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Review Article

Future-Proofing Patient Safety Initiatives: Applying Simulation Guided by The WHO Global Patient Safety Action Plan 2021-2030

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Abstract

The World Health Organization (WHO) has published a document, which sets the strategic directions for concrete actions to be undertaken by countries, partner organizations, healthcare institutions and the community, as an essential foundational step in building, designing, operating and evaluating the performance of healthcare systems pertaining to patient safety. The document is the "Global Patient Safety Action Plan (GPSAP) 2021-2030: Towards Eliminating Avoidable Harm in Health Care". It strategically shares a 7X5 matrix on the framework for Patient Safety action role out and execution. Simulation is making major inroads in the area of education and training, which can be applied to Patient Safety. It is a powerful tool that can be integrated into the 7X5 matrix framework and help with planning, testing, refining and reviewing programmes, initiatives, clinical pathways and workflow. The Patient Safety Curriculum Guide by World Health Organization now emphasizes simulation as an integral part of any Patient Safety Curriculum. This paper summarizes how simulation can be integrated proactively, using the matrix as a 'live document' to guide institutions in maintaining the robustness, dynamism as well as future-proofing their Patient Safety initiatives.

Introduction

Even as patient safety features as a core component in many healthcare matrices, it remains a domain that needs further uplifting and prioritization within the health agenda of many countries. There are certainly challenges with respect to the planning, initiation, execution, sustainability, and achievement of good buy-in for Patient Safety initiatives. Issues such as lack of awareness, lack of engagement and ownership, insufficient support from leadership and management, staff resistance to change, already overloaded curricula for healthcare professions with a focus on content-based learning, and other competing workplace priorities all contribute to these challenges [2, 3]. The bottom line has to be that the learning culture must emphasize safety, and appropriate resources must be provided. In response to these ongoing concerns, the World Health Organization (WHO) published a document that sets the strategic directions for concrete actions to be undertaken by countries, partner organizations, healthcare institutions, and the community, as an essential foundational step in building, designing, operating, and evaluating the performance of healthcare systems pertaining to patient safety.

Discussion

The document is the "Global Patient Safety Action Plan (GPSAP) 2021–2030: Towards Eliminating Avoidable Harm in Health Care". It strategically presents a 7×5 matrix as a framework for Patient Safety action rollout and execution. (Figure 1) [1, 2] The GPSAP represents an umbrella framework that can be used as a guide for institutions to develop, or countries to plan, their own patient safety strategies. Local customization and adaptation are encouraged in order to address local issues and unique cultural practices as deemed necessary. In a survey based on the GPSAP, Patient Safety leaders from eight Asia-Pacific countries (Singapore, Malaysia, South Korea, India, Sri Lanka, Indonesia, Nepal, and Maldives) were polled [3]. Interestingly, the results demonstrated substantial differences in perceptions of Patient Safety practices across healthcare facilities and faculties, based on the strategic objectives of the document [3]. Surveys of this nature can certainly present opportunities for countries to promote equity and sustainability, as well as improve Patient Safety culture and systems. WHO has also established The Global Patient Safety Observatory for member countries to measure their individual performance and progress in achieving the goals and strategic objectives of the GPSAP [4]. The GPSAP was conceptualized with the vision of creating a "world where no one is harmed in healthcare, and every patient receives safe and respectful care, every time, everywhere" (WHO's vision) [1]. Institutions can use it to advance their mission in [5]:

- Patient Safety initiatives, programmes, and relevant curriculum
- Patient Safety research
- Implementation and strengthening of Patient Safety culture
- Reporting and best practice guidelines
- Patient Safety partnerships

In today's rapidly evolving world, where technology increasingly intersects with healthcare, institutions must also review [5, 6]:

- More efficient delivery and execution of Patient Safety initiatives
- How technology is utilized and integrated with human elements
- Challenges within the healthcare environment and healthcare workforce
- Embedding psychological safety and "safe spaces" for healthcare workers [6]

Figure 1: The 7 X 5 Matrix: WHO Framework for Action in Patient Safety (World Health Organization (WHO). Global patient Safety Action Plan.

