**Global Initiatives for Improving Health and Medication Literacy**

**Health literacy**

Health literacy emphasizes not only the understanding of health information but, more crucially, the application of this information in real-life situations. It underscores people's ability to use health information actively for the betterment of their health. It recognizes the dynamic nature of health literacy, transcending passive comprehension to active engagement with health-related decisions.

**Relevance in COVID-19 Pandemic:**

**1. Complex Health Concepts and Community Understanding:**

 The COVID-19 pandemic underscores the importance of health-literate community [10]. The rapid dissemination of complex health concepts, such as vaccination strategies, infection prevention measures, and the utilization of healthcare systems, necessitates a population with adequate health literacy to comprehend and act upon this information effectively.

**2. Addressing Vulnerable Subpopulations:**

 Vulnerable subpopulations, such as those with lower health literacy, require targeted interventions during large-scale epidemics. Understanding their health literacy level is imperative for tailoring communication strategies that are effective, accessible, and actionable.

Health and medication literacy are critical components of public health, influencing individuals' ability to understand, access, and effectively use health information and medications. Insufficient health and medication literacy can lead to adverse health outcomes, increased healthcare costs, and a widening health disparity gap. Recognizing the global impact of these issues, various initiatives have emerged to enhance health and medication literacy on a worldwide scale.

**1. World Health Organization (WHO) Initiatives:** The WHO has been a prominent advocate for health literacy globally. WHO's Global Health Observatory includes efforts to collect and disseminate health literacy data to guide policies and interventions.

**2. Health Literacy Europe:** Health Literacy Europe is a network of organizations and professionals working collaboratively to promote health literacy across European countries. The organization focuses on sharing best practices, conducting research, and developing strategies to improve health literacy levels throughout Europe.

**3. National Action Plans:** Several countries have developed national action plans specifically targeting health and medication literacy. These plans outline strategies, goals, and interventions to raise awareness and improve literacy levels.

**4. Pharmaceutical Industry Initiatives:** Pharmaceutical companies play a crucial role in improving medication literacy. Some companies have developed educational programs, patient resources, and simplified medication packaging to enhance understanding and adherence. Collaborations between pharmaceutical companies and healthcare professionals aim to create patient-friendly materials and foster better communication about medications.

**5. Digital Health Literacy Initiatives:** With the increasing reliance on digital platforms for health information, initiatives focusing on digital health literacy have emerged. Organizations like the Digital Health Literacy Consortium work to ensure that individuals can critically evaluate online health information and use digital tools effectively.

**6. Academic & Nonprofit Collaborations:** Universities, research institutions, and nonprofit organizations contribute significantly to health and medication literacy through research, education, and community outreach. Collaborations between academia, healthcare providers, and community organizations help develop evidence-based interventions and educational programs.

**7. United Nations Sustainable Development Goals (SDGs):** Health literacy is interconnected with various SDGs, such as Good Health and Well-being, Quality Education, and Reduced Inequalities. International efforts to achieve these goals include addressing health literacy to empower individuals and communities for better health outcomes.

**Challenges and Future Directions:**

While significant progress has been made, challenges persist, including varying definitions of health literacy, cultural considerations, and limited resources in some regions [1]. Future initiatives should aim for:

 - Culturally sensitive interventions that address diverse populations.

 - Integration of health and medication literacy into educational curricula.

 - Research to understand the effectiveness of different interventions.

 - Collaboration between governments, organizations, and communities.

In India, despite strides in various sectors, health literacy remains a significant challenge. A pervasive belief in old wives' tales and misinformation has contributed to a staggering lack of understanding about health matters. A 2019 report by Tribune India claimed that 9 out of 10 adults are suffering from low health literacy in India [1]. However, amidst the challenges, the COVID-19 pandemic has acted as a wake-up call, prompting a shift towards better health literacy.

**1. Impact of Misinformation:**

 Many individuals hold onto misconceptions, such as the belief that cracking fingers causes arthritis or that antiperspirants cause breast cancer. This misinformation can lead to poor health decisions and increased reliance on unverified sources.

**2. Personal Experiences:**

 Radha's personal experience highlights the transformative power of education. After a family medical emergency, she recognized the importance of being informed about health matters. Sandhya, a vigilant homemaker, emphasizes the need to question doctors and educate oneself to navigate emergency situations effectively.

**3. Expert Perspectives:**

 Dr. Ananth Ram, a health systems specialist, stresses the connection between health literacy and risk perception. He argues that poor health literacy leads to resistance against health-friendly habits unless enforced by laws. A study in Bangalore revealed that adult patients of 60.4% had low health literacy who are seeking oral health care.

**4. COVID-19 as a Catalyst:**

 The COVID-19 pandemic acted as a catalyst for realizing the critical role of health literacy. The National Health Policy's shift towards health promotion indicates a positive change in perspective, moving away from mere curative measures.

**5. Consequences of Ignorance:**

 A Medical student “Shehna” highlights instances where patients react violently due to a lack of understanding of their diagnoses. Dr. Raj, a neurologist, warns against overmedication and self-medicating, emphasizing the strain it places on national and state resources.

