Saudi Journal of Medicine and Public Health

When Words Become Risks: An Interprofessional Framework for Preventing Health Literacy-Related Patient Harm

Bader Mohammed Alanazi [1] , Fahad Almubayrikn [2] , Abdulrahman Abdullah Alenazi [3] , Miqad Gaed Alotaibi [4] , Mudaysh Yahya Ahmad Bajawi [5] , Reham Abdu Abdallah Refaee [1] , Entesar Gebreel Ahmed Showaihy [6] , Mohammed Saud Saad Alsaedi [7] , Fatema Ayesh Alhassan Aladeny [8] , Ohoud Alhumidi Almutairi [9] , Azzam Ali Hamoud Alharbi [10] , Nasser Ibrahem Nasser Almohaizef [11] , Rahmah Fatel Samran AL-Ruwaily [12] , Hana Ashawi Alanazi [13]

(1) Ministry Of Health, Saudi Arabia,
(2) King Fahd Specialist Hospital In Buraidah,Ministry of Health, Saudi Arabia,
(3) Riyadh City,Ministry of Health, Saudi Arabia,
(4) Diriyah Hospital In Diriyah Governorate In Riyadh City,Ministry of Health, Saudi Arabia,
(5) General Theater Hospital, Ministry of Health, Saudi Arabia,
(6) Erada Hospital For Mental Health In Jazan, Ministry of Health, Saudi Arabia,
(7) Maternity and Children Hospital, Ministry of Health, Saudi Arabia,
(8) Ltc Hospital,Ministry of Health, Saudi Arabia,
(9) Arada Mental Health Hospital Riyadh,Ministry of Health, Saudi Arabia,
(10) Resource Control Center, Ministry of Health, Saudi Arabia,
(11) Tumair General Hospital,Ministry of Health, Saudi Arabia,
(12) Hafer AL-Baten Centeral Hospital,Ministry of Health, Saudi Arabia,
(13) Al Waha Health Center,Ministry of Health, Saudi Arabia

Abstract

Background: Limited health literacy affects approximately one-third of adults in developed nations, creating a critical patient safety vulnerability. When patients cannot effectively access, understand, or apply health information, the risks of medication errors, missed diagnoses, poor self-management, and avoidable hospitalizations escalate. Addressing this challenge requires moving beyond patient education to systemic, interprofessional strategies.

Aim: This narrative review aims to synthesize evidence on interprofessional, system-level strategies that mitigate health literacy-related patient safety risks, focusing on the synergistic roles of health assistants, nurses, pharmacists, and health informatics.

Methods: A systematic search of PubMed, CINAHL, PsycINFO, and Scopus databases (2010-2024) was conducted. Keywords included *health literacy*, *patient safety*, *medication errors*, *interprofessional communication*, *universal precautions*, and *health informatics*. Included literature comprised systematic reviews, interventional studies, qualitative analyses, and grey literature from safety organizations.

Results: Effective mitigation is a shared responsibility. Health assistants provide crucial relational continuity and identify comprehension gaps. Nurses operationalize teach-back and plain language in clinical workflows. Pharmacists conduct brown-bag medication reviews and simplify complex regimens. Health informatics supports these roles through patient-friendly portals, automated medication reconciliation, and clinical decision support alerts for high-risk patients. Integration of these roles via structured protocols reduces communication breakdowns and preventable harm.

Conclusion: Health literacy is not a patient deficit but a design flaw in healthcare systems. An interprofessional, "universal precautions" approach—leveraging the unique skills of frontline and informatics teams—is essential to build safer, more equitable healthcare communication and reduce errors.

Keywords: Health Literacy, Medication Errors, Patient Safety, Interprofessional Relations, Health Communication.

