

Effect of Training on Modified Early Warning Score  
(Mews) To In-House Doctors at Fortis Hospital, Bengaluru

*By*

*Anjali K*

*Dissertation submitted for the partial fulfillment of the  
MBA Hospital and Health Management*

*Academic year, 2016-2018*



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**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that **Dr. ANJALI K** student of MBA Hospital and Health Management The IIHMR University, Jaipur has undergone internship training at **FORTIS HOSPITAL BANNERGHATA, BENGALURU** from 19/02/2018 to 14/05/2018.

The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish her all success in all his future endeavors.



Dr. ASHOK KAUSHIK

Dean, Academics and Student Affairs  
The IIHMR University, Jaipur



Dr. J.P.SINGH

Professor  
The IIHMR University, Jaipur

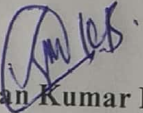
Date: 15-May-18

**BNGBG/ INTERNSHIP /MEDICAL SERVICES /70**

**TO WHOM SO EVER IT MAY CONCERN**

This is to inform that Dr. Anjali K, has successfully completed internship in the Department of Medical Services with the Project Title EFFECT OF TRAINING ON MODIFIED EARLY WARNING SCORE (MEWS) TO IN-HOUSE DOCTORS AT FORTIS HOSPITAL, BENGALURU, from 19<sup>th</sup> Feb, 2018 to 17<sup>th</sup> May, 2018.

For Fortis Hospitals Ltd.,

  
Kiran Kumar KB  
Manager – HR



THE IIMR UNIVERSITY, JAIPUR

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **Training Need Assessment and It's Evaluation with Respective to Modified Early Warning Score (MEWS) to In-house Doctors** and submitted by **Dr. Anjali K** Enrolment No. **MBA-HM-0384** under the supervision of **Dr. Jagjeet Prasad Singh** for award of MBA in Hospital and Health of the University carried out during the period from **19<sup>th</sup> February 2018 to 19<sup>th</sup> May 2018** embodies my original work and has not formed the basis for the award of any degree, diploma associateship, fellowship, titles in this or any other institute or other similar institution of higher learning.

  
Signature

## ACKNOWLEDGEMENT

I would like to express my special thanks to **Mr. Ashok Kaushik** (Dean, IIHMR University) and Mr. Hem Bhargava (Placement & Training Head, IIHMR University) for giving me the golden opportunity to pursue my dissertation at Fortis Hospital, Bannerghata, Bengaluru.

Secondly, I would also like to thank my parents and friends who helped me a lot in finalizing my projects within the limited time frame.

I am using this opportunity to express my gratitude to everyone who supported me throughout the course of my dissertation period at Fortis Hospital, Bannerghata, Bengaluru.

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My in depth understanding and learning at Fortis Hospital would have been incomplete without the valuable suggestions of my project internal guide **Dr. J P Singh** (Professor IIHMR University) for his constant supervision and support in completing the projects.

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# **EFFECT OF TRAINING ON MODIFIED EARLY WARNING SCORE(MEWS) TO IN-HOUSE DOCTORS AT FORTIS HOSPITAL, BENGALURU**

## **1. Background of the study:**

Morgan, Williams and Wright from United kingdom were the first to develop and publish the Early Warning Score (EWS). The Early Warning Score is all about “five physiological/vital parameters i.e. Heart rate, Systolic blood pressure, Respiratory rate, Temperature and Conscious level. Each parameter had a range of cut points (score) with corresponding colour-banded trigger points, it was not to predict outcome but to identify early signs of deterioration to serve as a track-and-trigger system (TTS). For example a respiration rate cut point range of >25/ min is indicated as alerting point of 2 indicating the need for escalation of intervention (James, 2014)

A further EWS system has been modified and standardised (Barlow GD, 2006) (Paterson R, 2006) . To the original EWS five physiological parameters system, arterial oxygen saturation was added in the observational chart (Duckitt RW, 2007) (Cuthbertson BH, 2007) and to trigger-tracker system urine as output was added to track the risk prone patients in ward. (Subbe CP G. H., 2007). In the United Kingdom different hospitals incorporated urine output, pallor, sweating, looking unwell in the early warning scoring chart but not scored as Clinical sign of deterioration (McLiveney F, 2008) . Of 33 unique Aggregate weighted Track and Trigger systems (AWTTs) were identified and also states further study is needed to improve AWTTs (Smith GB, 2008).