**7. Language Barrier:**

 A significant language gap exists in health literature, hindering effective communication. Dr. Ananth Ram suggests delivering medical courses in local languages to make health information more relatable and understandable, particularly through initiatives like ASHA workers and Anganwadi’s. Improving health literacy in India is a multifaceted challenge that requires concerted efforts from individuals, healthcare professionals, and policymakers. The impact of misinformation, personal experiences, and the consequences of ignorance underscore the urgency of addressing this issue. The recent emphasis on health promotion in the National Health Policy and ongoing educational initiatives provide hope for a healthier and more informed India. As the nation progresses, investing in long-term solutions, bridging language gaps, and empowering communities through health education will be key in building a foundation of knowledge that promotes overall well-being.

**Role of Health Literacy in Medication Safety – Real life Incidents**

A two-year-old is diagnosed with an inner ear infection and prescribed an antibiotic. Her mother understands that her daughter should take the prescribed medication twice a day [28]. After carefully studying the label on the bottle and deciding that it doesn’t tell how to take the medicine, she fills a teaspoon and pours the antibiotic into her daughter’s painful ear (Parker et al., 2003).

The incident involving a mother inadvertently administering antibiotic drops to her two-year-old's ear highlights the critical importance of health literacy for patient safety (Parker, et. al., 2003). This incident, as discussed by Parker et. al., serves as a reminder of the broader challenges consumers face, particularly in the realm of over-the-counter (OTC) medications. Decisions regarding product usage, administration, and understanding evolving medical guidance require a high level of health literacy.

**Complications in Changing Medication Instructions:**

Changes in medication instructions present a significant challenge for consumers, particularly when they are accustomed to a specific usage pattern. Failure to regularly check and understand updated instructions may lead to misuse. This underscores the need for clear, consistent communication to navigate evolving medical guidance and emphasizes the crucial role of health literacy in this context.

**Confusing Medication Labeling: A Case Study:**

The New England Journal of Medicine reported a case involving a 6-year-old diagnosed with H1N1 flu, prescribed orally suspended Tamiflu (Parker, et. al., 2009). Despite having a health educator with a master's degree and an internist in the family, determining the correct dosage proved challenging due to discrepancies between prescription instructions and the dosage device [29]. This real-life example underscores the essential role of clear communication in preventing medication-related incidents. The prompt responses from the CDC and FDA further highlight the importance of collaboration in addressing such issues promptly.

**The Significance of Health Literacy:**

This example emphasizes how crucial health literacy is for patients and their families to comprehend health information and navigate healthcare effectively. Health literacy is not just about understanding the written word; it involves translating knowledge into recommended actions, applying problem-solving skills in new situations, fostering ongoing health learning, and instilling a proactive health promotion attitude.

The incidents discussed highlight the critical need for health literacy in the realm of medication safety. Clear and consistent communication, especially during changes in medication instructions or instances of confusing labeling, is vital to prevent misunderstandings and ensure proper administration. Improving health literacy levels among patients and their families is an essential step toward enhancing overall healthcare outcomes and promoting a culture of informed decision-making and proactive health management.

**Acetaminophen Challenge**

Acetaminophen, a widely used drug, poses a significant public health concern due to its association with acute liver failure, surpassing viral hepatitis in its impact (Woodcock, 2009). Unintentional overdoses, which contribute to a substantial portion of acute liver failures, underscore the urgent need to address this issue [31]. Over-the-counter medications, including acetaminophen, lack a legal framework mandating healthcare professional to provide comprehensive usage information. Recognizing active ingredients is crucial to preventing unintentional drug overdoses.

**Research Initiative to Tackle Acetaminophen Risks:**

Dr. Michael Wolf and his colleagues have embarked on a comprehensive strategy involving four studies to combat consumer misinformation regarding nonprescription pain relievers (Wolf, et. al., 2000). These studies encompass a prevalence survey, a follow-up study to understand labeling misunderstandings, and the development of icons and messages to enhance consumer understanding of products containing acetaminophen [30]. The final component involves a clinical study testing whether labeling changes effectively improve consumer understanding.

**Findings from Initial Studies:**

The first study, initiated in June 2009, aims to recruit 500 patients from Chicago and Atlanta, encompassing both academic and community settings. Interviews assess patients' functional understanding of over the counter (OTC) directions and their knowledge of active ingredients. Preliminary findings from 300 participants reveal generally accurate understanding of pills per dosage and intervals between doses. However, only 42 to 65 percent correctly identified the maximum daily dosage, indicating potential gaps in awareness.

**Labeling Misunderstandings and Consumer Awareness:**

The second survey exposed significant misunderstandings among participants regarding brand-name products containing acetaminophen. Many erroneously believed it was acceptable to take Alka Seltzer and Excedrin, which contain multiple ingredients, alongside Tylenol or generic acetaminophen. Additionally, a substantial number of patients thought combining different Tylenol medications was safe, unaware of the identical active ingredients and the risk of overdose. Factors such as age, lower literacy, and African American race correlated with a higher likelihood of medication misunderstanding.

**Addressing the Knowledge Gap:**

Evidence suggests that consumers often lack awareness of active ingredients in OTC products and misunderstand daily maximum doses. Routine usage without reading labels, based on assumed familiarity, poses risks comparable to prescription medications. Dr. Wolf emphasizes the importance of making patients aware that OTC products, including acetaminophen, can be as dangerous as prescription drugs.

**Collaborative Initiatives for Improvement:**

In response to these findings, McNeil Consumer Healthcare collaborates on a new initiative to test and develop Drug Facts Instructions and icons for acetaminophen. This initiative, spanning two sites with a total of 1,200 participants, aims to enhance labeling clarity for both prescription and nonprescription packaging (Wolf, et. al., 2022).