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Introduction

needed to make appropriate health decisions, is a fundamental determinant of health outcomes and a cornerstone of patient safety (Berkman et al., 2011). However, its absence constitutes a silent, pervasive, and potent risk factor within healthcare systems. An estimated 36% of U.S. adults possess only basic or below-basic health literacy skills, a figure that disproportionately affects older adults, minority populations, and those with lower socioeconomic status, thereby exacerbating health inequities (Brach & Harris, 2021). The safety implications are

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profound and costly: patients with limited health literacy experience higher rates of medication administration errors, increased emergency department utilization, more frequent hospital readmissions, and a diminished capacity to participate in shared decision-making or manage chronic conditions effectively (Batterham et al., 2016).

Traditionally, the burden of comprehension has been placed on the patient, with interventions focusing on simplifying educational materials. This narrative review argues that this is an insufficient and misdirected approach. Instead, health literacy must be reframed as a systems safety issue, demanding coordinated, interprofessional strategies that hardwire clear communication into the very fabric of care delivery. This review aims to examine how a defined team—spanning the relational continuity of health assistants, the clinical workflow integration by nurses, the medication expertise of pharmacists, and the architectural power of health informatics—can collectively construct a robust defense against literacy-related errors. By mapping their synergistic roles, we propose a model where safety is proactively engineered through communication, rather than reactively addressed after harm occurs.

The Nexus of Health Literacy and Patient Safety

The intersection of limited health literacy and patient safety is not merely correlational but causal, creating a distinct and hazardous clinical environment. The mechanisms of harm are multifaceted. First, medication safety is critically compromised. Patients may misunderstand dosage instructions ("take two tablets twice daily" misinterpreted as taking two tablets total per day), fail to recognize duplicate therapies under different brand names, or be unable to read warning labels, leading to adverse drug events (ADEs) (Kripalani et al., 2010). Second, diagnostic and follow-up errors are prevalent. Patients may not comprehend preparation instructions for diagnostic tests (e.g., colonoscopy bowel prep), leading to cancelled procedures or inaccurate results. They may also misunderstand discharge instructions or fail to recognize "red flag" symptoms requiring prompt follow-up, resulting in delayed care and clinical deterioration (Young et al., 2023). Third, informed consent and shared decision-making become ethically problematic.

Without a clear understanding of risks, benefits, and alternatives, consent is not truly informed, violating patient autonomy and potentially leading to regret or litigation (Paterick & Paterick, 2019). The economic burden is staggering, with studies attributing billions in annual excess healthcare costs to limited health literacy, primarily due to increased hospitalizations and avoidable complications (Auld et al., 2020). Crucially, clinicians consistently overestimate their patients'

comprehension and their own communication effectiveness, a phenomenon known as the "curse of knowledge," which further obscures the problem until a safety incident occurs (Back et al., 2013). This evidence base compels a paradigm shift from viewing health literacy as an individual patient characteristic to treating it as a universal design challenge for healthcare systems.

A Foundational Framework for Interprofessional Action

Given the difficulty in accurately identifying patients with limited health literacy and the stigma associated with disclosure, the most effective and equitable approach is the adoption of health literacy universal precautions. This framework, endorsed by the Agency for Healthcare Research and Quality (AHRQ), posits that healthcare systems should simplify communication and ensure understanding for *all* patients, regardless of their perceived literacy level, because safety cannot rely on perfect risk identification (Precautions, 2010). Universal precautions provide the shared philosophical foundation for interprofessional action, comprising four key principles: 1) Simplify Communication: Use plain, non-medical language and the teach-back method. 2) Make the System Easy to Navigate: Provide clear signage and assistance. 3) Support Patient Engagement: Use shared decision-making aids. 4) Confirm Understanding: Systematically employ teach-back and show-back (e.g., demonstrating inhaler technique).

Implementing these precautions is not the responsibility of a single profession but requires a choreographed team effort. Each team member applies the principles within their scope of practice and workflow, creating multiple, reinforcing layers of safety. For instance, while a nurse uses teach-back for discharge instructions, a pharmacist uses it for new medications, and a health assistant reinforces it during appointment scheduling. Health informatics can embed prompts for these actions within the electronic health record (EHR). This distributed, redundancy-based model mirrors high-reliability organizations, where critical processes (like communication) are protected by multiple, independent checks (Weick & Sutcliffe, 2015). The following sections detail how health assistants, nurses, pharmacists, and informatics specialists operationalize these universal precautions to mitigate specific safety risks.