These are bedside score and track-and-trigger systems: nurses score observations of vital signs and calculate a total score to facilitate early recognition of a patient's deterioration. MEWS systems are used in conjunction with nurses' clinical judgement .

Aberrant physiology are common among Vulnerable patients in wards, clinical and physiological deterioration is evident for six (Fraklin C, 1994) to eight (Schein RM, 1990) hours before cardiopulmonary arrest. In such cases, arrest often occurs after a period of slow and progressive physiological deterioration that went unrecognized and/or inadequately treated hypoxemia and hypotension (G, 2005).

Non-recognition of deterioration in clinical status has implications for patient survival, which depends on nurses' decisions to summon assistance. Clinical signs such as skin tone, sweating, nausea or nurses' intuitive assessment of the patient being 'just not right' and 'looking unwell' (J,

2000) should be monitored regularly to limit avoidable, serious adverse events (SAEs) such as cardiac arrest, urgent and unanticipated admission to an intensive care unit (ICU) or even death. In addition to obvious ethical considerations, authorities in the developed world are concerned at the increasing number of claims for malpractice associated with SAEs (Mello MM, 2003).

## **2.LITERATURE REVIEW:**

A descriptive observational study on survey was conducted to final year nursing students at nursing college in Cape Town, South Africa. Purpose of this study was to increase in urgency for nurses to recognize early signs i.e. abnormal recordings for respiratory and heart rate, oxygen saturation level, systolic blood pressure, level of consciousness, urinary output and normal temperature of deterioration in patients and to take appropriate action to prevent serious adverse effects. Around 77 nurses took part in survey, which consisted of 7 questionnaires on encircling of abnormal vitals. Results showed low range scores secured by the final nursing students and hence, MEWS was recommended in there curricula as track and trigger system.(Lenord, 2015)

Tom Andrew conducted a study with a Grounded Theory Approach on how to report physiologically early deterioration using MEWS to ensure successful referral to doctors. Background of the study says there is lack in sensitivity and specificity in notifying the signs of deterioration as most nurses rely on subjective and subtle indicators, using grounded theory approach interviews and observations was carried out on 30 nurses, 7 doctors and 7 healthcare workers and results states that an quantifiable evidence tool will be effective way to refer doctors, MEWS was an effective bridging tool between professionals. Nurses unambiguously communicate deterioration condition and doctors can focus actions(Tom Andrews, 2005)

## **3.RATIONALE OF THE STUDY:**

In this study code blue MEWS analysis was consider where non-compliance among doctors was increased and also increase in ICU returns and transfers and code blue. Generally it's a responsibility of nursing staff to calculate MEW Scores but atFortis Hospital, Bengaluru according to new regulations this responsibilityhave been assigned to residents and registrar doctorsto calculate MEWS to all vulnerable in-patients.

#### **4.RESEARCH QUESTIONS:**

What is the knowledge level on MEW Score calculation among in-house doctors?

What is effect of training on MEW Score calculation among in-house doctors?

#### **5.HYPOTHESIS:**

H<sub>0</sub>: There is no effect after the training on MEW Score calculation among in-house doctors?

H<sub>1</sub>: There is an effect after the training on MEW Score calculation among in-house doctors?

#### **6.OBJECTIVES OF STUDY:**

The objective of the study was to:

- Assess the knowledge of In-house doctors on MEW Score calculation.
- Observe the effect of training on MEW Score calculation of In- house doctors.

#### **7.RESEARCH METHODOLOGY:**

##### **7.1 Study Design :**

Operational research study (analytical study) was conducted at Fortis Hospital, Bengaluru with the help of structured case scenario. The structured scenarios were used both in pre and post training. The duration for this study was for 3 months (Feb 2018 to April 2018).