The comprehensive research initiative led by Dr. Michael Wolf sheds light on the challenges surrounding acetaminophen awareness and highlights the need for improved consumer education. Addressing misunderstandings through clearer labeling and enhanced awareness campaigns is crucial for promoting safer usage of acetaminophen and preventing unintentional overdoses, ultimately contributing to public health and well-being.

**Comprehensive Strategies for Enhancing Health Literacy in Organizations**

Recognizing the pivotal role of health literacy, healthcare organizations must actively integrate health literacy into their mission, structure, and operations [2]. This chapter delves into a detailed exploration of strategies that organizations can employ to seamlessly incorporate health literacy into every aspect of their services, emphasizing the creation of an inclusive and accessible healthcare environment.

**1. Organizational Health Literacy Assessment:** The journey towards patient-centric healthcare begins with a thorough organizational health literacy assessment. Utilizing specialized tools like the Pharmacy Health Literacy Assessment Tools, the organizations can evaluate their current health literacy practices. This assessment serves as a compass, guiding the formulation of robust organizational health literacy plans that include quality improvement measures, thus ensuring a continual commitment to patient engagement.

**2. Staff Training:** Recognizing that every member of the workforce plays a crucial role in patient interactions, organizations should prioritize comprehensive staff training on health literacy best practices. From frontline staff to managerial positions, individuals need to be equipped with the knowledge and skills required for effective communication. Training programs should cover the use of plain language, visual aids, and cultural sensitivity to foster clarity and respect in communication.

**3. Creating a Welcoming Environment:** Establishing a healthcare environment that is free from shame and welcoming to all patients is foundational for fostering trust and comfort. Offering resources, assistance with form-filling, and training on patient portals contribute to creating a positive patient experience.

**4. Improving Spoken Communication:** Organizations should prioritize the development of clear communication processes, including the use of plain language, visual aids, and explicit instructions. This involves limiting discussions to 3-5 key points, listening attentively without interruption, and using language familiar to patients. Encouraging questions, confirming comprehension through methods like teach-back, and being culturally sensitive further enhance communication and engage patients as active partners in their healthcare journey.

**5. Simplify Written Communication:** Written materials, a crucial component of patient education, should be selected or created in multiple languages, ensuring ease of understanding and actionability. Materials should be organized with informative headings, short sentences, and clear images that reinforce key messages. Establishing processes for material review with patients ensures that written communication aligns with their needs and promotes health literacy.

**6. Healthcare Navigation Support:** Improving support for navigating healthcare facilities requires designing signage that is easy to understand and use, providing alternatives to written and digital information, and assisting patients in accessing needed care. Simplifying healthcare bureaucracy and costs, along with making referrals easy, contributes to a patient-friendly healthcare system that enhances overall health literacy.

**7. Supporting Health Management Efforts:** Establishing processes for healthcare providers to collaboratively develop action plans with patients fosters a sense of shared responsibility and empowers patients in managing their health. Providing practical tools such as pill organizers, patient leaflets and clear guides for medication reinforces positive health behaviors, contributing to improved health outcomes.

The pursuit of patient-centric healthcare requires a holistic approach to integrating health literacy into every facet of organizational operations. From rigorous assessments to continuous staff training and the creation of welcoming environments, these strategies collectively contribute to a healthcare system that prioritizes clear communication, inclusivity, and patient empowerment. By adopting these comprehensive approaches, organizations can bridge the gap in health literacy, fostering informed decision-making and ultimately enhancing the overall quality of healthcare delivery.

**PANTHERx Rare Pharmacy's QR Code Initiative**

In outpatient care, the role of pharmacists as the last touchpoint before complex therapies is crucial. This pivotal moment offers a unique opportunity for pharmacists to provide comprehensive counseling, particularly for patients dealing with rare diseases [3]. However, the limitations of traditional education methods prompted PANTHERx Rare Pharmacy to adopt a dynamic approach by leveraging technology.

Traditional patient education methods, whether verbal, written, or through texted links, have proven inadequate. Studies indicate that patients often retain less than one-fifth of the information provided during counseling, highlighting the need for innovative approaches. The intricacies of rare disease treatments exacerbate these challenges. Despite employing virtual counseling, PANTHERx recognized the ongoing challenge of ensuring accessibility precisely when patients need it.

In response, PANTHERx Rare Pharmacy pioneered a groundbreaking initiative using Quick Response (QR) codes to deliver customized educational materials digitally. This innovation was born out of the necessity to provide timely and relevant education on the unique administration of pediatric neurology medication. Traditional distribution methods of instructional videos fell short in terms of awareness and accessibility [4]. The resurgence of QR codes, initially developed for inventory tracking in 1994, gained prominence during the COVID-19 pandemic and demonstrated versatility across various industries, including healthcare.

With 85% of American adults using smartphones, QR codes offer a user-friendly and accessible means to disseminate information [5]. The concept of "just-in-time" learning, providing information when specifically needed, found applications beyond hospital settings. QR codes, housing guidelines or instructional videos significantly reduce the time required to access information and allow for real-time updates.

