the notes or charted on a Partograph. This kind of documentation only allows for individualized interpretation of findings which is not related to findings in various charts or notes. Moreover, when parameters are documented individually they do not give obvious relationships to all the variables being measured. In this case, slightly deranged variables are, assumed as normal since they are not observed with all other variables that could also be slightly deranged. Combinations of many slightly deranged variables would be a trigger to early detection of deterioration of the mother, the fetus or both. Early warning signs can increase the chances of early escalation to the Rapid Response Team system by summing up physiological parameters that gives standard view of the patient condition¹¹. She said "We want to encourage recognition of high-risk patients as soon as possible". The doctors cannot be effective if they are not called to the patient bedside in time.

Though a single-parameter method has been effective, supposing health institutions could recognize patients' at-risk way before there is substantial change in vital signs? Imagine a system is put in place that can react to several parameters simultaneously and recognize patients at-risk at the earliest indication of a subtle change in observations of physiological parameters? Such an Early Warning Scoring System (EWSS), MEOWS etc., experts say, could produce more benefits for patients and health institutions by more timely detection deteriorating patients and timely reversal of condition that could be fatal¹². In the transforming maternity services guide (2012) the National Health Services noted that there is prove that critically unwell patients or patient who become critically unwell while in health institutions could get substandard care. This could be as a result of non-recognition of deterioration or due to the fact that even if signs of clinical deterioration were noted they were not appreciated and no measures were taken to reverse the situation promptly.

Sometimes, a patient's condition changes so incrementally that a nurse might not notice the danger in time to prevent a bad outcome¹³ However, unless those changes are plotted on a visual map, especially a color-coded visual map, it may be difficult for a nurse to

detect patient's deterioration¹⁰. A score is given to each parameter and added together to give a cumulative total. Hence, the higher the scores, the sicker the patient and the more urgent bedside review is needed to save the patient. A single significantly deviated parameter which denotes notable anomalies. For instance, a substantial change in blood pressure could lead to an escalation; subsequently a significant change in any other parameter might also prompt a call for review¹⁴. In some cases, an instinct that something is wrong might lead to escalation without any documented prove or any scientific backing. Several team reports that, nearly 40% of escalations are generated because the nurse senses that something is wrong with the patient¹⁵.

2.3: Dissemination of MEOWS score Trigger

The absolute approach to get doctors' attention and convince them to assess a patients during escalation is by giving measurable indication of deterioration¹⁶. They further, added that measurable deviations help doctors to prioritize care. The chart increases team situation awareness and increase timely diagnosis and management¹⁷. Unfortunately, some doctors do not necessarily believe that information documented by midwives on the charts support diagnosis, hence they do not pay attention to related findings¹⁸. On the contrary, it was noted that observations charts are the most sought after nurse's/midwives documentations by doctors. It is absolutely necessary for doctors to review patient at the stipulated time frame to increase the chances of complete recovery of the patient¹⁹. Information in hospitals should be given utmost attention as the results of ignoring it is sometimes fatal²⁰. Recent studies indicated that communication among health workers in labour ward and postnatal ward is the key determinant of possible good outcome of the patient⁶.

3 Study Methodology

3.1 Study design

Descriptive cross- sectional design was used to collect data from 42 nurses/midwives, and systematic random sampling method to get 321 MEOWS charts used to monitor mothers in labour. Two key informants participated in the study.

3.2 Validity and reliability of the data collection tools

Validity of the data collection tools was done by pre-testing of the questionnaires and checklists and adjustments done accordingly. To ensure study reliability, data was counter-checked during entry for completeness.

3.3 Data Collection

A self- administered semi structured questionnaire was used to collect data.

3.4 Quantitative data analysis

Statistical package for social sciences (SPSS) version 20 was used to analyze numerical data. Descriptive statistics; means, medians and their corresponding 95% confidence intervals (95%CI). Spearman's correlation coefficients and corresponding p-values were calculated. The sent point of the level of significance was at 0.05. Bivariate analysis was done to determine relationships between variables.

3.5 Ethical consideration

Ethical clearance was obtained from the Mount Kenya University ethics board. Further, clearance was sort from Aga Khan University research and ethics board. The researcher also sought Permission from the maternity unit management to collect data. Prior to data collection, informed consent was obtained from the respondents. Participation was voluntary. Confidentiality of the data and information was maintained by use of protected secret passwords and used only for the purpose of the study.