The Role of the Health Assistant

Health assistants (including medical assistants, patient navigators, and community health workers) serve as indispensable frontline sentinels and cultural/linguistic bridges in the health literacy safety net. Positioned at key access points—check-in, vital signs measurement, and pre-encounter intake—they have unique, often non-threatening opportunities

to assess and address comprehension gaps. Their role is threefold: identification, navigation, and relational continuity. First, through informal conversation while rooming a patient, a health assistant can identify potential misunderstandings or anxieties about the upcoming visit that the patient may not voice to the provider (Fortmann et al., 2021). Second, they are pivotal in making the healthcare system navigable. They can help patients complete complex forms, explain clinic workflows, schedule follow-up appointments, and connect patients to community resources or transportation services, reducing the cognitive load that can overwhelm patients and lead to missed care (Koh et al., 2013). Third, and most critically for safety, they provide relational continuity.

A familiar, trusted health assistant can reinforce and clarify instructions given by the physician or nurse in a less rushed setting. For example, after a provider explains a new diagnosis, the health assistant can ask, "Just to make sure everything was clear, what are the next steps you're going to take when you get home?" This informal teach-back creates a vital second safety loop. Training health assistants in basic health literacy principles, active listening, and how to use simple, approved patient education materials empowers them to fulfill this role effectively, transforming routine administrative tasks into key moments for safety reinforcement (Rondeaux et al., 2023).

Nursing: Operationalizing Safety Through Workflow Integration

Registered nurses are the operational engineers of patient safety, uniquely positioned to integrate health literacy universal precautions into the core clinical workflow across inpatient and outpatient settings. Their continuous patient contact and responsibility for care coordination make them essential in translating information into safe action. Key nursing-driven strategies include the systematic use of teach-back and discharge planning anchored in comprehension. Teach-back, where clinicians ask patients to explain in their own words what they need to know or do, is one of the most evidence-based methods for confirming understanding and reducing errors (Dinh et al., 2016).

Nurses can incorporate teach-back not as an add-on, but as a standard step when providing medication education, explaining post-procedure care, or reviewing disease management plans. Furthermore, nurses are central to preventing harmful discharge transitions. The implementation of the AHRQ Health Literacy Toolkit or similar protocols guides nurses to use plain language discharge instructions, verify transportation plans, and ensure follow-up appointments are scheduled and understood before the patient leaves the unit (Kashiwabara, 2023). In ambulatory care, nurse care managers for chronic diseases like diabetes or heart failure use health literacy-sensitive approaches to coach patients on self-monitoring, recognizing warning signs, and adhering to complex regimens. By standardizing these communication practices—making teach-back as routine as checking a vital sign—nursing practice hardwires safety into daily care, intercepting errors arising from misunderstandings before they reach the patient at home (Yen & Leasure, 2019). Table 1 and Figure 1 show the interprofessional roles in mitigating health literacy-related safety risks.

Table 1: Interprofessional Roles in Mitigating Health Literacy-Related Safety Risks

Professional Role	Primary Safety Risks Addressed	Key Health Literacy Strategies	Example Interventions
Health Assistant	Missed appointments; Incomplete forms/histories; Poor system navigation; Unvoiced comprehension gaps.	Relational continuity; System navigation aid; Informal teach-back/reinforcement; Use of pre-approved plain language materials.	Guiding patients through intake forms; Using a "check-back" question after provider visits; Scheduling follow-up with clear, written details.
Nurse	Medication administration errors; Discharge plan failures; Inadequate self-management; Misunderstood procedure prep.	Formal teach-back protocol; Plain language discharge instructions; Use of visual aids; Chronic disease coaching.	Conducting medication reconciliation using teach-back; Creating pictogram-based schedules; Leading pre-discharge "care huddles."
Pharmacist	Polypharmacy & duplication errors; Improper dosing/timing; Drug-disease interactions; Misuse of devices (inhalers, pens).	Medication therapy management (MTM); "Brown bag" reviews; Simplified labeling; Device demonstration with "show-back."	Providing dose administration aids (pill organizers); Using universal medication schedule (UMS) labels; Conducting telephone follow-up for high-risk patients.
Health Informatics	Inaccessible patient portals; Un-actionable clinical	Design of patient-facing IT (portals, apps); Clinical decision	Automating medication reconciliation alerts;