PANTHERx Rare Pharmacy implemented a program attaching customized QR codes to patients' prescription labels for every medication fill. This case study delves into a specific rare disease population, emphasizing the seamless integration of QR codes into the patient's treatment journey [6]. These QR codes provide access to instructional videos, administration guidelines, adverse event management recommendations, and proper medication disposal instructions.

Patient recall of treatment information is crucial for managing chronic diseases. Studies reveal that patients often struggle to recall critical information, underscoring the need for innovative educational approaches [7]. By incorporating QR codes into prescription labels, PANTHERx aims to improve patient outcomes by providing accessible tools for patients to access educational information at their convenience. PANTHERx envisions expanding this initiative, tailoring QR codes to meet the unique needs of each patient's treatment journey. This approach recognizes the importance of patient-specific data in customizing individualized education, paving the way for improved patient outcomes and a higher quality of life for those with rare diseases.

The utilization of QR codes in patient education represents a transformative step for rare disease specialty pharmacies. PANTHERx Rare Pharmacy's innovative approach not only addresses the limitations of traditional education methods but also aligns with the evolving landscape of healthcare, emphasizing contactless and accessible solutions [8]. By leveraging technology to deliver information precisely when patients need it, QR codes have the potential to revolutionize patient education, enhance understanding, and ultimately improve outcomes for those navigating the complexities of rare diseases. As technology continues to advance, the integration of QR codes into patient care exemplifies a forward-thinking approach to healthcare delivery.

**Global Evolution of E-labeling Policies**

The global pharmaceutical landscape is undergoing a transformative shift with the digitization of labeling, commonly known as e-labeling. This comprehensive essay delves into the intricate details of e-labeling policies across various countries, exploring their evolution, key regulations, and the impact on healthcare information dissemination. The focus is divided into Tier 1 countries – Japan, Brazil, and Singapore – which have matured e-labeling policies, and Tier 2 countries – the European Union, the United States, Canada, and Taiwan – where policies are still in progress.

**Tier 1 Countries:**

**Japan:**

Japan's e-labeling journey began with the amendment of the Act on Securing Quality, Efficacy, and Safety of Products in 2019 [9]. This amendment mandated the replacement of physical package inserts with electronic versions. The transition period, effective from August 2021, allowed a two-year grace period for pharmaceutical companies to adapt, with the complete phasing out of paper inserts expected by July 2023. This move aligns with Japan's commitment to strengthen safety measures by implementing electronic access to package insert information.

In 2020, the Pharmaceuticals and Medical Devices Agency (PMDA) collaborated with Taiwan, highlighting the global nature of e-labeling initiatives. The emphasis on the environmental benefits and improved accessibility showcased a commitment to sustainable and user-friendly practices.



**Figure 01- Steps for viewing package insert**

PMDA, Pharmaceuticals and Medical Devices Agency [Japan] Created by Böhm Nielsen, et al.

**Brazil:**

In 2022, Brazil enacted Law No. 14.338, marking a significant leap in e-labeling policies [11]. The law mandated medicine package leaflets to be provided in digital format alongside the traditional written format. A QR code on the package inserts allows patients to access information digitally [12]. The introduction of a track-and-trace system under this law reflects Brazil's commitment to ensuring the safety and authenticity of medicines.

**Singapore:**

Singapore's Health Sciences Authority (HSA) embarked on its e-labeling journey in 2019 by introducing an initiative allowing the electronic distribution of package inserts and patient information leaflets (PILs) [13]. The guidelines published in 2021 further solidified the commitment, enabling sponsors to distribute HSA-approved package inserts and PILs in digital format [14]. The secure online system ensures compliance and facilitates a seamless transition toward e-labeling.

**Tier 2 Countries:**

**European Union:**

The European Union (EU) has been actively working on e-labeling under the umbrella of Electronic Product Information (ePI). The process began in 2017 with the publication of a report highlighting shortcomings in product information [15]. Subsequent collaborative efforts between the European Medicines Agency (EMA), national competent authorities, and other stakeholders resulted in the adoption of common standards in 2022 [16]. Member states like Spain, Sweden, and Belgium have initiated ePI for nationally authorized medicines, showcasing a harmonized yet adaptable approach.

**United States:**

The United States has been navigating the complexities of e-labeling since 2007 when the FDA proposed a rule. However, legislative roadblocks in 2015 and subsequent years hindered progress [17]. The proposed rule aimed to electronically distribute prescribing information, aligning with broader health information exchange standards. The lack of legislative changes has resulted in electronic distribution remaining a voluntary practice, with the FDA unable to pursue e-labeling actively [18].

**Canada:**

Canada's e-labeling journey is outlined in the draft guidance published in 2021, emphasizing the voluntary use of electronic platforms for prescription drug labels [19]. Health Canada's approach is supplementary to existing legal requirements, allowing sponsors to provide URLs or 2D barcodes on physical labels, directing users to electronic platforms [20]. The 2022 notice reinforces the voluntary nature of e-labeling, maintaining flexibility within the existing legal framework.

**Taiwan:**

Taiwan's approach to e-labeling has been pragmatic, starting with an application in 2016 that allowed end-users to access comprehensive information about medicines through barcode scanning. In 2022, Taiwan Food and Drug Administration (TFDA) introduced electronic systems for labels, initiating a pilot project to replace paper labeling for specific prescription medicines. This pilot demonstrates a proactive stance toward embracing structured e-labeling [21].

