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Original Article

Internal Medicine Section

Recommendations for Conducting Mortality and Morbidity Meetings Derived from Perceptions of Faculty and Residents, and Qualitative Analysis of Records

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ABSTRACT

Introduction: Even though Mortality and Morbidity meetings (M&Ms) are incorporated into postgraduate training programs for imparting the attributes of self-appraisal, audit and quality control, they are not uniformly structured across institutes. This study describes the pattern of conducting M&M at a Medical College in North Karnataka in the context of the perceptions of faculty and residents of our medical college and proposes recommendations.

Aim: To generate recommendations for conducting structured M&Ms meetings derived from the perceptions of faculty and residents, and prior feasibility experience at a medical college hospital.

Materials and Methods: The present mixed method study was conducted in the Department of General medicine, SDM College of Medical Sciences and Hospital, Dharwad, Karnataka, India, in the month of July 2022. The perceptions of faculty and residents of medicine were obtained by a paper survey. The results of the survey were compiled and analysed by the one of the authors. The responses were matched with the records of M&Ms as conducted in the Department of General Medicine from November 2017 to May 2019. The cases were thematically analysed as deviation from standard protocols of care, multidisciplinary consults, iatrogenic cause of death, unresolved diagnosis and system failure by other authors. Any recommendations recorded were noted. The attendance for such meetings were measured as a surrogate of importance attached. Data was entered in the Microsoft Excel spread sheet. Descriptive statistics were calculated by frequency and proportions for qualitative variables.

Results: A total number of 150 participants (65 were faculty including senior residents and the remaining 85 were postgraduate residents) completed the survey. The participants of the survey preferred the presentation by 3rd year residents and junior faculty. While selecting the cases for M&Ms, they preferred systematic selection turn-wise. The participants of the survey considered that while analysing M&M cases; conflicts in multidisciplinary consults, iatrogenic cause of death, human error and deviation from standard protocols of care should be emphasised. During November 2017 to May 2019, a total of 38 M&Ms were held (19 mortality and 19 morbidity meetings). The criterion for mortality case selection was subjective. Five cases were presented during each meeting. Predominant case presentations included interdepartmental transfer issues and procedural lapses. The Department of General Medicine had 30 postgraduate residents and 25 faculty members. The average attendance of residents and faculty was 90% and 78%, respectively.

Conclusion: Regularly conducted M&M in a medical college hospital are important in training medical students for audit of medical errors, quality control and appraisal in a safe environment. Prospective selection of cases by recognising potential incidents; and evidence based, structured, uniform conduct of M&Ms by participation of teams involved in healthcare can reduce errors.

Keywords: Healthcare quality, Medical audit, Medical errors, Patient safety, Potential incidents

INTRODUCTION

Mortality and Morbidity meetings (M&Ms) are the medical education method that aims to improve patient care and clinical performance by peer review of cases where adverse events are discussed [1]. M&Ms for healthcare providers have shifted in focus from being incident report analyses to being quality control strategy for improving patient safety [2]. Healthcare professionals are affected by the loss of confidence, hesitation to report complications, loss of medical careers, public mistrust and lawsuits due to medical errors. If there is no safe outlet for self and peer appraisal, they may take up defensive practice and suboptimal care [3]. Healthcare organisations hold M&Ms to cultivate a culture of safety that focuses on system improvement by viewing medical errors as challenges [4]. M&Ms have the potential to improve patient outcomes and contribute to the education of healthcare providers [5,6]. The National Medical Commission's postgraduate medical education board of India sets subject specific objectives of postgraduate training in general medicine that should enable the student to undertake audit related to patient care, morbidity and mortality [7]. But methods of conduct of M&Ms are variable in meeting the objective of training the residents [8].

Mortality and Morbidity meetings are limited by cognitive and selection bias in the form of selective case reporting by treating doctors, incomplete disclosure of treatment related complications or witch hunting by hierarchy in institutes [9]. Debiasing strategies to improve self-reflection and respectful audience interaction have been recommended but not uniformly practiced [10].

