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"Mayhem Room" As an Educational Approach to Teaching Patient Safety, with Thematic Analysis and Qualitative Inputs from The World Academic Council in Emergency Medicine (WACEM)

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Abstract

The concept of the "Mayhem Room" (MR) refers to any room or space which is curated with Patient Safety (PS) lapses, with an objective to be used as an educational approach in teaching PS. It is a low fidelity room set-up, which resemble exactly the ward, hospital room, emergency department resuscitation room or Intensive Care Unit (ICU) room. The arrangement of the furniture and equipment will depict what these actual rooms look like, except for the lapses and errors to be inculcated. Any permutation and combination of errors can be incorporated. These would be considered intentional errors which are "staged" for the individuals or teams entering the room to identify. This is a form of active learning which is immersive and experiential. It also assesses the observational skills and acumen, as well as situational awareness. The MR can be an individual or group activity to practice critical thinking and also to look out for latent threats. When done as a group activity, the learners can interact and discuss their observations, decisions and also cover each other's blind spots. MR simulation can be an effective initiative to be integrated into

inter-professional education in PS. It represents a novel technique to inculcate awareness and help healthcare workers be alert to their surroundings as well as anticipate risks. The MR can also help teams learn to "Speak Up" and address their concerns. It can be customized for various PS learning objectives:

- General or specific PS focus
- Clinical processes
- Clinical procedures
- Medication delivery, medication errors
- Documentation lapses and issues
- Healthcare associated infection and infectious issues
- Communications failures and lapses
- Sub-standard care delivery, involving pathways or inter-professional care teams
- Patient accidents and falls
- Nutrition errors (eg. Wrong diet for a Diabetic patient)
- Cultural aspects of care and environment
- Others

We share the perspectives of using the MR from Singapore and New Zealand members of the World Academic Council in Emergency Medicine (WACEM).

Introduction

Patient safety (PS) is a theme that cuts across all disciplines, departments, institutions and, must be at the core of healthcare delivery systems. It should not be incorporated as 'second thought', but must be mainstreamed right from the conceptualization and planning stages of healthcare institutions and healthcare programmes. PS initiatives embedded into the curriculum must be applicable, practical and impactful; from the undergraduate levels, into residency and post-graduate training, and eventually as a part of practice for faculty and practitioners [1-5]. All levels of healthcare staff must receive PS training and reinforcements as relevant. There are numerous educational approaches used today to inculcate and nurture principles of PS. However, the quest for the most impactful and best way to teach PS with sustainability (in terms of practice) is still being sought. The right approach is probably to customize the educational approach used, and match the learning objectives with the learner groups to meet their needs. These methodologies can then be embedded into the curriculum of medical schools, residency training programmes and faculty development courses. These training must include the practical training besides just the didactic forms of learning [4, 6-10].

Discussion

PS learning initiatives are often also tied to or coupled with situational awareness training. Both these components are critical to help reduce and prevent hospital acquired harm towards patients [11, 12]. Whilst today, there are many partners working in PS; including patients, families, the public and community, the spectrum of healthcare providers and organizations, they cannot be the substitute for the proper and conscious vigilance of all staff in playing their roles to upkeep PS. PS related educational materials are also adapted to incorporate the latest, integrate customized strategies that increase the understanding, clinical reasoning and judgment. It is time to go beyond just the traditional forms of PS education [1, 7, 8, 13-16]. Some of the educational approaches that have been tried in PS education include interactive lectures, use of educational and instructional videos, online learning modules, face-to-face practical training for modules such as hand hygiene and donning/ doffing of Personal Protective Equipment (PPE), case-based discussions, scenario-based learning and simulation-based learning [4, 6]. Simulation-based learning is a technique which is now very widely used across many disciplines [14-21]. It is also becoming well embedded in PS training and education. (Table 1) The modalities and simulation tools used for PS training is many and varied. In this paper, we are sharing the concept of utilizing "The Mayhem Room", a low fidelity simulation to help create awareness, understanding and inculcate the right practices in relation to PS [22-28].