The global evolution of e-labeling policies underscores a collective commitment to enhancing accessibility, efficiency, and sustainability in healthcare information dissemination [22]. Tier 1 countries showcase successful implementation, emphasizing safety, environmental benefits, and improved access. Tier 2 countries, while facing challenges like legislative hurdles and diverse healthcare structures, are progressively moving towards a digitalized future. The ongoing efforts globally signify a paradigm shift towards a more interconnected, accessible, and sustainable healthcare ecosystem.

**Benefits and Value of E-labeling:**

The transition to e-labeling brings forth a multitude of benefits for various stakeholders in the healthcare ecosystem. For patients, the advantages include speedy access to updated information, portability, and multilingual support, ensuring better understanding of crucial drug information. The personalization of information retrieval based on previous searches adds another layer of empowerment for end-users.



**Figure 02 - Overview of benefits and values of e-labeling**

Created by Böhm Nielsen, et al.

**Regulatory efficiency** is a key driver for the integration of e-labeling standards. The traditional regulatory approval process, taking 8 to 12 months, is expected to be significantly streamlined, reducing time frames, and simplifying user testing. The ability to mitigate drug shortages by facilitating information exchange between regulatory agencies is particularly crucial, as witnessed during the COVID-19 pandemic.

The pharmaceutical industry stands to gain from the implementation of joint e-label standards into production and regulatory submissions. Optimizing manufacturing and supply chain practices, reducing regulatory observations during inspections, and embracing sustainable practices align with the United Nations' 17 sustainable development goals. One of the most significant environmental benefits of e-labeling is the reduction in paper waste. The estimated production of three billion paper labels annually in the US alone highlights the potential environmental impact. Digitization of labels supports smaller shipping packages, minimizes greenhouse gas emissions, and contributes to the conservation of approximately 4.8 million trees annually, aligning with the UN's sustainability goals.

**Pfizer: Global Health Literacy Partnerships**

Pfizer, as a global pharmaceutical powerhouse, has strategically embraced a commitment to advancing health literacy on a global scale through impactful partnerships. The company recognizes that health literacy is not a solitary endeavor but a collaborative effort that necessitates engagement with various stakeholders. Pfizer's collaborations with global health organizations, non-governmental organizations (NGOs), and governmental bodies underscore its dedication to fostering health literacy.

Pfizer's partnerships extend beyond the pharmaceutical realm, emphasizing a holistic approach to health. By supporting NGOs, Pfizer actively contributes to the development and dissemination of accessible health information [27]. These collaborative efforts focus on creating educational materials that are not only accurate and informative but also culturally sensitive. The partnership model allows Pfizer to tap into the expertise of these organizations, ensuring that health literacy initiatives are tailored to diverse populations with unique needs.

Furthermore, Pfizer's engagement with governmental bodies amplifies the impact of its health literacy initiatives. By aligning with public health agencies, Pfizer leverages its resources to contribute to national health literacy strategies. This collaborative approach facilitates the integration of health literacy principles into broader public health programs, creating a synergistic effect that extends the reach of Pfizer's initiatives. Pfizer's commitment to global health literacy through partnerships is a testament to its understanding that meaningful change requires collective action [39]. By actively participating in collaborative ventures, Pfizer not only enhances the health literacy landscape but also contributes to building a more informed and empowered global community.

**Johnson & Johnson: Digital Health Platforms**

Johnson & Johnson, a stalwart in the healthcare industry, has strategically leveraged digital health platforms to champion health literacy. The company's innovative approach recognizes the transformative potential of technology in disseminating educational content. Through interactive websites and mobile applications, Johnson & Johnson has created a dynamic digital ecosystem that serves as a reservoir of comprehensive health information [40].

The core of Johnson & Johnson's digital health platforms lies in their user-friendly nature, ensuring accessibility for individuals across diverse demographics. By offering interactive content, including multimedia resources and engaging visuals, the company has made health information more digestible and engaging. This approach is particularly crucial in an era where digital literacy is becoming inseparable from overall health literacy. The breadth of topics covered on Johnson & Johnson's platforms encompasses diseases, medications, and general health practices. The company's commitment to providing reliable and easy-to-understand information reflects a dedication to empowering individuals with knowledge. These digital initiatives serve as a bridge between complex medical information and lay audiences, fostering a culture where everyone can make informed decisions about their health. Johnson & Johnson's embrace of digital health platforms represents a strategic move towards democratizing health information. By utilizing technology as a conduit for health literacy, the company not only keeps pace with the evolving landscape but also ensures that information is delivered in a format that resonates with the digital-savvy generations.

**Novartis: Patient-Centric Educational Resources**

Novartis, a global pharmaceutical player, has taken a patient-centric approach in its health literacy initiatives. Recognizing the pivotal role of patients in managing their health, the company has invested in developing educational resources that cater specifically to the needs of diverse patient populations. The cornerstone of Novartis' patient-centric educational resources lies in their simplicity and relevance [41]. By creating materials that are easy to understand, culturally sensitive, and linguistically appropriate, Novartis ensures that individuals are equipped with the knowledge needed to actively participate in their healthcare decisions. The company's commitment to tailoring information to the unique needs of patients reflects an understanding that a one-size-fits-all approach does not suffice in the realm of health literacy.