4 RESULTS

4.1 Demographic Characteristics

Table 1: Age of the Respondents

Age of group	Frequency	Percentage
29yrs and below	12	28.9
30 to 40 years	24	57.1
41 years and above	6	14.3
Total	42	100

Respondents above 41 years were fewest at 6 (14.3%) followed by those below 29years old at 12(28.9%), most participant age ranged between 30 to 40 year 24(57.1).

Table 2: Work station

	No	Percentage
Labour	16	38.1
Post ward	15	35.7
Postnatal Pavilion Maternity	11	26.2
Total	42	100

Most of the respondents work in labour ward at 16(39%) followed by general postnatal ward at 14(34.1%) and Pavilion postnatal ward at 11(26.8%).

Table 3: Duration of work in Maternity unit

Duration of work in Maternity unit	No	Percentage
Month to 2 Years	8	19
3 to 4 years	15	35.7
More than 5 Years	19	45.2

The smallest number of respondents 8(19%) had worked in the unit for less than 2years, 15(35.7%) had worked for 3-4 year with the majority 19(45.2%) had worked in the unit for more than 5 years

4.2: Detection of warning signs

Table 4: Early detection of obstetrics warning signs

	Number of responses	Percentages
Make it easier to detect early warning signs		
No	2	5.1
yes	37	94.9
Give a comment to support the above your choice		
Unfavorable	3	13.6
Favorable	19	86.4
Ever nursed a patient who triggered		
No	20	47.6
Yes	22	52.2
If yes did the chart play any role in the warning		
No	3	13.6
Yes	19	86.4

There was agreement by majority of respondents 37(94.9%) that the MEOVS chart helps in the detection of early warning signs. However, a small minority 2(5.1 %) indicated that the chart does not help in early detection of early warning signs. Most respondents gave favorable comments 19(86.4%) on the ease of early detection obstetrics warning signs while 3 respondents giving unfavorable comments. Most respondents 22(52.2%) nursed patient with a trigger, the rest 20 (47.6%) did not have a trigger. Among those who nursed patients who triggered, majority 19 (86.4%) indicated that the MEOVS chart helped them in early detection of deterioration. However, a small minority, 3(13.6%) indicated that the chart did not play a role in detection of deterioration.

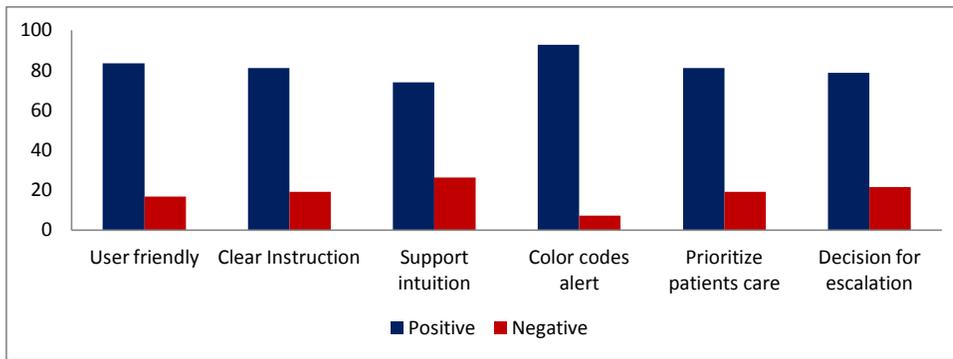


Figure 1: MEOWS chart contribution to users

Majority of the respondents 35(83.4%) agreed that the MEOWS chart is user friendly while 7(16.7 %) had contrary opinion. Most of the respondents 34(81.0%) admitted that the chart gives clear instruction the least disagreed on the clarity of the chart. Many respondents 31(73.8%) felt support to intuition while 11(25.2%) felt no support to intuition. A huge percentage 39 (92.8%) felt that the color codes alert them while 3(7.2%) did not concur. Majority of the respondents 34 (81.0%) agree that the chart enables them to prioritize care while 8(19%) disagree. Majority 33.0(78.6%) of the respondents agreed to the fact that the MEOWS enable decision to escalate, while 8.9(21.4%) are of the contrary opinion.