The "Mayhem Room"

In our day to day workplace and environment, hazards

Table 1: Simulation-Based Learning Spectrum

Simulation-Based Learning and Education
For common 'bread and butter' cases (for practice familiarization)
For rare and less common cases (to practice and keep updated)
For testing out work flow processes (including systems factors)
For checking out latent threats
For streamlining clinical care pathways (use of sequential simulation)
For Human factors enactment and studies
For patient safety initiatives (to contextualize), including the "Mayhem Room" technique

exist. Some of these are obvious and overt whilst others are un-noticed, un-discovered and thus, remain uncorrected. Many of these are linked to lack of situational awareness in observing and perceiving the work environment. These can result in gaps in our duty to take care for our patients and protect them from PS lapses. The word "Mayhem" has a generic meaning of violent, extreme disorder or chaos. The "Mayhem Room" (MR) refers to any room or space which is curated with PS lapses and issues, with an objective to be used as an educational approach in teaching PS. It is a low fidelity room set-up, which resemble exactly or very closely, the ward, the hospital room, the emergency department resuscitation room or Intensive care unit room. The arrangement of the furniture and equipment will depict what these actual rooms look like. In the set-up of these rooms, any permutation and combination of errors can be incorporated. These would be considered intentional errors, depicting lapses in elements of PS. They are "staged" for the individuals or teams entering the room to identify or decipher PS elements and lapses [22-24]. This is a form of active learning which involves looking for all the potential errors and lapses within the MR. The activity is immersive and experiential. It also assesses the observational skills and acumen, as well as situational awareness. The MR can be an individual or group activity to practice critical thinking and also to look out for latent threats. When done as a group activity, the learners can interact and discuss their observations, decisions and also cover each other's blind spots. Afterall, healthcare today, is not a solo endeavour, but interdependent practice by inter-professional healthcare staff [23, 25-28]. MR simulation can be an effective initiative to be integrated into inter-professional education in PS. It represents a novel technique to inculcate awareness and help healthcare workers be alert to their surroundings as well as anticipate risks. The MR can also help teams learn to "Speak Up" and address their concerns [26-28].

The MR simulation can be customized for various learning objectives pertaining to PS. Some of these would include:

- General or specific PS focus
- Clinical processes
- Clinical procedures
- Medication delivery, medication errors
- Documentation lapses and issues
- Healthcare associated infection and infectious issues
- Communications failures and lapses
- Sub-standard care delivery, involving pathways or inter-professional care teams
- Patient accidents and falls
- Nutrition errors (eg. Wrong diet for a Diabetic patient)
- Cultural aspects of care and environment
- Others

This can also be planned according to the World Health Organization (WHO) incident types, ie. Clinical process and procedures, documentation, healthcare-associated infection, medication and intravenous fluids, nutrition and patient accidents [29, 30]. The performance in the MR is also strongly linked to situational awareness levels, as well as the understanding of PS elements and practices.

The Mayhem Room Activity

i. Preparation for the Mayhem Room

Upon conceptualization of the idea, the scenario can be crafted accordingly. The ideas for this can spark off from previous PS lapses, Root Cause Analyses and Serious Reportable Events cases as well as other experiences [31]. The scenario can be vetted by individual professions or inter-professional groups as relevant, such as representatives from the individual wards, cultural liaisons, and safety officers so that all can provide their inputs, these will be guided by the learning objectives. Characteristics such as the demographics of patients, special precautions, error prevention or hazards of various nature can be planned [32]. An example of the room set-up can be seen in Table 2. Deliberate introduction of risks and hazards can be curated based on the frequency of the incidents happening, need for education and behavioural change [3, 5, 33-34].

The location of the MR can be any suitable room, such as the ward, intensive care unit room, resuscitation room or a simulation laboratory converted as needed. The set up can be designed accordingly. One advantage of conducting the MR exercise in a simulation laboratory is that the faculty can watch the performance from behind the one-way mirror and follow the team's conversation and train of thinking as well as watch the team members' interaction. The environmental set-up, the equipment required, the use of a mannikin or a standardized patient must all be decided. Conducting a dry run to test out the MR is also useful, just like in other simulation activities [8, 20].

ii. Execution of the MR Activity

After the preparation and confirmation of the learner

Table 2: The Mayhem Room features a manikin as the patient for emergency training.

Mayhem Room Set Up with Mannikin as the Patient
Door left ajar, but with sign "INFECTION RISK" pasted on the outside of door
No PPE provided outside the door
Bed position extremely high/ low
Manikin is elderly, but no "Fall Precaution" sign at the bed
Cord side is down on one side of the bed
Torniquette left on patient's arm, the arm may look blush/ dusky
Patient has allergy, but red wrist tag missing (will paste Allergy alert on the wall behind patient's bed)
Bed linen soiled with blood in several obvious places
Call bell not near patient/ out of reach
Urine bag dangling and touching floor
Dressing on chest not occlusive and messy with blood stains
Chest tube kinked
Place a pair of scissors on patient's bed
Staff's coffee mug on patient's side table (stick doctors name on it)
On patient's side table: kidney dish with open needles, tubes with blood, few loose tablets lying around
No sharps disposal container
IV infusion not labelled, can have a few infusion with tangled and crossed tubing
Put a sign "OUT OF ORDER" on the sink

groups as well as the learning objectives, the execution of the activity commences with a pre-briefing. Instructions will be shared and the participants will be told what is expected of them, the time line, whether they are required to write down all the errors and hazards as well as other relevant information. The reinforcement that this is a safe space for their learning is also important in order to maintain psychological safety. Some centres require consent prior to participation and for video recording.