Methods of selection of cases for M&Ms range from selection by voluntary reporting, by traditional screening for adverse events, presenting all mortalities of the month, random selection out of all mortalities vs systematic selection and coaching the resident, use of electronic trigger tools, and software developed for identifying cases from electronic health records based on important adverse events [11-14]. Case selection is usually made from admitted patients and excludes Outpatient Departments [15]. In surgical M&Ms, a list of minor complications not amounting to

mortality or significant morbidity but which nevertheless cause increase in costs or discomfort are recommended for reporting [16]. Mortality review process could be used to assess care at the end of life also [17]. Prospective collection of data for M&Ms using standardised web-based reporting systems picks more incidents of adverse events in comparison to retrospective collection [6].

The discussion can be based on predecided issues, the summary of which are distributed to the attendees beforehand; or the discussion itself can generate ideas for recognising system failure [2]. The case presentation can be in the traditional story telling format or may invoke prospective disclosure of events with anonymous audience poll regarding plan of their management [5]. The Situation, Background, Analysis and Assessment, Review of literature and Recommendations system (SBAR) is a recommended format for discussion in surgical morbidity and mortality meetings which can be followed by other departments also. It also sets benchmarks for evaluation of M&Ms [18]. Audience poll may also be undertaken to allow the identification and assessment of the multiple causes of complications [9]. M&Ms are recommended to be called Case-Based Error Reduction Conferences (CBERC). New evidence-based recommendations including the use of a standardised taxonomy for classification of errors are proposed [19].

The analysis of errors may be done by Ichikawa (fishbone) cause-and-effect diagram where the factors contributing to M&Ms are assigned to one of the six broad categories: procedure, environment, equipment, people, policy, or other. From these, action plans are derived to identify and implement a concise intervention by designated task forces [20].

Mortality and Morbidity meetings are affected by sociological factors such as perceived vulnerability and power dynamics [21]. The presenters may experience feelings of guilt when presenting medical errors related to patients under their care. Therefore, it is recommended to assign the duty of presenting to a person not managing the patient and inviting the concerned resident to participate from the audience [21]. M&Ms during the recent Coronavirus Disease 2019 (COVID-19) pandemic adopted the virtual platforms which could take away the vulnerability of the presenter [22]. After a M&M, quality improvement can be achieved by explicitly assigning the roles (who, what, how and when) to manage barriers related to execution.

In this study, the records of M&Ms were analysed qualitatively and a survey was conducted to identify whether the expectations of faculty and residents matched the themes derived from the actual conduct of M&Ms. Recommendations were made for conducting structured M&Ms based on present and previous evidence-based reviews.

MATERIALS AND METHODS

This is a mixed method study conducted in the Department of General Medicine, SDM College of Medical Sciences And Hospital, Dharwad, Karnataka, India, in the month of July, 2022. The first part being a paper based survey of the faculty and residents of our Medical College and the second part being a qualitative analysis of the previous records of M&Ms. The records of M&Ms from April 2017 to May 2019 were considered for the study as the records of 2020 and 2021 were expected to be influenced by the redistribution of residents and patients due to the COVID-19 pandemic. Institutional ethical committee clearance prior to the conduct of this study (SDM IEC 248/2019) was obtained. Written informed consent was obtained from all the survey participants.

Two hundred and two faculty and residents of the Departments of General Surgery, General Medicine, Obstetrics and Gynaecology, and Paediatrics regularly conducted M&Ms. Among them 29 residents were appearing for university exams and hence were not available for the survey. A sample size of 150 survey participants was calculated after considering that some would not consent or be available for survey.

Study Procedure

Questionnaire: A set of questions were prepared by the authors in English and prevalidated by six professors from the department of general medicine who were involved in conducting M&Ms by discussion. The prevalidated set of questions was handed out to the eligible participants of the survey. There were six multiple choice questions and two questions of yes or no type [Annexure 1].