Novartis' educational resources cover a spectrum of health conditions, ranging from chronic diseases to acute illnesses. The company's initiatives extend beyond medication information, encompassing broader aspects of disease management, lifestyle choices, and preventive measures. This comprehensive approach aligns with the notion that true health literacy goes beyond medication adherence and extends to overall well-being. Novartis' emphasis on patient-centric educational resources reflects a commitment to empowering individuals with the tools they need to navigate the complexities of their health journey. By recognizing the diversity of its audience and tailoring information accordingly, Novartis contributes to a culture of health literacy where every patient is equipped to make informed decisions about their well-being.

**Bayer: Making Science Make Sense (MSMS) Program**

Bayer, a global leader in the pharmaceutical and life sciences sectors, has pioneered the "Making Science Make Sense" (MSMS) program, contributing significantly to overall health literacy by fostering scientific literacy. This unique initiative sets Bayer apart in its commitment to addressing the foundational aspects of health understanding – scientific knowledge [42].

The MSMS program is an embodiment of Bayer's dedication to science education as a cornerstone of health literacy. By promoting scientific literacy, Bayer aims to equip individuals with the critical thinking skills needed to decipher complex health information. This proactive approach recognizes that an understanding of the scientific principles underpinning health contributes to more informed decision-making.

One of the distinctive features of Bayer's MSMS program is its focus on education at an early stage. By engaging with schools and educators, Bayer lays the groundwork for future generations to develop a solid understanding of science and health. This preventative approach aligns with the broader goals of health literacy – preventing misinformation and promoting a proactive stance towards health. Bayer's commitment to making science understandable and accessible extends beyond formal education. The company actively engages with communities, fostering a culture where scientific knowledge is not intimidating but rather empowering. By demystifying science, Bayer contributes to an environment where individuals feel confident in navigating health information, making choices aligned with scientific evidence.

**AbbVie: Patient Education Resources**

AbbVie, with a primary focus on chronic conditions, has emerged as a trailblazer in enhancing health literacy through comprehensive patient education resources. The company's initiatives go beyond merely providing information; they aim to empower patients managing chronic conditions with the knowledge needed to make informed decisions about their health. AbbVie's commitment to patient education is reflected in its diverse range of resources, including brochures, videos, and online platforms. These resources are designed to be accessible, clear, and culturally sensitive, recognizing the diverse demographics of individuals managing chronic health issues. By offering information in multiple formats, AbbVie ensures that patients can engage with the content in a way that suits their preferences and health literacy levels [43].

The focus of AbbVie's patient education resources extends to not only medication information but also broader aspects of disease management, lifestyle modifications, and coping strategies. The company recognizes that managing a chronic condition involves multifaceted decision-making, and health literacy plays a pivotal role in this process. AbbVie's proactive approach to patient education involves collaborating with healthcare professionals to develop materials that align with clinical insights. This ensures that the information provided is not only accurate but also relevant to the real-world challenges faced by patients. By actively engaging with patient communities, AbbVie contributes to fostering a culture where individuals are not passive recipients of healthcare information but active participants in their health journey. In essence, AbbVie's patient education resources reflect a commitment to addressing the unique challenges posed by chronic conditions. By equipping patients with comprehensive and accessible information, AbbVie contributes to enhancing health literacy in a population that often grapples with complex health decisions.

**6. Eli Lilly: Diabetes Health Equity Now!**

Eli Lilly's Diabetes Health Equity Now! program stands as a beacon in addressing health disparities related to diabetes. Focused on community outreach and educational events, this initiative takes a holistic approach to enhance health literacy specific to diabetes prevention, management, and early intervention [44].

Community outreach is a cornerstone of Eli Lilly's strategy, recognizing the importance of meeting people where they are. By actively engaging with communities, the program tailors its educational efforts to the unique needs and challenges faced by individuals affected by diabetes. This localized approach contributes to increased health literacy by ensuring that information is not only accessible but also culturally relevant.

The program's emphasis on early intervention adds a preventive dimension to health literacy. By educating individuals about the early signs and risk factors of diabetes, Eli Lilly seeks to empower communities to make informed choices that can positively impact their health outcomes. This proactive stance aligns with the broader goal of fostering a culture of health literacy that transcends reactive healthcare measures.

**7. Boehringer Ingelheim: Stroke Risk Awareness Campaigns**

Boehringer Ingelheim takes a targeted approach to health literacy through its Stroke Risk Awareness Campaigns. By disseminating accessible information through various channels, the company addresses a critical health concern – stroke. The multifaceted nature of these campaigns reflects Boehringer Ingelheim's commitment to improving health literacy on a broader scale [45].

Raising awareness about stroke risk factors is pivotal in enhancing health literacy, as it equips individuals with the knowledge needed for early recognition and prevention. Boehringer Ingelheim's campaigns leverage diverse communication channels, including digital platforms, community events, and healthcare settings, ensuring that the information reaches diverse demographics.

The company's commitment to health literacy aligns with a preventive healthcare paradigm. By focusing on awareness and education, Boehringer Ingelheim contributes to building a foundation of knowledge that empowers individuals to make lifestyle choices conducive to stroke prevention. This approach goes beyond traditional pharmaceutical initiatives, showcasing a holistic commitment to public health.

**8. Takeda: Global CSR Programs**

Takeda's dedication to global corporate social responsibility extends seamlessly into health literacy initiatives. Through strategic partnerships and projects, Takeda positions itself as a key player in promoting health education, emphasizing disease prevention, and wellness. This approach is particularly crucial in regions with limited access to information and healthcare resources [46].