As healthcare systems evolve – particularly with rapid technological advancement – institutions must ensure that patient safety initiatives remain adaptable, sustainable, and future-proof. Simulation offers a uniquely powerful modality to achieve this. It enables safe, iterative testing of systems, enhances workforce competence, supports interprofessional collaboration, and provides a structured method for identifying latent threats. This paper proposes a conceptual framework for integrating simulation into the operationalization of WHO's GPSAP 2021-2030. Simulation should no longer be regarded merely as an educational tool but rather as a continuous organizational learning engine that supports and future-proof adaptive patient safety systems, implementation science and high reliability healthcare practices.

Safety-Science Perspective on Simulation

In enhancing patient safety measurement and management, the Safety I and II frameworks can be useful for departmental utilization and tracking purposes:

Safety I and Safety II Models: Safety I is the traditional model of viewing adverse events as deviations from safe operations. This system relies on identifying and learning from failures and developing strategies for harm-reduction. The focus is on errors, incidents, adverse events and root cause analysis [7]. Safety II recognizes healthcare as a complex, adaptive system. It acknowledges resilience, adaptation, impact of real-world conditions and pressured environment [7]. Simulation supports both Safety I (avoiding harm), and Safety II (ensuring things go right) by enabling teams to practice adaptive capacity, anticipate variability, and strengthen system resilience [7].

Human Factors: *This* scientific discipline examines how humans interact with systems, environments and technologies. In the area of patient safety, human factors approach provide a structured process to understand why errors occur, how systems shape behaviours, and how design can reduce risk [8-10]. Simulation naturally incorporates principles of human factors into training by emphasizing:

- Design and Execution Gap – Simulation exposes this gap by revealing real-world adaptations, workarounds, and latent threats.
- Cognitive Load and Situational Awareness – By allowing individuals or teams to practice managing complexity, interruptions, and time-pressure.
- Shared mental models & Communication – Structured debriefing supports shared mental models, clarifies roles, and strengthen non-technical skills such as leadership and followership.
- Workflow Optimization – In situ simulation enables assessment of geographical and equipment layout, environmental constraints, and process flows.

Implementation Science – Implementation science focuses on how evidence-based practices are adopted, adapted, and sustained in real-world settings. Interventions may fail not because they are ineffective but because they are poorly implemented, insufficiently tested in context, or are not supported by end users [11-14].

Simulation offers a method to operationalize implementation science principles by [12, 13]:

- Testing interventions before deployment – Allowing for the testing and piloting of new protocols, pathways, technologies, or updates to existing ones.
- Enhancing fidelity and standardization – Particularly if new practices are introduced across teams, resulting in reduced variation and reinforcing the shared mental model.
- Supporting behavioural change – Through deliberate practice, immediate feedback, psychological safety, and opportunities to rehearse before embedding changes.
- Enabling quality improvement measurement – Simulation enables rapid Plan-Do-Study-Act (PDSA) cycles, allowing teams to test, refine, and retest interventions, and then generate data on feasibility, acceptability, applicability, and workflow integration.
- Supporting sustainability – Organizations can create ongoing opportunities to refresh skills, reinforce new behaviours, and monitor drift from intended or expected processes.

Future-proofing Patient Safety Practices

Future-proofing refers to the process of designing systems, products or strategies that remain useful, successful and applicable despite future changes, technological advances and environmental shifts [15, 16]. The key elements of focus for future-proofing will include:

a. Adaptability and flexibility: this is where the infrastructure of the program or initiative can be changed or readily adapted to new developments. Having a modular approach can be useful for future modifications

b. Longevity and durability: incorporating high standards and quality from the beginning is fundamental. Applying solid, accepted principles will help ensure this. Proper implementation using technology may also help with longevity, as it may eventually cost less when needed to be upgraded.
c. Anticipation: this is where we think forwards and identify potential risks and disruptions. This would mean we can plan how to address them expeditiously in the current or future iterations.
d. Proactive strategy: this would include extensive literature search and knowledge of the interventions, frequent surveillance and monitoring to keep abreast and ensure sustainability in the longer term.

Therefore, to future-proof patient safety initiatives, they must be [16-19]:

i. **Designed using robust educational principles** such as deliberate practice, simulation-based learning, and experiential learning.
ii. **Easily modifiable** when new evidence emerges, allowing rapid updates without compromising foundational intent and principles
iii. **Implemented with an understanding of human behaviour and human-factors science,** including the Hierarchy of Intervention Effectiveness [20], ensuring that interventions are targeted rather than reactive.