Records collection and analysis: In the second part of the study, 38 records of M&Ms meets were analysed as conducted in the Department of General Medicine from April 2017 to May 2019. The power-point slides submitted by each unit were stored in the department computer. The discussions pertaining to each case were written in the M&Ms record book by the presenting resident with remarks by the chairperson. These records were copied and analysed qualitatively. The cases presented were categorised as preventable and non preventable. All the cases were thematically classified by the authors as deviation from standard protocols of care; multidisciplinary consults; iatrogenic cause of death; unresolved diagnosis and system failure by agreement. Non preventable factors were categorised as issues with request for advanced life support; provision of palliation; deviation from standard of care; conflict with relatives and communication gap about futility of care. Any recommendation recorded was noted. The themes derived from the records of M&Ms were matched with the responses of the study participants manually and by agreement among the authors.

STATISTICAL ANALYSIS

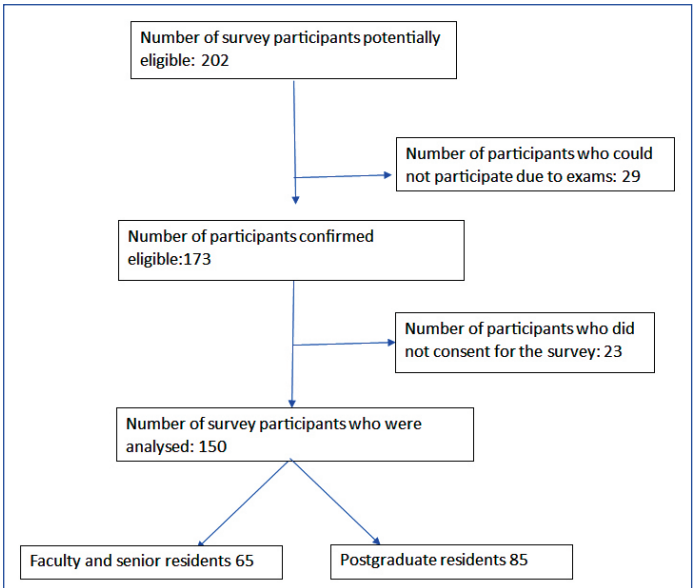
Data from M&Ms meeting records was read by all the authors and common characteristics were identified as perceived by the authors. Similar characteristics were coded using different colored highlighters and common themes were derived. For the survey, the data was entered in the Microsoft Excel spread sheet. Descriptive statistics of the variables were calculated by frequency and proportions. The common responses obtained from the survey were matched with the themes derived from reading the M&Ms meeting records manually. Interpretations were drawn subsequently by agreement among the authors.

RESULTS

Perceptions of faculty and residents regarding M&Ms: The survey questions were handed out to 173 participants. Among them, 88 were faculty including senior residents and the remaining were postgraduate residents. One hundred and fifty responders completed the forms after giving informed consent. Among them, 65 were faculty including senior residents and the remaining 85 were postgraduate residents from various clinical departments as shown in [Table/Fig-1].

There were six statements for each of which there were five right responses. Each response was to be rated by the responders on a 5-point Likert scale from strongly disagree to strongly agree. There were also two statements of true or false type. The following results were obtained from the responses.

The respondents agreed with loss of the doctor's confidence, public mistrust and hesitation to report complications in the future as the consequences of lack of a system for safely reporting medical error.



[Table/Fig-1]: CONSORT diagram.

However, they disagreed with lawsuits and loss of medical careers as the consequences [Table/Fig-2].

The responders strongly agreed with the need for participation of faculty (n=144, 96%), residents (n=124, 82.7%), nurses (n=77, 51.3%) and hospital administrators (n=60, 40%) in M&Ms, but disagreed with participation of other concerned department staff like cross-consultation from super specialties (n=70, 46.7%). The responders strongly agreed with the presentation by 3rd year residents (n=69, 46%) and junior faculty (n=56, 37.3%) but strongly disagreed with 1st (n=117, 78%) and 2nd year residents (n=73, 48.7%) and senior faculty for presenting M&Ms (n=94, 62.7%).