iii. **The Debriefing**

Depending on whether the MR activity is an individual or group one, debriefing will be done accordingly. In principle, any debriefing model is applicable. Faculty can use whichever model they are familiar with. Reference to video can be used if needed. Some may choose to return to the MR to point out the hazards and errors. This is especially useful in cases where the hazards are rare or challenging to pick up. In controversial situations, going back into the MR is also beneficial and the learning value can be more impactful. Commonly missed errors can also be highlighted and discussed. At the same time, the corrected action or the rightful way of doing things should be shared as well. For novice groups such as medical and nursing students, 'micro-debriefing' can be utilized as participants may be less familiar and need more explanation and demonstration which can be done by the faculty during these short interval debrief before the terminal debrief [33, 34].

In the following section, we will share some WACEM member countries' perspective and experience with MR.

The SingHealth (Singapore) Experience with The Mayhem Room

The MR activity was conducted at a Masters in Patient Safety and Quality course recently. It was a pilot involving 15 masters students from inter-professional background. The objectives were:

a. To observe the inter-professional teams performance (including inter-professional interactions) on the identification of hazards/ risks

b. To understand the teams' subjective experience of the activity (thematic analysis)

The trial MR was set up with errors/ hazards as in Table 2. The participants of the course represented the active learners in the MR. As they were relatively senior healthcare staff, the activity was used as a demonstration for them to understand and see how they can in turn use it in future to train their own colleagues. They were also told that the high reliability part of using this activity pertains to the situational awareness, the continuous monitoring in clinical practice and remediating the risks, when these happened.

This activity was conducted in a simulation laboratory which enabled the faculty to view the teams performance and interaction from behind the one-way mirror. Some errors were easier to identify compared to others. Some were more obvious to nurses rather than doctors/ allied health professionals. This shows how inter-professional teams can cross-cover each other's deficiencies in knowledge. The 15 healthcare professionals feedback was also analyzed, using a thematic analysis approach and these were grouped into three categories, as in Table 3. The steps of the thematic analysis included:

1. Familiarization, 2. Generating themes for coding, 3. Reviewing the themes, 4. Defining and naming the themes collated and 5. Coming up with the final report (Table 3)

Table 3: Thematic Analyses Themes of Participants' Subjective Inputs

Educational perspective:
Gaining new knowledge
A new environment for learning about patient safety
Realistic and engaging learning environment
Non-judgmental space
Enjoyable way to learn and use to teach patient safety
Learning method is able to create greater consciousness about patient safety
Simulation education can be fun and easy to execute, but very helpful
Good attention to details
Can help create greater awareness of the environmental factors relating to patient safety
Some of the errors/ hazards are often taken for granted by staff
Good form of peer learning
Good for testing situational awareness
Learners feel psychologically safe
A mechanism to introduce cultural awareness
Inter-professional Collaborative Practice and Teamwork:
Good to work together as some errors/ hazards are more obvious to nurses
Different professions have different perspectives
Each profession has their area of expertise and strength
Work processes and environmental factors are inter-connected in IPCP work
Good to inculcate team spirit
Useful activity for teams training in patient safety
Good demonstration that teams cannot work in silos
Important to respect inter-professional team members
Emphasizing the concept that safety is everyone's responsibility
Other Inputs:
Pre-briefing prepares the team to look for errors. If they are not told, it may be more exciting
Teams may have to organize themselves to cover all aspects of the MR so as not to miss the hazards eg. Team members may be allocated segments of the room. Role allocation can be utilized.
Can plan a systematic approach by the learners/ teams
Can help build communications and understanding skills in the teams
Good activity to train for "Target Zero Harm"
Not time consuming to execute as a learning activity for patient safety

Application of the Mayhem Room Concept to Patient Safety Work

The MR is a curated setting for learning. In practice there is already something similar known as "The Gemba Walk". This is where PS teams do a round or a walk-through the department or ward to make observations of errors, lapses and things that can be changed for the better or improved. It is essentially a walk-though of work processes and environmental arrangements. Gemba walk is a form of lean technique which started off with the intent to gather information on how work is performed [35]. The spin-off to look at patient safety and quality related issues in real time during the 'walk' has now become useful in many industries, including healthcare settings. It can also be easily customized to the appropriate clinical setting and helps create a PS ecosystem in the department. The 4 important considerations in Gemba Walk are:

A. The location

B. The observation process

C. The teaming or interaction and

D. The Reflection

These 4 elements are really what we have to do when critically looking out for hazards/ errors. The Gemba Walk is not curated, whilst the MR is planned with intentional errors/ hazards with a view for learning. Both these techniques support the concept of a department or organization being "high reliability", with hands-on expertise rather than just rank or profession [35, 36].