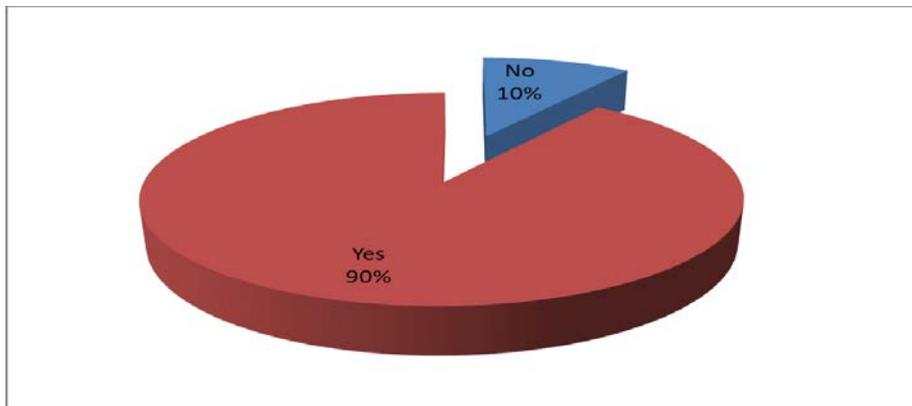


Figure2: Team work and communication among respondent and unit management

Most of the respondents 37(90%) indicated that the chart enabled team work while a small number of respondents 4(10%) indicated that the chart did not support team work.

4.3: Escalation of MEOWS trigger

Escalation of the deranged MEOWS score and quick review and management of the patient is key is successful use of the chart. Escalation is done by the nurses/midwives to doctors who are expected to review the patient within a stipulated period of less than 10 minutes.

4.3.1: Doctor response to trigger

To assess whether or not timely response to triggers is enhanced by use of the MEOWS chart. A question of responses from the doctors to review patients within stipulated time of 10 minutes after escalation was asked. Strongly disagree was rated at 1, disagree at 2, unsure at 3, agree at 4, and strongly agree at 5.

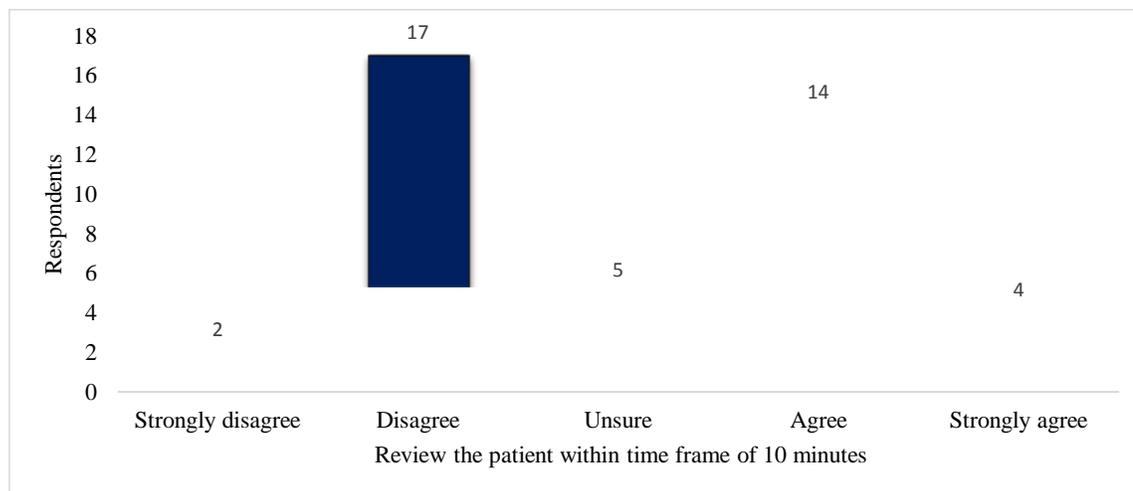


Figure 2:

Doctors Response to triggers

The smallest number of respondents 2(4.8%) strongly disagreed with the fact that doctors review patients within the recommended time frame upon escalation. Most of the respondents 7(40.5%) disagreed with that fact too. However, a small percentage 5(11.9%) were unsure. On the contrary, 14 (33.3%) agreed that review is done within 10 minutes while 4(9.5%) of the respondents strongly agree. Most of the respondents 24(57.1%) would not really count on the doctor to review the patient as recommended.

5 Discussion

5.1 Early detection of warning signs

The fundamental use of MOEWS is to detect early warning signs of deterioration of a patient and refer/ call for review. Early detection is aided by increased score, the higher the score the more deranged the physiological parameter and hence the need to call for help²¹. This increases patient safety and help avoid preventable morbidity and mortality. This study revealed that, 94.87% of the respondents indicated that the chart helps in early detection of early warning signs. This was reinforced by the key informants who said, “The MEOWS helps in identification and early referral of deteriorating patient for further management in intensive care unit”. The CEMACH recommended the adoption of MEOWS to aid early detection of deteriorating maternity patient. They added that it is easy to miss deterioration of the, maternity population due to increase in physiology reserve²².