The responders strongly agreed with the selection of cases by reported conflict between patients and doctors and systematic selection turn-wise but strongly disagreed with random selection of cases. They were neutral about trigger tools as selection strategy [Table/Fig-3].

The responders considered conflicts in multidisciplinary consults, iatrogenic cause of death, human error and deviation from standard protocols of care as extremely important while they placed moderate importance to end of life care issues when critically analysing M&M cases [Table/Fig-4].

The responders strongly agreed that important issues in non preventable mortalities were: provision of advanced life support, communication gap about do-not-resuscitate orders and deviation from standard of care while discussing end of life care issues. They agreed with provision of palliation and conflicting views of doctors and patient's relatives as important [Table/Fig-5].

Lack of a system for safely reporting medical error results in										
5-point Likert scale	Loss of doctor's confidence		Hesitation to report complications		Loss of medical careers		Public mistrust		Lawsuits	
	n	%	n	%	n	%	n	%	n	%
Strongly disagree	9	6.0	7	4.7	25	16.7	2	1.3	25	16.7
Disagree	2	1.3	4	2.7	41	27.3	13	8.7	41	27.3
Neutral	39	26.0	23	15.3	39	26.0	20	13.3	39	26.0
Agree	72	48.0	61	40.7	20	13.3	50	33.3	20	13.3
Strongly agree	28	18.7	55	36.7	25	16.7	65	43.3	25	16.7
Total	150	100.0	150	100.0	150	100.0	150	100.0	150	100.0

[Table/Fig-2]: Consequences of lack of a system for safely reporting medical error.

The cases to be presented should be picked up by the following method:										
5-point Likert scale	Voluntary reporting		Trigger tools		Random selection		Systematic selection turn-wise		Reported conflict between patients and doctors	
	n	%	n	%	n	%	n	%	n	%
Strongly disagree	21	14.0	23	15.3	62	41.3	15	10.0	23	15.3
Disagree	24	16.0	0	0	7	4.7	12	8.0	29	19.3
Neutral	34	22.7	56	37.3	20	13.3	21	14.0	13	8.7
Agree	49	32.7	38	25.3	23	15.3	51	34.0	13	8.7
Strongly agree	22	14.7	33	22.0	38	25.3	51	34.0	72	48.0
Total	150	100	150	100	150	100	150	100	150	100

[Table/Fig-3]: Method of selection of M&M cases for discussion.

This type of case should be selected for M&Ms:										
Criteria for critical analysis	Deviation from standard protocols of care		Multi-disciplinary consult		Iatrogenic cause of death		Human error		End of life care issue	
	n	%	n	%	n	%	n	%	n	%
Not important	9	6.0	2	1.3	0	0	0	0	11	7.3
Slightly important	20	13.3	9	6.0	17	11.3	11	7.3	42	28.0
Moderately important	33	22.0	28	18.7	26	17.3	25	16.7	56	37.3
Very important	26	17.3	37	24.7	37	24.7	47	31.3	11	7.3
Extremely important	62	41.3	74	49.3	70	46.7	67	44.7	30	20.0
Total	150	100	150	100	150	100	150	100	150	100

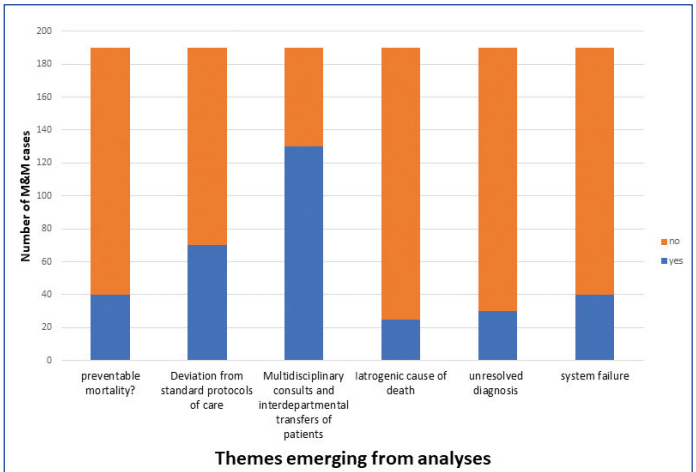
[Table/Fig-4]: Criteria for critical analysis of M&M cases.