The New Zealand Experience with The Mayhem Room

In our simulation centre we have created a "Game of Errors," and advertised it similar to the popular TV series of a similar name. We have set up a room that is cordoned off that allows participants to enter and interact with the room to evaluate and identify the risks and errors found but are not able to touch anything in the room. The room is kept open for 2-4 weeks and is held as a "competition" for all staff members including all students, medical, nursing, allied health, cleaning, security, and clerical staff to promote that safety is everyone's responsibility. Participants are given a sheet to document the errors found and describe them. At the end of the "run" of the room, the winners are given coffee vouchers as prizes. The room is altered quarterly to represent different wards. The room is set up in consultation with staff members of the individual wards represented, patient safety officers, and cultural liasions from our Māori and Pacifica departments. We have been able to introduce the Maori concept of Tikanga Māori - cultural authenticity into the design of the room where appropriate. Findings are taken back to the individual wards for evaluation, remediation, and education as necessary. We have found that staff have been engaged and interested in the game. We have also had

feedback that there is increased awareness and correction of simple errors like bed heights and bed rails being pulled up, rubbish picked up off the floor, and notification of the the appropriate staff member to address a specific concern.

Experience with the "Mayhem Room" concept in Morocco

In Morocco, although we are familiar with the internationally known "Mayhem Room" concept, we have developed a similar approach adapted to our context, under the name of "chambre d'erreurs or errors room". This concept, which we integrate into educational activities in the health sciences, is a tool for reinforcing practical learning and critical thinking among students and healthcare professionals. It is a one-to-one learning activity where participants work alone to identify, analyze and correct errors deliberately integrated into clinical scenarios. The emphasis is on developing individual decision-making, analytical skills and the ability to recognize and manage critical errors in a safe environment.

This teaching method mainly targets students in the health sciences, particularly emergency medicine and onco-hematology. Occasionally, the errors room is also organized for continuing education, notably at learned society congresses.

Key Observations and Results

Popularity and effectiveness: These activities are highly appreciated by participants. Feedback consistently highlights their engaging and immersive nature, motivating learners to participate actively. Quantitative evaluations show a significant improvement in knowledge and skills, as evidenced by the marked difference between pre- and post-test results.

Satisfaction levels:_Participants frequently report high levels of satisfaction with these activities. They find them both fun and hard-hitting, offering an alternative to traditional teaching methods and providing hands-on experiences that replicate real-world challenges.

Difficulties of institutional adoption: Despite their proven pedagogical value, these methods are not yet institutionalized in Morocco. They currently rely on the initiative and dedication of volunteer trainers, who design and run these sessions without formal structural or financial support.

Need for training of trainers: To ensure the sustainability and expansion of these activities, it is crucial to set up structured train-the-trainer programs. Developing a network of qualified facilitators capable of implementing these methods with confidence is essential. This would enable wider adoption across universities and healthcare establishments, to benefit a greater number of students and professionals.

Conclusion

In conclusion, although the Chamber of Errors has proved to be an innovative and effective educational tool in Morocco, its widespread adoption faces challenges. These include the lack of institutional support and the need to develop dedicated train-the-trainer programs. Nevertheless, high satisfaction rates, observable learner progress and positive feedback underline the value of these methods. With adequate investment in resources and facilitator training, these activities have the potential to transform health education in Morocco, making it more dynamic, interactive and adapted to the challenges of modern clinical practice.

Final Conclusion

The Mayhem Room represents a fun, stimulating and immersive learning activity which is easy to execute. It is both low cost and low fidelity. It can be customized as needed for different groups of learners and for different objectives, including inter-professional collaborative practice training. It is a relevant tool to help plan patient safety initiatives and interventions. It also highlights the benefits of simulation-based learning; repetitive, deliberate practice, with no harm to real patients. Moving ahead with the MR concept, learners can:

A. Identify and mitigate patient safety hazards

B. Familiarize themselves with event reporting

C. Be more conscious of team skills, when addressing PS issues.

It can inculcate and strengthen PS knowledge and practices, whilst maintain psychological safety [37]. The concept may not be well known or utilized in some countries, thus it is hoped that this paper can help to create greater awareness of this easy to execute, relatively cheap and cost-effective technique to help enhance PS training.

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