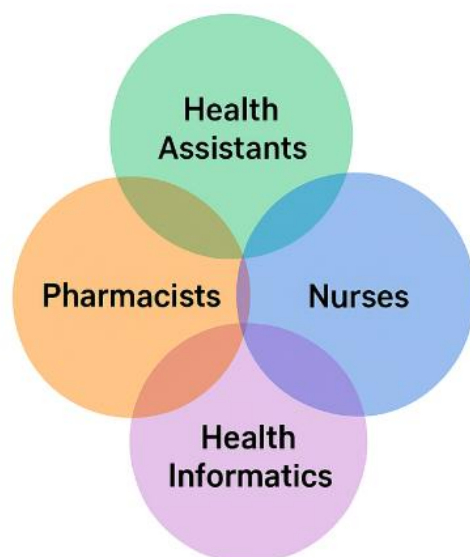| alerts; Lack of prompts for literacy-sensitive care; Complex EHR data for patients. | support (CDS) alerts; Integration of teach-back prompts into EHR workflow; Data visualization. | Embedding a "teach-back completed" field in discharge modules; Developing patient-friendly after-visit summaries. |

Figure 1: Synergistic Interprofessional Roles in Preventing Health Literacy–Related Patient Harm Pharmacy: The Medication Safety Experts in a Low-Literacy Context

Pharmacists are the medication safety experts whose interventions are uniquely potent in a low-health-literacy environment. Misunderstanding of medication instructions is a direct and frequent cause of preventable harm, making the pharmacist's role in applying universal precautions critical. Their strategies move beyond dispensing to active verification and simplification. Medication Therapy Management (MTM) and comprehensive medication reconciliation are cornerstone practices. During MTM, pharmacists conduct "brown-bag" reviews, where patients bring all their medications, allowing for the identification of duplicates, expired drugs, and unnecessary therapies (Smith et al., 2020). Crucially, during this review, pharmacists assess understanding using open-ended questions (e.g., "Can you walk me through how and when you take this pill?") rather than yes/no questions (e.g., "Do you understand?"). Furthermore, pharmacists lead the move toward patient-centered prescription labeling. The adoption of the Universal Medication Schedule (UMS), which translates "take two tablets twice daily" into explicit, plain language instructions with specific times (e.g., "Take 2 pills in the morning and 2 pills at night"), has been shown to significantly improve adherence and reduce dosing errors (Ylä-Rautio et al., 2020).

For patients with dexterity or vision challenges, pharmacists can recommend and train on assistive devices. Perhaps most importantly, pharmacists are essential in verifying patient competency with medical devices—such as inhalers, epinephrine auto-injectors, or insulin pens—using the "show-back" method, where the patient demonstrates use. This intercepts technique errors that written or verbal instructions alone cannot prevent (Faber et al., 2023). Embedding pharmacists in primary care teams or establishing robust community pharmacy referral pathways ensures these safety checks are integrated into the patient's ongoing care.

Health Informatics: Architecting Systems for Clarity and Safety

Health informatics provides the architectural backbone for scaling and sustaining interprofessional health literacy strategies. If other team members address communication at the human interface, informatics addresses it at the system interface, designing technology that supports rather than hinders understanding. This role encompasses patient-facing technology, clinician-facing decision support, and data integration. First, patient portals and mobile health applications must be designed with health literacy in mind. This involves intuitive navigation, actionable alerts (e.g., "Your lab result is normal" vs. just displaying a numeric value), and the integration of multimedia educational content (video, audio) alongside text (Tieu et al., 2017). Second, and critically for safety, clinical decision support (CDS) tools can be engineered to prompt and support literacy-sensitive care.