This aspect of non preventable mortality should be discussed										
5-point Likert scale	Advanced life support		Provision of palliation		Deviation from standard of care		Conflict with relatives		Communication gap about DNR	
	n	%	n	%	n	%	n	%	n	%
Strongly disagree	10	6.7	6	4.0	2	1.3	14	9.3	0	0
Disagree	11	7.3	12	8.0	25	16.7	18	12.0	23	15.3
Neutral	16	10.7	2	1.3	39	26.0	19	12.7	28	18.7
Agree	47	31.3	66	44.0	35	23.3	55	36.7	36	24.0
Strongly agree	66	44.0	64	42.7	49	32.7	44	29.3	63	42.0
Total	150	100	150	100	150	100	150	100	150	100

[Table/Fig-5]: Criteria for discussion in M&Ms regarding end-of-life care issues.

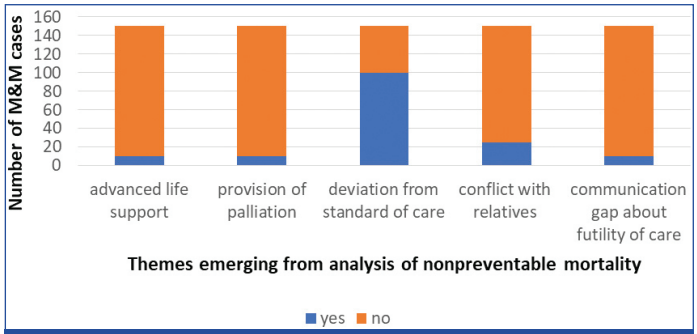
The majority of responders (n=145, 97%) affirmed the need for reporting the contribution of system failure towards mortality. All the responders affirmed the need for arriving at consensus and communicating the consensus statement during subsequent meeting.

Description of the actual conduct of M&Ms: There were total number of 19 M&Ms held during November 2017 to May 2019. Totally 190 cases were presented in M&Ms. Each M&M was for one hour to 1.5 hours. M&Ms were conducted on 1st and 2nd wednesday of every month. Five cases were presented during each meeting attended by the faculty and residents. The Department of General Medicine had 30 postgraduate residents and 25 faculty members. The average attendance of residents and faculty was 90% and 78%, respectively. Cases for M&Ms were selected by the unit chief out of all cases by assessing traditional methods for adverse event surveillance {(e.g., preventable deaths, readmissions within 72-hours, upgrades in care from an inpatient floor to an Intensive Care Unit (ICU) or multiple cross consultations)}. The cases were presented by the 1st year postgraduate residents. The presentations were previewed by the senior residents or assistant professors of the unit. Analysis of cause of morbidity was done considering multidisciplinary involvement, iatrogenic causes, system failure, preventable mortality and unresolved diagnosis subjectively through discussion. Predominant discussions included interdepartmental transfer issues and procedural lapses. Multidisciplinary consults and deviation from standard protocols of care were most often discussed [Table/Fig-6].



[Table/Fig-6]: Analysis of cause of mortality and morbidity during the meetings held during study period.

Analysis of non preventable mortality included request for advanced life support, provision of palliation, deviation from standard of care, conflict with relatives and communication gap about futility of care. Adequate importance was not given to request for advanced life support, provision of palliation, and communication gap about futility of care during the discussion [Table/Fig-7].



[Table/Fig-7]: Analysis of non preventable mortality.

One of the cases presented during the same month was recommended for institutional patient care review where doctors, nurses, laboratory professionals, medical social workers and hospital administrators attended. Conclusions drawn from the meeting were summarised and corrective actions for the future were recommended. Minutes of the meeting were circulated during the subsequent mortality meeting.