##### **7.2 Sampling:**

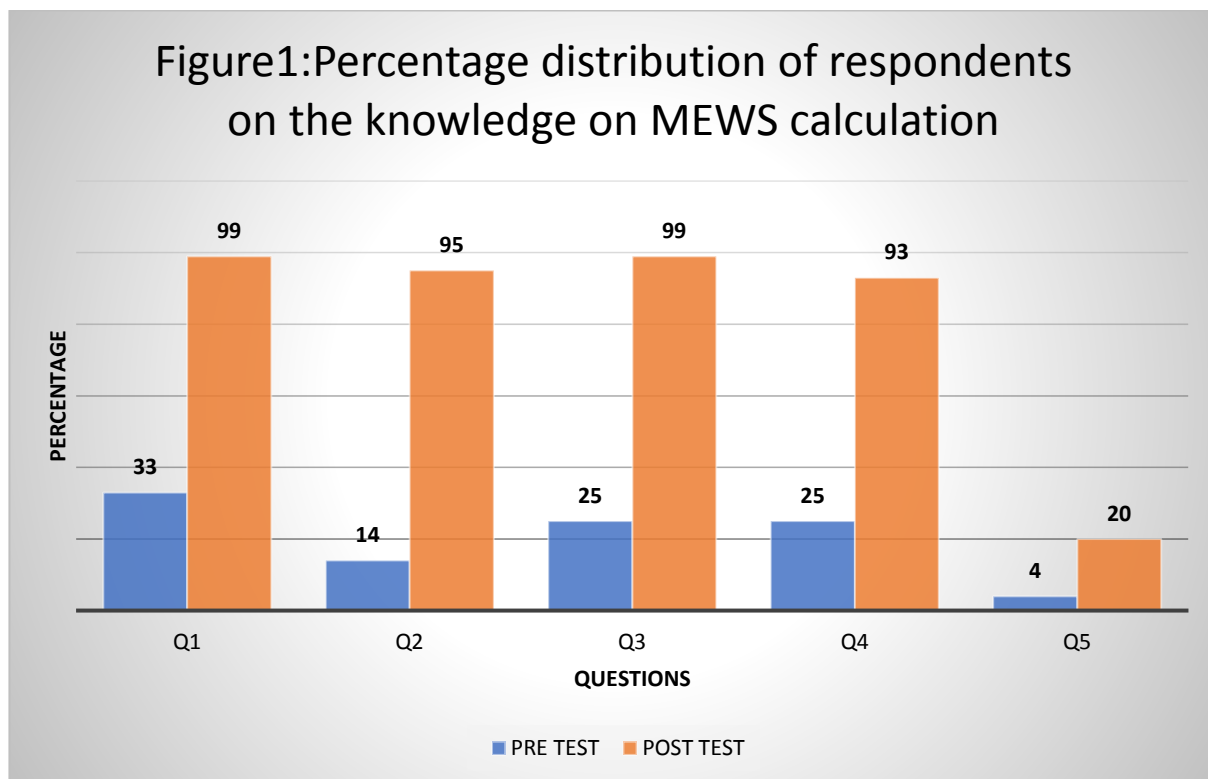
In this study purposive sampling was considered, and purpose of this study was to understand the knowledge of In-house doctors on MEW Score calculation. Inclusion and exclusion criteria were set for drawing the sample. The respondents were divided on hierarchy of Doctorates. MBBS, DNB 1<sup>st</sup> year and MD 1<sup>st</sup> year were considered as inclusion criteria in the study, DNB and MD- 2<sup>nd</sup>, 3<sup>rd</sup> year Registrar and consultants were excluded. Total of 97 in-house doctors were in inclusion criteria hence taken as study population.

### 7.3 Data collection and analysis:

A set of well defined-structured schedule with close-ended questions was developed. The schedule was focused on Healthcare provider's basic information and Case scenarios for calculation on Modified Early Warning Score, it was circulated among doctors before and after training. The raw data was entered and analysed from Microsoft Office Excel spreadsheet and also IBM SPSS Statistics<sup>16</sup> was used.