The EHR can prompt clinicians when a new medication is prescribed: "Use teach-back to confirm understanding. Click here for a plain language description." It can also flag high-risk patients (e.g., those on >5 medications, with prior non-adherence) for automatic referral to pharmacy MTM or nurse coaching (Fitzpatrick, 2023). Third, informatics enables the automation of patient-friendly materials. Tools can instantly generate after-visit summaries and discharge instructions in plain language at a 5th- to 7th-grade reading level, incorporating the patient's specific medications and follow-up plans directly from the EHR (Zullig et al., 2014). Finally, informatics facilitates population health management by identifying patient cohorts with conditions prone to literacy-related errors (e.g., heart failure) and enabling targeted, team-based outreach. By building these principles into the digital infrastructure, informatics makes the universal precautions approach efficient, systematic, and less reliant on individual memory or initiative. Figure 2 presents a progressive framework for applying health literacy universal precautions—screening, assessing,

educating, and empowering patients—to enhance patient safety outcomes.

Table 2 illustrates the examples of health informatics tools to support interprofessional safety

Table 2: Examples of Health Informatics Tools to Support Interprofessional Safety

| Tool Type	Function in Health Literacy/Safety	Interprofessional User	Intended Outcome
EHR-Integrated Teach-Back Prompt	Automatic alert in workflow when a new complex instruction is given (new diagnosis, medication, procedure).	Nurse, Physician, Pharmacist	Increases consistent use of teach-back to verify comprehension.
Automated Plain Language After-Visit Summary	Generates a customized, easy-to-read summary post-encounter, pulling data from EHR (meds, appointments, instructions).	Entire Team; Given to Patient	Provides a clear, standardized reference for the patient, reducing recall errors.
Medication Reconciliation Alert	Flags discrepancies between the EHR medication list and patient-reported list during intake or discharge.	Pharmacist, Nurse, Health Assistant	Identifies potential medication errors or misunderstandings for immediate clarification.
Patient Portal with Multimedia Education	Provides access to tailored education videos, interactive tools, and secure messaging in an easy-to-navigate format.	Patient, with facilitation by Health Assistant/Nurse	Engages patients in preferred learning format and provides reliable information post-visit.
Population Health Dashboard	Identifies patients with high-risk criteria (polypharmacy, low literacy scores if available, high ED use) for proactive outreach.	Care Manager (Nurse), Pharmacist, Health Assistant	Enables targeted, team-based intervention for the most vulnerable patients.
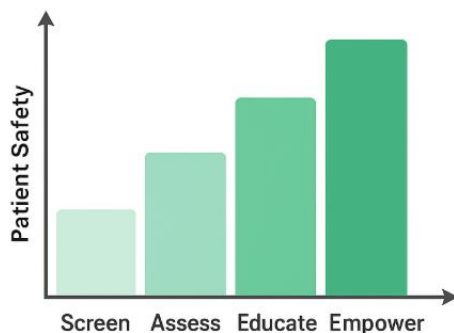
Figure 2: Universal Precautions Approach to Health Literacy and Patient Safety

Synergy in Action: Models of Interprofessional Integration

The true power of these roles is realized not in isolation but through deliberate integration into collaborative care models. Two exemplary frameworks are Team-Based Care and Integrated Pharmacist Models. In a mature team-based primary care setting, a patient with diabetes and limited health literacy might interact with a coordinated unit: the health assistant rooms the patient, noting a forgotten glucose log; the nurse performs teach-back on foot care and hypoglycemia symptoms using visual aids; the family physician adjusts medications; the pharmacist, colocated in the clinic, conducts a brief MTM session, simplifies the regimen, and provides a UMS label; and all actions and patient comprehension levels are documented in shared EHR fields designed by informatics (Pandhi et al., 2018).