DISCUSSION

The focus of M&Ms has been shifted from a review of patient outcome to quality improvement and patient safety by the reduction of systemic errors. The three key aspects of M&Ms identified by Churchill KP et al., are: 1) the careful case selection; 2) the systematic format of discussion during the conference; and 3) the action plan derived from the conference reflecting quality improvement initiatives [2].

In the present study, the case selection was done by unit chiefs after obtaining a list of patients who suffered M&Ms during the previous month. The unit residents provided the list and discussion with unit faculty for presenting at the department level M&M. The residents were guided in preparing the slides for presentation by a moderator. A case presented in the departmental M&M was selected for college level M&M by an independent senior physician by solicitation from department chair. The cases for college level M&Ms would also be sourced from daily incident reports or from feedback from other departments. The case selection was systematic though subjective, considering traditional methods for adverse event surveillance (e.g., deaths, 72-hour return visits with admission, upgrades in care from an inpatient floor to an ICU, repeated multidisciplinary consultations or conflicts with patients). All the deaths or morbidities were not discussed. So, there was a chance of selection bias. Minor complications were not discussed, Outpatient Department (OPD) (ambulatory care/transitioning) patients were not selected, electronic trigger tools were not used. The responders in the survey, including faculty and residents were in favour of systematic selection turn wise

and reported conflict between patients and doctors as a method of selection but did not favour random selection of cases. They were unaware of electronic trigger tools. This pattern was similar to the study conducted by Seigel TA et al., where cases for discussion were identified by an emergency medicine consultant, quality assurance committee, or resident (70%, 57%, and 48%, respectively) [11]. Murayama KM et al., reported that the faculty was in favour of random selection of cases due to perceived need for attendance by all faculty and residents. They thought that it would improve patient care by increasing alertness of residents. The residents were in favour of preselection and guidance by a moderator beforehand as it helped them prepare for presenting and defending their clinical decisions [12]. Chathampally Y et al., provided a list of sources for identification of potential cases and examples of screening categories for potential medical errors [19]. Electronic trigger tools identified patient records from the medical records section and facilitated the review of only those records containing triggers for adverse events unlike the traditional methods mentioned above [13]. Mou Z et al., studied a novel case selection system that included common complications occurring in surgery. These complications were automatically identified in the electronic health records and quality improvement databases. They increased the cases captured for surgical M&M conferences objectively [14].

The M&Ms in the present study followed a pre-established protocol of presentation. In the present study hospital, the M&Ms were conducted regularly twice every month at departmental level and monthly at college level. The department level meetings were attended by faculty and residents (25 faculty and 30 postgraduate residents for general medicine department level meetings) demonstrating interest in need for audit of their patient's mortalities and morbidities. The attendance at department level meeting was 90% by residents and 78% by faculties, respectively. At the college level, the patient care review meetings were attended by faculty, residents of clinical departments and hospital administrators. Concerned nurses and staff from other disciplines attended infrequently. However, the perceptions of the respondents were in favour of the attendance of nurses also. The attendance pattern was similar to the study conducted by Murayama KM et al., [12].

The frequency of conducting M&Ms is not uniform across the globe. Joseph CW et al., mentioned nine studies that reported monthly meetings, six studies reporting weekly meetings, one study each reporting bimonthly and quarterly meetings. In their systematic review, they have discussed that only doctors attended M&Ms in six studies, doctors and nurses attended in eight studies, hospital administrators also attended in nine studies and multidisciplinary teams attended in nine studies [1]. So, the present study recommended the attendance of concerned doctors, residents, administrative officers, pharmacists and nurses at M&Ms. The duration of presentation and discussion for each case averaged 18 minutes for a total of 1.5 hours at the department level meetings and 20 minutes per case for a total of three cases at college level meetings. The evidence regarding the meeting duration varies, with M&Ms going from 20 minutes up to four hours according to Joseph CW et al., [1].

Presentation was usually done by the 1st year postgraduate resident in department level meeting and by the senior resident or assistant professor in college level meeting. However, the responders of the survey preferred presentation by 3rd year residents and junior faculty. Chiang CW et al., studied the M&Ms presented by senior residents [15]. de Vos MS et al., considered presentation of M&M by a resident who was not involved with the care of the patient. This would be to avoid blame and shame during the M&Ms. This approach may however compromise the accountability for patient care [21].