The global scope of Takeda's corporate social responsibility (CSR) programs underscores the company's recognition of health literacy as a universal right. By actively engaging with communities, Takeda ensures that its health education initiatives are culturally sensitive and tailored to the specific needs of diverse populations.

Takeda's commitment to disease prevention aligns with a proactive health literacy narrative. The company recognizes that building health literacy involves not just disseminating information but fostering a comprehensive understanding of preventive measures. Through these initiatives, Takeda contributes to creating communities that are well-informed and empowered to take charge of their health.

**9. Merck KGaA: Healthy Living Programs**

Merck KGaA's investment in healthy living programs exemplifies a commitment to health literacy that extends beyond traditional pharmaceutical interventions. These programs, with their educational components, offer practical information on nutrition and physical activity, contributing to health literacy by encouraging individuals to make informed choices for a healthier lifestyle [47].

The emphasis on practical information sets Merck KGaA's initiatives apart. By providing actionable insights into nutrition and physical activity, the programs equip individuals with the tools needed to integrate health-conscious choices into their daily lives. This hands-on approach to health literacy reflects a nuanced understanding of the factors influencing individual behavior.

Merck KGaA's initiatives align with a broader narrative of holistic well-being. By addressing lifestyle factors, the company recognizes the interconnectedness of physical activity and nutrition with overall health. This comprehensive approach contributes to building a culture of health literacy that extends into various facets of individuals' lives.

**10. Gilead Sciences: Hepatitis C Education Initiatives**

Gilead Sciences takes a focused stance on health literacy through its Hepatitis C Education Initiatives. These initiatives, centering on prevention, testing, and treatment options, contribute significantly to health literacy by providing information that not only educates but also helps reduce stigma and encourages informed decision-making related to infectious diseases [48].

The public education aspect of Gilead Sciences' initiatives is instrumental in improving health literacy on infectious diseases. By disseminating information about prevention strategies and testing options, the company contributes to reducing the prevalence of Hepatitis C through informed decision-making. This aligns with the broader goal of fostering health-conscious communities.

Gilead Sciences' initiatives are characterized by their proactive nature. By addressing Hepatitis C comprehensively, from prevention to treatment, the company empowers individuals to take charge of their health. This approach contributes not only to individual health literacy but also to public health outcomes by creating a more informed and aware society.

**11. Vertex Pharmaceuticals: Cystic Fibrosis Patient Education**

Vertex Pharmaceuticals distinguishes itself by prioritizing patient education on cystic fibrosis. Through a multifaceted approach involving workshops, online resources, and educational materials, the company aims to elevate health literacy regarding this genetic disorder. Cystic fibrosis patients and their families are provided with comprehensive information about the disease, available treatment options, and lifestyle management [49].

The workshops conducted by Vertex Pharmaceuticals serve as interactive forums, fostering direct engagement with patients. This approach recognizes the importance of personalized education, tailoring information to the unique needs and queries of individuals affected by cystic fibrosis. By enhancing health literacy about this complex condition, Vertex Pharmaceuticals contributes to a more informed and empowered patient community.

Online resources developed by the company serve as accessible repositories of knowledge, ensuring that individuals can seek information at their convenience. This digital approach aligns with contemporary trends in health education and caters to diverse learning preferences. Additionally, the provision of educational materials further extends the reach of Vertex Pharmaceuticals' initiatives, creating a comprehensive ecosystem for fostering health literacy.

**12. Biogen: Alzheimer's Disease Awareness Campaigns**

Biogen assumes a leadership role in Alzheimer's disease awareness campaigns, recognizing the profound impact of neurodegenerative conditions on global health. The company's initiatives go beyond product-focused strategies, focusing on increasing public understanding of Alzheimer's disease. By disseminating information about early symptoms, risk factors, and the critical importance of early diagnosis, Biogen actively contributes to improved health literacy in the realm of neurodegenerative disorders [50].

The awareness campaigns orchestrated by Biogen address a critical gap in health literacy – the understanding of Alzheimer's disease as a complex condition. Through various communication channels, including digital platforms, community events, and healthcare settings, the company ensures that information reaches diverse demographics. This commitment to accessibility and inclusivity underscores Biogen's dedication to empowering communities with knowledge that can drive early intervention and informed decision-making.

Biogen's initiatives align with a broader narrative of destigmatizing neurodegenerative conditions and fostering a supportive ecosystem for affected individuals and their families. By actively participating in Alzheimer's disease awareness, Biogen contributes to a cultural shift that recognizes the importance of early detection and proactive management.

**13. Sun Pharmaceutical Industries: Skin Health Education**

Sun Pharmaceutical Industries stands out with its focus on skin health education, recognizing the significance of dermatological well-being in the broader context of overall health [51]. The company's initiatives are designed to provide information on various skin conditions, preventive measures, and available treatment options. By empowering individuals with knowledge about their skin health, Sun Pharmaceutical Industries contributes to the enhancement of overall health literacy.

Skin health is often overlooked despite its integral role in an individual's well-being. Sun Pharmaceutical Industries addresses this gap by disseminating information through diverse channels, including educational campaigns, online resources, and collaborations with healthcare professionals. These initiatives serve to bridge the knowledge divide and empower individuals to make informed decisions regarding their skin health.