Simulation and Patient Safety

Simulation refers to a technique (not technology), to replace or amplify real world experiences and practice [21]. Today, it is widely used in education, assessment (both low and high stakes assessment) as well as many other practice applications and training. It has been used to inculcate knowledge, skills and behavioural changes through training. It can help fine tune workflow processes, clinical pathways, assessment for latent threats and with interprofessional teams training [22, 23]. The development of simulation-based practices has expanded exponentially in the last decade, to reach a state where it is possible to say "if you can conceptualize it, it can be simulated". There is also increasing evidence that healthcare simulation contribute towards patient safety training and initiatives implementation. Simulation is used today to enhance workforce competencies, improve systems processes, identify latent threats, strengthen teamwork and collaboration and support strategic objectives to reduce avoidable harm [24, 25]. Importantly, simulation has also been used for stress management, particularly in high-acuity settings. It is well known that the stress and burnout experienced by healthcare personnel during clinical practice are factors that threaten patient safety. Therefore, minimizing stress that may impair healthcare staff performance during the management of complex cases is of critical importance [23-25]. The use of simulation is now moving beyond just training individuals learners, to teams training (inter-professional collaborative practice), systems and organizational type training. Simulation is also used in governance and leadership training, operations and preparedness planning as well as human resources management. With the widespread adoption of simulation and its integration into nearly every field, the spectrum of equipment and tools used for simulation delivery and integration into educational armamentarium has expanded considerably (Table 1). These diverse approaches can be incorporated into patient safety programs and initiatives, making training more stimulating and engaging for both learners and practitioners [24, 26-29].

Table 1: Overview of simulation tools and applications for patient safety training.

Spectrum of Simulation Tools and Simulation Applications which can be used for Patient Safety Training and Training to Uplift Patient Safety
Task trainers
Low fidelity to high fidelity mannikins
Hybrid simulation
In situ simulation
In laboratory simulation
Participatory Simulation
Ergonomic Simulation
Use of Standardized Patients
Team Simulation
Virtual Reality, Augmented Reality and Extended Reality Training
Serious Games with Patient safety Initiatives
Large scale simulation: eg. disaster simulation and mass casualty simulation
Table top exercises

Integration of Simulation (Table 2)

When it comes to integrating simulation-based education (learning and teaching), there is always a concern of cost. This is especially true for lower to middle income countries. However, the issue of cost can be addressed by the following suggestions [25].

- Using lower cost, homemade models. These may not offer the highest fidelity, but fidelity only needs to be as high as it can meet the learning objectives. Lower fidelity models are often sufficient to address Patient Safety learning objectives [25, 26].
- The application of the principles of simulation-based learning is what is important: that is the ability to have repetitive, deliberate practice till a certain level of proficiency/ mastery is attained, no real patients are harmed, can be executed in any situation/ circumstances [21, 25]
- Using new innovative models which can be developed and customized to the local setting [26].
- Incorporating hybrid simulation (with the use of Standardized Patients) where fidelity can be uplifted but cost remains very reasonable [26, 28]
- Using initiatives such as The Mayhem Room concept of teaching patient safety, which is extremely low cost [30]

These initiatives are valuable to assist in addressing the financial divide with simulation-based education and training. Table 2, which focuses on the domains from the 7X5 matrix, summarizes how simulation can be integrated proactively, with examples. Patient Safety Officers can maintain the robustness and dynamism of this matrix using specific, practical local initiatives. It represents a 'live document', to be updated at intervals, shared with the relevant departments and be used to plan future Patient Safety interventions accordingly. Simulation can be used to trial new safety policies before formal implementation. (Table 2) For simulation-based policy testing, the important steps are:

a. Designing the scenario with a focus on where and how the new policy applies.
b. Plan and conduct the scenario using in situ (or other forms of simulation) simulation
c. Identify any gaps/ latent threats and delays during execution. These can be divided into the equipment, manpower or workflow accordingly.
d. Conduct debriefing and collate inputs. Review the necessary changes and refine the pathway and policy as needed.