The cases were presented as PowerPoint slides in a grand rounds style. Usually, presentations described the patient's course of illness before and during their hospital stay. Investigations and treatments were described as a timeline of events. The relevant radiological images were presented. There were no audience polls to elicit self-assessment and to reduce vulnerability. Many different approaches to enhance the educational outcome of M&Ms have been recognised. One of them is by interaction with the residents through prospective problem-solving sequential disclosure of events in patient care. At each step the residents were made to commit to a treatment plan by voting. Later after complete presentation, those decisions were justified or quashed [9]. Chathampally Y et al., discussed that in order to improve patient outcomes, the traditional M&Ms need to evolve as quality assurance reviews which focus on error prevention by 'catching near misses before they reach the patient' rather than retrospective error reporting. The process involves designing screening tools for potential medical errors in emergency department, recognising potential sources for case identification like institutional or departmental reporting registries, feedback from other departments, patient complaints and medical staff reporting among others. They have provided evidence-based guidelines to improve M&Ms while renaming them as CBERCs [19]. The departmental and institutional M&M method used in the present study was not different from the evidence-based guidelines mentioned but for the prospective incident reporting.

The discussions were aimed at clinical reasoning leading to arriving at the cause of the adverse event. Analysis included predominantly multidisciplinary consults and deviation from standard protocols of care. However, here the responders placed importance to iatrogenic cause of death and human error. But no specific tool such as Ichikawa fishbone model or root cause analysis or mind map was used for analysis. Ichikawa fishbone model is an analytical tool that considers people, environment, procedure, policy, equipment or others as contributing to adverse outcomes [20]. Joseph CW et al., summarised similar pattern of presentation in their systematic review [1]. Murayama KM et al., have described a mismatch between the satisfaction of residents and faculty regarding the style of presentation at M&Ms wherein the faculty expected the grand rounds style of presentation with research of the relevant literature but the residents preferred short and multiple on-the-spot discussions that were educative and addressed common minor and simple complications also [12]. There are newer frameworks like the SBAR (situation, background, assessment, recommendations) framework which are introduced for surgical residents which may also be adapted by the general medicine M&Ms. These may aid in standardising M&Ms in India also [18].

End of life care and palliation were not sufficiently discussed in our M&M meetings in spite of importance attached to them in the survey. This reflects the predominantly curative approach of training the doctors. Pekmezaris R et al., showed that a systematic mortality review process could be used to assess care at the end of life also [17].

Usually there was no review of relevant literature. System failure issues were discussed and informed to the hospital administration in our study and were affirmed as important by the responders. The M&Ms of the present study ended with summarising the discussions but usually a consensus statement was not made and communicated during the subsequent meetings. Generally,

inferences were drawn by senior opinion leaders at the end of the M&Ms and there was a possibility of hierarchical bias. A study used electronic voting for arriving at a consensus and demonstrated its effect in reducing hierarchical bias therefore empowering the whole audience [10]. Beaulieu-Jones BR et al., compared advantages and disadvantages of in-person and video MMC through a survey during COVID-19 pandemic. They inferred that the residents were less stressed during video M&Ms and there were no room constraints. But the common advantages for conducting M&Ms in-person were more interactive discussions, fostering community within department; and public speaking practice [22].

Chiang CW et al., also noted that resident physicians rate M&Ms less positively than faculty, citing blame culture rather than targeting change. A very important observation in their study was that quality control conference could include outpatient morbidity discussion also [15].

The responders of the present study agreed with arriving at a consensus and communicating the consensus statement during the subsequent meeting. The respondents in this survey did not consider lawsuits and loss of medical careers as the consequences of lack of a system for safely reporting medical errors. This may well be blissful unawareness since there are increasing numbers of lawsuits against doctors everywhere in the world [3,4]. There may be a need to train doctors for anticipating such a possibility.