After noting deterioration CEMACH advises that swift mechanisms have to be put in place to reverse the situation. There are suggestions that MEOWS enables recognition of a deteriorating patient and enables a standardized method of escalation²³.

There is agreement that the MEOWS increases detection of early warning signs. Maternal morbidity and mortality is increasing in developing countries. To mitigate this, and improve the outcome of pregnancy use of MEOWS for early identification of warning signs was among the recommendations²⁴. MEOWS is used to assess mothers who may report being unwell during antenatal visit a high cumulative score enables the nurse to organize for meticulous follow up until the patient condition improves²⁵. MEOWS chart aided timely detection of signs of sepsis in postnatal ward and treatment was initiated immediately²⁶. There is increased possibility of identification of early warning signs when MEOWS chart is used, this is because the slightly deranged parameters are assessed in view of other parameters that might also show slight deviation; observed together these parameters may cause a trigger which may not be the case when observed individually. Obstetrics specific parameters included in the MEOWS increases the possibility of early detection of abnormalities²⁷.

Nurses/midwives intuition score included in the parameters allows the midwives to use his/her independent judgement of the condition of the patient. In this study, (31)73.8% of respondents agree to the fact that MEOWS support intuition. In many cases midwives increase the frequency of observation of patient even behold the hospital protocol. If their worries are quickly acted upon then many deaths would be avoided²⁸.

Post-partum hemorrhage is a very common obstetric emergency with well documented protocols of what to do once it is detected, all in all, several deaths are documented from this condition due to late diagnosis and underestimation of the severity of the condition. The study emphasized on the importance of early detection of warning signs with use of all measures available including updated tools and improvement on hospital systems²⁹. Majority of midwives (80%) indicated that using a MEOWS chart enabled them easily detect warning sign in postnatal patients³⁰.

5.2: Escalation of Triggers

Communication between members of staff is crucial in enabling usage of the MEOWS. Communication among respondents and between respondents and doctors is informed by SBAR model that is printed behind each MEOWS chart. Emphasis on proper communication among health workers is encouraged by many studies, other studies do not only encourage communication but also team work to enhance common understanding of patients³.

5.3: Escalation among midwives and management

In earlier studies, the MEOWS chart was reported to increase team situation awareness and reduce delay in diagnosis and management of patient by midwives at Eastwards hospital². The over role health situation is given by a figure which means the same thing to everyone.

Midwives especially in the post-natal ward were able to access all the information documented by their colleagues in labour and hence have a complete overview of the patient. This helps in planning for action of a possible reoccurrence of previous emergencies. A study done earlier, concurred with this finding citing that communication among health workers is key in improving safety of the patient²⁷. Comparable view that figures had a specific meaning regarding the over role health of the patient as opposed to written prose, and several charts that have only a number of parameters charted on them were also noted²⁷.

Subsequently, the charts direct midwives upon recording the abnormal vital signs to alert senior midwives and doctors, facilitating shared understandings of deterioration and providing legitimacy for escalation of care. The use of a standardized manner of communication (SBAR) as indicated on the MEOWS also enables the respondents to improve on communication with each other. Improvement of communication among health workers using SBAR is highly adopted as a model to improve patient's safety³⁰. The midwives are able to probe for further information in case something important is forgotten. Nonetheless, a huge percentage (87.7%) of nurses were found not to escalate triggers³¹.

5.4: Doctor's response to triggers

The essence of the MEOWS chart is to ensure that upon detection of deterioration a doctor is involved to review the patient and give further guidance on the management to avoid avoidable complications. Similar assessment done in a research indicated that when midwives escalated triggers doctors did not review the patient in time². They further, said that sometime they begged for patient to be reviewed. The outcome of the patient who has triggered fully depends on timely review by the doctor and management¹⁷. The National Hospital Surveillance team in the United Kingdom advised that all patient with a trigger on MEOWS score must be reviewed at bed side by the available specialist even if he/she is not primarily the care giver².

Earlier study findings resonated with this study finding on improved communication between nurses and doctors when using MEOWS chart, they agreed that the chart provides a nurse with straight forward, unmistakable means of communicating deterioration¹⁶. MEOWS provides a chance to quantify all observation from every source giving a nurse a more informed reason to escalate¹⁶. An assessment on the response of doctors to escalation; 85% of the respondent said that doctors would not review the patients in time³², these findings resonate with our findings but the percentage in this case is remarkably high.

Conclusion

The study concluded that MEOWS enables early detection of obstetrics warning signs.

Recommendation

Timely review of patients within stipulated time should be optimized.

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