A good example would be to test out a new transfer protocol between facilities. High reliability organizations (HROs) provide safe, high-quality, and effective care in highly complex and risk-prone environments without causing harm or experiencing catastrophic events. (Table 2) They way these HROs get to the stage of such high performance, is by using regular simulations in a wide variety of pathways and processes testing [31, 32]. The highly complex and risk prone environments include Emergency Departments' resuscitation rooms, Intensive Care Units and High Dependency Units, where complex, multi-faceted, time-dependent and highrisk cases are managed. The value of simulation is to practice routine "bread and butter" cases to uplift familiarity, as well as, to prepare for the rare, highly complex and important cases such as management of Malignant Hyperthermia, Emergency Department Thoracotomy or Peri-Mortem Caesarean Section in maternal cardiac arrest [25, 31, 32]. In addition to patient care, simulations can also be used to identify events that may occur in high-risk settings and threaten patient safety before they actually happen. [21, 25] Simulation training using a variety of currently available tools is used for a variety of *training to familiarize staff with processes and procedures*. This applies to both young and novice staff who are beginning to build up their *competencies, skills and capabilities* (eg. in attaining their entrustable professional activities, EPAs), as well as for faculty to upkeep their skills (eg. credentialling) [9, 21].

Simulations can also be used during individual professional updates, regardless of years of experience, such as adaptation to new diagnostic and treatment methods, experiencing technological advancements integrated into clinical practice before patient contact, and incorporating changes introduced in newly published guidelines into daily practice. A variety of checklists are also utilized, especially in HROs to ensure safe systems and practices [16]. In today's healthcare practice, *patients, families and civil society are engaged* for their inputs, feedback and contributions. They have become part of the equation in the Patient Safety matrix. Proper recruitment, appointment and briefing on their roles is crucial to ensure the partnership value-adds to Patient Safety programmes and initiatives. The SingHealth Patient Advocacy Network (SPAN) is a self-driven network of patients and caregivers that represents the collective voices of patients. As Patient Advocates, they are committed to making a positive impact on healthcare and work in close partnership with the healthcare team to provide important patient and family perspectives to enhance the patient experience and quality of care. Established in March 2017, SPAN is strategically guided by the Patient and Caregiver Engagement Framework for the SingHealth cluster, and

works in close partnership with SingHealth Group Office of Patient Experience and SingHealth Group Nursing. SPAN is a reflection of SingHealth's commitment to designing a healthcare system that is truly for patients, by patients [33].

Patient Advocates of varied backgrounds, ages and medical conditions, lend insightful perspectives of the patient and family experience, in areas such as (but not limited to) [33, 34]:

- Consultation and/or participation in projects for quality improvement, process design, patient experience, facility design, implementation of healthcare services and more. Depending on the scope of the project, Patient Advocates may be roped in for one-time consultations or co-opted as a member of the project team.
- Sharing of experience through talks, skits and more
- Patient, caregiver and staff education initiatives
- Engagement as judges of staff and patient awards (including national-level awards like the Singapore Health Quality Service Awards and the Singapore Health Inspirational Patient & Caregiver Awards)
- Healthcare improvement initiatives – these deep insights are welcomed by the healthcare community in meeting the need of understanding what matters to patients and caregivers

Table 2: How Simulation can be Integrated into the WHO Matrix for Patient Safety (SBAR: 4 step communication framework ie. Situation; Background; Assessment and Recommendations, BCLS: Basic Cardiac Life support, ACLS: Advanced Cardiac Life support, ATLS: Advanced Trauma Life support)

Domains	Integration of Simulation	Examples of Initiatives
Policies to eliminate avoidable harm in healthcare	Use simulation to test out new safety policies before implementation	Testing new patient transfer protocols (include rial of equipment, monitoring, manpower requirements, patient factors, stabilization needed and handover information such as using SBAR)
		Standard requirements such as BCLS, ACLS, ATLS training and recertification
High reliability systems	Use in situ simulation to conduct risk assessment and management in order to detect systems flaws (latent threats) that can be mitigated before these cause errors/ lapses in patient safety	Testing complex or rare care pathways (eg. Malignant Hyperthermia pathway, Emergency Department Thoracotomy or Perimortem Caesarean Section)
		Practicing commonly utilized pathways, in order to fine-tune and familiarize
		Teams training, Crisis Resource Management (CRM) and Ergonomic Simulation
Safety of clinical systems	Use simulation for designing, re-designing and testing out clinical practice protocols. This includes the creation of clinical scenarios on medication safety, infection control, use of new checklists etc	The WHO Surgical safety Checklist is a good example
		Use of task trainers for procedure training and proficiency
		Serious games to complement training
Patient and family engagements	This involves a two step process:	• Some useful and practical examples include: • Communications training • Breaking bad news • Open disclosure for errors • Patient experience such as "mystery shopper" approach
	1. Engagement of patients, families and civil society in co-development of policies/ strategies and programmes to ensure safer systems	
	2. Getting them to be involved in simulated scenarios in testing out the initiatives	