The following pattern for M&Ms meetings was recommended by the authors:

- Each teaching unit maintains an incident report book for noting cases that had hospital acquired infections, complications due to system failure or communication failure, iatrogenic complications, deviation from standard of care and conflicts with patients. This book shall be updated on a daily basis.
- At the end of the month all the deaths should be reported and screened for any match with the incident report. Such cases should be selected for discussion.
- All the deaths and morbidity should also be screened for prolonged hospital stay more than one week, multiple readmissions, re-admissions in 72 hours of discharge, more than two interdepartmental consultations, and shifting back from general wards to intensive care. Such cases should also be selected for discussion.
- All the residents, faculty, concerned nurses, infection control committee representatives, pharmacists and hospital administration representatives should attend the meeting.
- Presentation should be done by a final year resident or junior faculty member.
- The timeline of patient's course of hospital should be sequentially revealed and at each step, the clinical decisions of the residents and faculty should be elicited by electronic voting as in a problem-solving exercise. This should be followed by revealing the actual patient care provided.
- The cases should be analysed as per the Ichikawa fish bone cause-and-effect analysis format.
- Error taxonomy should be adopted.
- The chance to disclose errors without fear should be provided.
- Brief review of literature should be done
- Learning points should be decided by consensus.
- The consensus statement should be recorded in passive voice and read as minutes of the meeting during subsequent M&M.
- System failure and steps to mitigate should be communicated with hospital administrators. Task force should be made to rectify system errors and periodically evaluated.

Limitation(s)

Since the second part of the study was a qualitative analysis made by the authors themselves, there was a possibility of bias. However, the deeper aspects of M&Ms meetings such as perceived vulnerability and power dynamics can be studied by qualitative method.

CONCLUSION(S)

Mortality and Morbidity meetings are being regularly conducted in the medical college hospitals. They are important in training of medical students and help in quality control. It was intended to incorporate the changes perceived as important and agreed upon by the survey participants. Thus, framing evidence-based, structured, uniform guidelines for conducting M&Ms were recommended and for error reduction by recognising potential incidents even before the occurrence of the trigger events.

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[ANNEXURE 1]: MORTALITY AND MORBIDITY (M&MS) REVIEW AS POSTGRADUATE EDUCATIONAL STRATEGY

1. Lack of a system for safely reporting medical error results in: 1-strongly disagree; 2-disagree; 3-neutral; 4-agree; 5-strongly agree

Loss of doctor's confidence	Hesitation to report complications	Loss of medical careers	Public mistrust	Lawsuits

2. The following persons should participate in M&Ms: 1-strongly disagree; 2-disagree; 3-neutral; 4-agree; 5-strongly agree

Faculty	Residents	Nurses	Hospital administrators	Other concerned department staff

3. The following persons should present M&M: 1-strongly disagree; 2-disagree; 3-neutral; 4-agree; 5-strongly agree

1st year PG	2nd year PG	3rd year PG	Junior faculty	Senior faculty

4. The cases should be picked up for M&Ms in our department by the following method: 1-strongly disagree; 2-disagree; 3-neutral; 4-agree; 5-strongly agree

Voluntary reporting	Trigger tools	Random selection	Systematic selection turnwise	Reported conflict between patients and doctors

5. This type of case should be selected for M&Ms: 1-not important; 2-slightly important; 3-moderately important; 4- Very important; 5-extremely important

Deviation from standard protocols of care	Multidisciplinary consult	Iatrogenic cause of death	Human error	End of life care issue

6. This aspect of nonpreventable mortality should be discussed: 1-strongly disagree; 2-disagree; 3-neutral; 4-agree; 5-strongly agree

Advanced life support	Provision of palliation	Deviation from standard of care	Conflict with relatives	Communication GAP about DNR

7. Contribution of system failure towards mortality should be reported to hospital administration after M&Ms.

Yes/no

8. Consensus statements of M&Ms should be agreed upon at the end of meeting and read in the subsequent meeting as minutes.

Yes/no