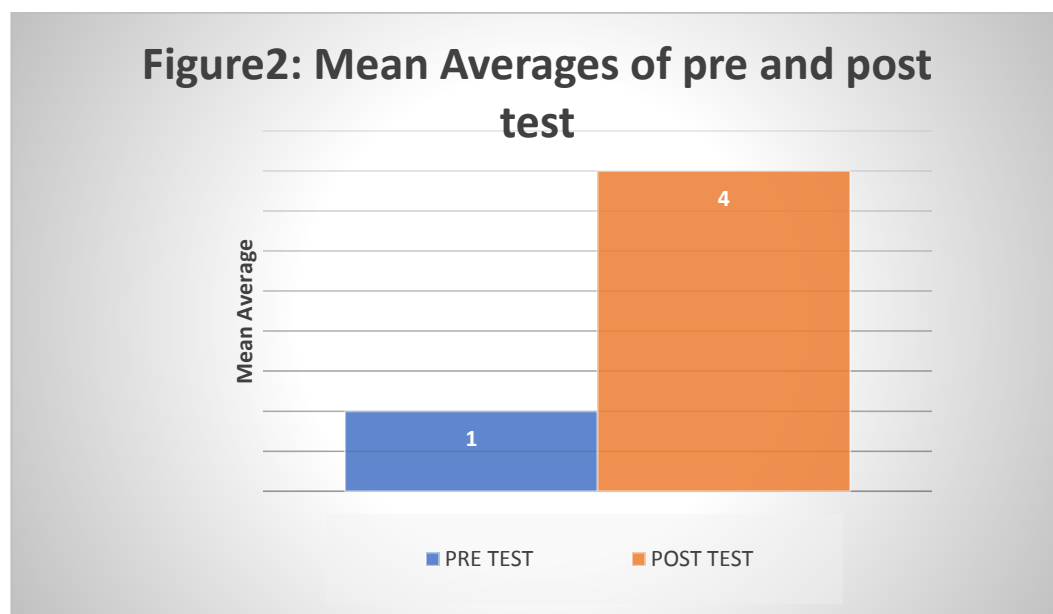
## 8.RESULTS:

Modified early warning score is a tool used for detection of early deteriorating condition of bedside patients, which can reduce ICU returns and transfers, code blue in the hospital. In our study respondents had no prior knowledge on calculating MEW Score but they were aware MEWS actions and their responses were based on knowledge gained from clinical placement experiences. The raw data was entered and analysed from Microsoft Office Excel spreadsheet and also IBM SPSS Statistics 16 was used to know frequency of the test.



5 case scenarios was considered as questions, it was taken to measure the knowledge of MEWS

from above table, question 1 to question 4, correct pre-test score is 24% and after training the correct post-test score is 96.5% but in case of question 5 a special case scenario was given and raise in scores from 4% to 20%.



Mean average scores of pre-test and post-test were improved from 1 to 4.

**Table 2: Paired T test – comparison between post-test and pre-test**

| Paired t-test          | t      | df | Sig. (2-tailed) | 95% Confidence Interval of the Difference |       |
|------------------------|--------|----|-----------------|-------------------------------------------|-------|
|                        |        |    |                 | Lower                                     | Upper |
| (post test – pre test) | 22.772 | 96 | 0.000           | 2.513                                     | 2.993 |

Paired samples t-test was used to analyse effectiveness of training . There was significant effect in the scores of post-test (Mean=4, SD=0.651) and pre-test (Mean =1, SD=1.082)conditions;  $t(96)=22.72$ ,  $p=0.000$ . These results suggest that training really does have an effect on MEWScore calculation among in-house doctors at Fortis Hospital, Bengaluru and hence we reject the null hypothesis and conclude that there is an effect after the training and making training effective.

## **10.DISCUSSION AND CONCLUSION:**

### **LIMITATION OF THE RESEARCH:**

The study sample size of 97 is small, so the results of this study cannot be generalised for the other population. Most of the respondents was new to organisation and MEWS protocol. The questionnaire was on scenario-based and lacked detail clinical context and it's difficult to find out cause of error in MEW Score calculation among In-house doctors.

Modified early warning score is a tool used for detection of early deteriorating condition of bedside patients, which can reduce ICU returns and transfers, code blue in the hospital. In our study respondents had no prior knowledge on calculating MEW Score but they were aware MEWS actions and their responses were based on knowledge gained from clinical placement experiences. As per the pre-test results, the average mean is 1. So from here it clearly indicate that need of training is required for in-house doctors. After training post-test results, the average mean is 4. Paired t-test was used to analyse effectiveness of training which showed results  $t(96)=22.72$ ,  $p=0.000$  which rejects the null hypothesis and conclude that there is an effect after the training and making training effective. The overall post-training knowledge among in-house doctors at Fortis Hospital, Bangalore was improved as shown in results. Majority of the doctors have satisfactory knowledge on action taken on MEW Score and MEW Score calculation. Further research is needed to explore the ability among doctors in calculating MEWS and its action to identify physiological and clinical deterioration.