Healthcare worker education, skills and safety	Training in technical, non-technical skills and assessments using the spectrum of simulation-based education	This would include training in : • Entrustable Professional Activities (EPAs) and Competencies or skills for procedures • Inter-professional collaborative practice and teams training • Psychological safety in training
Information, research and risk management	Use of simulation to re-enact scenarios from RCAs (Root Cause Analysis) or SREs (Serious Reportable Events) incidents. Sharing of best practices on a variety of platforms, both face-to-face and virtually Generating ideas for Quality Improvement Projects/ Research	• Pulling out specific examples of incidents, errors and situations that have happened can be a powerful simulation learning experience • Data driven simulation for risk management • Monitoring and syndromic surveillance in healthcare institutions
Synergy, partnerships and solidarity	Use of simulation-based training for a variety of such partnerships and interactions	• Training for IPE/ IPCP (inter professional education and inter-professional collaborative practice teams) • Preparing for disaster preparedness and pandemics • Training and testing for community health partnerships and workflows such as in public health approaches • Applying evidence-based research and cultural transformation • Stakeholders engagement

Training and development are key in supporting Patient Advocates in their exciting role as partners-in-healthcare. Many of the above activities and initiatives also involve simulation. In fact some of the SPAN members also serve as Standardized Patients in our carefully crafted scenarios. They attend compulsory onboarding training, as well as other training sessions on Quality Improvement, Design Thinking and Story-telling [28, 34]. Additionally, involving individuals defined as patient advocates in simulations may also be beneficial to ensure that they accurately understand healthcare services, the medical and nursing professions, and treatment processes, and that they play an effective role in identifying issues related to patient safety. Under *Research and Risk Management*, various initiatives have been developed. One easily accessible example would be to collect and track the list of Patient Safety related information or data; medication errors, human factor lapses. The objective of this is not for 'blaming' individuals or execution of punitive measures, but more so to use the database to craft scenarios which can then be re-enacted via simulation, for teaching purposes. Although concerns about being "held responsible" may lead to limitations in feedback and data collection among healthcare workers, appropriately informing staff about the purpose of these processes would provide significant benefits in the creation of a comprehensive database. The database can also serve as a 'tracking register'. Cases involved in Root Cause Analysis (RCA) or Serious Reportable Events (SRE) can also be included. In SingHealth, the Department of Emergency Medicine works with the Singhealth Duke NUS Institute of Medical Simulation (SIMS) to craft and run scenarios for teaching both residents and faculty [5, 25, 32, 35]. Under *Synergy and Partnerships*, simulation can also be used to plan new strategies, execution of preparedness training for pandemics, mass casualty incidents and even disasters. These represent high stakes, low frequency and complex scenarios which can make significant impact, with adequate planning. This offers the opportunities for Patient Safety champions to work with other specialists and disciplines and thus promote interprofessional collaborative practice and inter-professional education [23, 32, 35]. Simulation-based strategies can also play a critical role in *disaster preparedness and surge capacity planning*, especially in emergency departments and resource-limited healthcare systems. During disasters, patient safety threats frequently arise not only from individual clinical errors, but also from systems-level vulnerabilities such as communication breakdowns, overcrowding, triage delays, equipment limitations, unclear role allocation and interprofessional coordination failures. In situ simulation offers a unique opportunity to identify these Latent Safety Threats (LSTs) within the actual clinical environment before real incidents occur [25, 36, 37].

Unlike simulation conducted in dedicated centers, in situ simulation allows healthcare teams to test workflows, operational readiness, escalation pathways and teamwork dynamics in the real clinical workspace. This is particularly valuable for emergency departments managing high patient volumes, disaster-prone regions and austere environments, where healthcare systems are vulnerable to sudden surges and operational disruption. Simulation exercises can proactively expose weaknesses in patient flow, communication systems, equipment accessibility, resuscitation readiness and leadership structures, thereby strengthening institutional resilience and improving patient safety outcomes [37]. Importantly, simulation-based disaster preparedness should not only focus on technical competencies, but also on psychological safety, adaptability and team communication under stress. Hierarchical barriers, hesitation in speaking up and cognitive overload may become amplified during disasters and mass casualty incidents. Structured simulation and debriefing sessions can help healthcare teams cultivate psychological safety and interprofessional collaboration, which are essential characteristics of high reliability organizations (HROs) [6, 37]. Future-proofing patient safety initiatives therefore requires simulation programmes that extend beyond procedural training. There is a need to incorporate systems testing, surge preparedness, translational simulation and organizational learning [25]. This becomes increasingly relevant in the face of global challenges such as pandemics, natural disasters, humanitarian crises and emergency department overcrowding. Table 2 summarizes how simulation can be integrated proactively into the 7X5 matrix, which acts as a good guide for training and implementation. Some examples are also shared to help illustrate this. This matrix can serve as a live document (to be reviewed and updated as needed) for departments to maintain robust and comprehensive activities and engagements around Patient Safety [35, 36, 38].