Another powerful model is the Project RED (Re-Engineered Discharge) protocol, which formalizes nurse- and pharmacist-led discharge processes including medication reconciliation, a plain language discharge booklet, and post-discharge follow-up calls—all structured to confirm understanding (Roberts et al., 2019). These models succeed because they create closed-loop communication. Information and verification responsibilities are explicitly shared, with handoffs designed to include a literacy-sensitive component (e.g., "I've done teach-back on the new antibiotic; please reinforce during your device demonstration"). Regular interprofessional huddles to review high-risk patients further strengthen this integration, ensuring the safety net has no gaps (O'Leary et al., 2011). The evidence shows that such integrated approaches yield superior outcomes in medication adherence, disease control, and reduced readmissions compared to usual, siloed care.

Measuring Impact and Outcomes

Evaluating the success of interprofessional health literacy interventions requires a mix of process, outcome, and balancing measures. Process measures assess the fidelity of implementation: the percentage of discharge encounters where teach-back is documented, the rate of pharmacist MTM completion for high-risk patients, or the utilization of patient portal tools (Parker et al., 2020). Outcome measures directly track patient safety and health: rates of medication errors (both prescribing and administration), hospital readmissions within 30 days, emergency department visits for ambulatory

care-sensitive conditions, and clinical outcomes like HbA1c control or blood pressure targets (Mackert et al., 2016).

Patient-reported measures are equally critical, including surveys on communication clarity, perceived self-efficacy in managing health, and satisfaction with care (Chisolm et al., 2021). Importantly, balancing measures must monitor for unintended consequences, such as increased visit length, clinician burnout from added documentation, or disparities in access to new digital tools. Studies of implemented programs show promising results. For instance, hospitals implementing nurse-pharmacist discharge bundles report significant reductions in post-discharge ADEs (Schnipper et al., 2022). Clinics using team-based care with health assistants report improved patient satisfaction and better chronic disease management (Willard-Grace et al., 2014). These metrics not only demonstrate value but are essential for securing ongoing institutional support and resources for interprofessional safety initiatives.

Challenges, Future Directions, and Conclusion

Despite a strong evidence base, significant challenges impede widespread adoption. These include siloed professional cultures and workflows, a lack of reimbursement for non-billable services like comprehensive medication review or health assistant coaching, insufficient training in health literacy principles for all team members, and technological barriers like poorly designed EHRs that hinder rather than help clear communication (Parnell et al., 2019). Future directions must address these barriers. Policy advocacy for value-based payment models that reward safety outcomes is crucial. Educational curricula for all health professions must embed health literacy and interprofessional collaboration as core competencies. Technologically, the next frontier includes artificial intelligence (AI) and natural language processing (NLP) to instantly "translate" complex clinical notes into patient-friendly language or to analyze patient portal messages for signs of confusion or health deterioration (Sarker et al., 2024). Furthermore, community-engaged design of tools and protocols will ensure they are culturally and linguistically appropriate.

In conclusion, health literacy is a formidable patient safety variable that cannot be optimized by any single profession working alone. As this review has detailed, mitigating literacy-related errors requires an interprofessional, system-wide strategy grounded in the principle of universal precautions. Health assistants act as sentinels and navigators, nurses hardwire verification into clinical workflow, pharmacists simplify and verify medication understanding, and health informatics architects support supportive digital environments. Their roles are interdependent; the pharmacist's brown-bag review is more effective if a nurse has already used teach-back, and the EHR prompt reminds the busy clinician to do so. The evidence is clear: when these roles are consciously integrated through team-based models and supported by thoughtful informatics, they form a resilient safety net that reduces errors, improves outcomes, and advances health equity. Therefore, healthcare organizations must move beyond publishing easy-to-read pamphlets and instead invest in building these interprofessional communication systems. In doing so, they will not only enhance safety but also honor the ethical imperative to ensure that every patient truly understands their care.

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