## **AnnexureI**

### **Case scenarios on Modified Early warning score(MEWS):**

- **Please answer all the scenarios, The scenarios are about recordings of vitals of a patients that would be a concern for you to calculate MEWS and for which you will summon more skilled help.**
1. If 60 years old from ER ward with H/O fever O/E- HR 110/min, BP-170/90 mm of Hg, RR 24/min, Temp 101\* F and he is conscious and alert SpO2 94%(RA), what is the MEWS?  
a. MEWS- 5      b. MEWS-4      c. MEWS- 2      d. MEWS-1
  2. If 50 years old male underwent B/L TKR was shifted to ward. He was ambulated with physiotherapy patient complained of chest discomfort. O/E- HR 140/min, BP-70/50mm of hg, RR 40/min, Temp 99\* F and he is alert, SpO2 80%(RA), what is the MEWS?  
a. MEWS- 7      b. MEWS-13      c. MEWS- 11      d. MEWS-9
  3. If 70 years old female admitted to ward after CVA. O/E- HR 60/min, BP-200/110mm of hg, RR 24/min, Temp 98\* F and she is alert, SpO2 94%, what is the MEWS?  
a. MEWS- 2      b. MEWS-4      c. MEWS- 6      d. MEWS- 1
  4. If 40 years old male, ESRD on dialysis admitted to ward with fever and cough. O/E- HR 120/min, BP-180/90 mm of Hg, RR 24/min, Temp 102\* F and he appeared confused SpO2 92%,  
what is the MEWS?  
a. MEWS- 9      b. MEWS- 7      c. MEWS- 11      d. MEWS-10
  5. You are called by nurse to evaluate a patient who was complaining of dyspnoea. Patient had undergone CABG 3days ago. O/E- HR 150/min, BP-96/60 mm of hg, RR 30/min, Temp 98\* F and SpO2 94% his urine output is 100ml, what is the MEWS?  
a. MEWS-9      b. MEWS-10      c. MEWS-12      d. MEWS-8

## Annexure II

### FORTIS – MODIFIED EARLY WARNING SCORE CHART

| PARAMETER               | INFORM       | 3           | 2                                      | 1         | 0         | 1           | 2            | 3           | INFORM |
|-------------------------|--------------|-------------|----------------------------------------|-----------|-----------|-------------|--------------|-------------|--------|
| RESPIRATORY RATE        | <5           | 05-08       | 11-14                                  |           | 16 - 20   |             | 21 - 30      | 31 - 35     | >35    |
| SYSTOLIC BLOOD PRESSURE | <70          | 70 - 79     | 80 - 89                                | 90 - 99   | 100 - 150 | 160 - 170   | >180         |             |        |
| HEART RATE              | <40          | 40 - 49     |                                        |           | 50 - 100  | 101 - 110   | 111 - 130    | 131 - 140   | >140   |
| 6 HOUR URINE OUTPUT     |              | <80         | 80 -120                                | *         | >120      |             |              |             |        |
| CONSCIOUSNESS           | UNRESPONSIVE | PAIN        | AGITATION<br>CONFUSION<br>( New Onset) | VOICE     | ALERT     |             |              |             |        |
| SPO2                    |              |             |                                        |           | 94%       | 90 - 92%    | 85 - 90%     | 84% or less |        |
| TEMPERATURE             |              | 95 For less | 96F - 97F                              | 99F - 99F | 98.6F     | 100F - 101F | 102 For more |             |        |

| TOTAL EWS         | ACTION TAKEN                                                                                                           | ACTION          |
|-------------------|------------------------------------------------------------------------------------------------------------------------|-----------------|
| 0                 | Repeat MEWS at least 8 hourly intervals.                                                                               | A<br>Green Flag |
| 1 to 3            | Increase MEWS to 6 hourly and inform nurse in charge.                                                                  | B               |
| 3 in any one para | -                                                                                                                      |                 |
|                   |                                                                                                                        | C               |
|                   | Inform RMO, Increase MEWS to 2 hourly.                                                                                 | D               |
|                   | Inform ICU Registrar - D / W Primary Consultant. Inform concerned ICU doctor & Primary Consultant                      | Orange Flag     |
|                   |                                                                                                                        | E )             |
| 7 and above       | Inform ICU doctor & Primary Consultant, Immediate call to RMO, Monitor patient every 30 mins, Consider transfer to ICU | F 1 Red Flag    |

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