Strategies for the Future

As we move along into the age of technology and Artificial Intelligence (AI), some aspects of these would have to be integrated into our Patient Safety practice. Below are some examples:

1. Use of Artificial Intelligence and Advanced Analytics: this involves manual to digital upliftment and add-ons. It will enable real-time risks prediction, immediate error detection and enhance diagnostic accuracy.
2. Digital transformation: the use of electronic health records will streamline care continuity and access. Checking for details on patient care will be easier and faster, preferably on a one-stop portal.
3. Safety Culture training: inculcating the norms of practice in every step. Despite changes, principles must apply across all aspects of patient care delivery
4. Smart Infrastructure: this is where modular, flexible spaces are utilized, with the integration of the 'Internet of Things' to enhance workflow
5. Standardization and protocols: this will drive interventions and practice.
6. Patient and family engagement: There is much to learn from them as end users of our healthcare systems and interventions. Movement towards self-data access by patients and better educated patients is inevitable. It is just a matter of time.
7. Emotional and resilience training: simulation provides a safe environment to practise managing stress and emotions in high-acuity scenarios, with structured debriefing enhancing self-awareness, team communication, and patient safety outcomes.

Besides the above, healthcare institutions must also be focus on data security (to protect digital infrastructure), environmental sustainability (durability and energy efficiency) and workforce support and psychological safety. Additionally, empirical evidence suggests the potential of Artificial Intelligence (AI) to improve patient safety. A scoping review (involving 73 studies) indicated that AI can be used to reduce harm in eight major domains: Healthcare-Associated Infections (HAIs), Adverse Drug Events (ADE), Venous thromboembolism, Surgical complications, Pressure ulcers, Falls, as well as Decompensation and Diagnostic errors [39]. Specifically, AI models were implemented for early detection of healthcare-associated infections (HAIs), and for improving adherence to hospital safety protocol. Different AI models can be used to predict adverse drug reactions and later help in the development of safe medication guidelines [39]. Furthermore, AI appeared to have moderate impact on the reduction of venous thromboembolism, the prediction of surgical complications (such as technical issues and infection) and the improvement of surgical safety. New evidence suggested that AI had moderate impact on the prediction of patients who are at risk of pressure ulcers, the prediction of decompensation, and the prevention of fall. Finally, AI models (such as machine learning) may play a role in reducing diagnostic errors by leveraging recognition patterns, minimizing bias, and processing

immense volumes of data, which are common challenges for human doctors [39]. Eventually, despite all these new developments and technology, we must continue to ensure that we "maintain humanism in the age of technology and AI".

Conclusion

In 2024, WHO published its first *Global Patient Safety Report 2024* to provide a comprehensive global overview of patient safety implementation. The 2024 report highlighted significant gaps in patient safety education and training. Only **22% of countries** have a national institution offering patient safety education. While the GPSAP promotes innovative teaching and **simulation-based training**, just **19% of countries** report full integration of these methods into curricula, and **33%** have conducted pilot simulation trainings, indicating substantial opportunities for scale-up and investment [40]. With better and more widespread understanding, simulation can support the WHO GPSAP by:

- Reducing preventable harm
- Identification of latent threats
- Conducting in situ simulation to test both systems and human factors to plan optimization
- Uplifting Patient Safety education and Safety Culture
- Implementing and expanding patient and community engagement in terms of Patient Safety dialogues and participation

All these will contribute towards strengthening teamwork, IPCP and healthcare workforce competence. It can be used across the whole spectrum of learners; from undergraduate to faculty development. [38] The issue of cost too can be managed with reasonable choices, as discussed. Eventually, with simulation, we can ensure it will never be "first on the patient" principle.

Conflict of Interest: Nill

Endnotes: Nill

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