The educational materials produced by Sun Pharmaceutical Industries serve as valuable resources for individuals seeking clarity on dermatological issues. Whether it is information about common skin conditions, preventive measures, or insights into available treatments, the company's commitment to health literacy manifests in the comprehensiveness and accessibility of these resources.

**14. Regeneron: Science Education Initiatives**

Regeneron takes a distinctive approach to health literacy by championing science education initiatives. While not directly tied to specific pharmaceutical products, these programs contribute to a broader understanding of health-related scientific concepts [52]. By fostering scientific literacy, Regeneron promotes a culture of curiosity, critical thinking, and knowledge that transcends individual health conditions.

The science education initiatives undertaken by Regeneron extend beyond the traditional pharmaceutical purview, reflecting a commitment to the broader community. The programs often involve collaborations with educational institutions, community organizations, and other stakeholders, aiming to ignite and sustain an interest in scientific disciplines. This holistic approach aligns with the company's vision of contributing to a society that values and understands the scientific underpinnings of health.

Regeneron's commitment to science education also resonates with the company's ethos of corporate social responsibility. By investing in initiatives that go beyond immediate product-centric goals, Regeneron contributes to shaping a more scientifically literate society capable of making informed decisions about health-related issues.

**15. AstraZeneca: Cardiovascular Health Awareness Programs**

AstraZeneca takes a proactive stance on health literacy through its cardiovascular health awareness programs. These initiatives emphasize prevention and management, addressing a critical facet of public health. By disseminating information through multiple channels, including digital platforms, community engagement, and healthcare partnerships, AstraZeneca enhances health literacy related to heart health [53].

The cardiovascular health awareness programs orchestrated by AstraZeneca align with a preventive healthcare paradigm. By educating individuals about the risk factors associated with cardiovascular conditions and promoting heart-healthy practices, the company contributes to the overall well-being of communities. The comprehensive nature of these programs reflects AstraZeneca's commitment to addressing health literacy as a multifaceted endeavor.

Digital platforms play a crucial role in AstraZeneca's approach, ensuring that information reaches individuals in diverse demographics. The company recognizes the importance of leveraging technology to create a wider impact, embracing a contemporary approach to health education. Additionally, community engagement initiatives foster direct interaction, tailoring information to the specific needs of diverse populations.

**16. Sanofi: Vaccination Education Campaigns**

Sanofi distinguishes itself through its active engagement in vaccination education campaigns. Recognizing the importance of immunization in preventing infectious diseases, the company focuses on providing comprehensive information to the public [54]. Sanofi's initiatives go beyond the traditional promotion of vaccines; they address common misconceptions, emphasize the societal impact of vaccination, and foster a deeper understanding of preventive medicine.

The vaccination education campaigns orchestrated by Sanofi are designed to be accessible to diverse populations. Through digital platforms, community events, and collaborations with healthcare professionals, the company ensures that accurate information reaches individuals from various demographics. By demystifying the science behind vaccines and promoting transparency, Sanofi contributes significantly to global health literacy in the context of preventive healthcare.

Sanofi's commitment to vaccine education aligns with broader public health goals, fostering a culture that values immunization as a cornerstone of disease prevention. The company recognizes that enhancing health literacy about vaccines is pivotal not only for individual well-being but also for building resilient communities that understand the collective benefits of vaccination.

**17. GlaxoSmithKline: Respiratory Health Education**

GlaxoSmithKline (GSK) focuses its health literacy initiatives on respiratory health education. With a specific emphasis on conditions like asthma and Chronic Obstructive Pulmonary Disease (COPD), GSK aims to empower individuals with knowledge about respiratory diseases. By providing accessible resources and educational materials, the company contributes to improved health literacy in a critical area of public health [55].

GSK's commitment to respiratory health education is evident in its multifaceted approach. The company leverages various channels, including digital platforms, healthcare partnerships, and community outreach, to disseminate information about respiratory conditions. Recognizing that respiratory health is a global concern, GSK's initiatives are designed to be inclusive and adaptable to diverse cultural and linguistic contexts.

The resources offered by GSK not only educate individuals about the nature of respiratory diseases but also emphasize preventive measures and management strategies. By addressing common misconceptions and promoting proactive health practices, GSK actively contributes to fostering a population that is well-informed about respiratory health.

**18. Roche: Cancer Patient Support Programs**

Roche takes a holistic approach to health literacy by initiating cancer patient support programs. Acknowledging the complexity and emotional impact of a cancer diagnosis, the company provides educational resources to individuals and families affected by cancer. Roche's initiatives extend beyond medical information, encompassing practical guidance, emotional support, and insights into treatment options [56].

The cancer patient support programs initiated by Roche reflect a commitment to empowering patients through knowledge. The resources offered cover various aspects of the cancer journey, from understanding the disease and available treatments to coping strategies and support services. By addressing the informational and emotional needs of patients, Roche actively contributes to enhancing health literacy in the oncology domain.

Roche's approach to cancer patient support emphasizes collaboration with healthcare professionals, patient advocacy groups, and community organizations. This collaborative effort ensures that the provided information is not only accurate but also aligned with the evolving needs of individuals navigating the complexities of cancer care.

**19. Astellas Pharma: Patient Advocacy Initiatives**

Astellas Pharma stands out through its commitment to patient advocacy initiatives. Recognizing the pivotal role of patient organizations in educating and empowering individuals, Astellas actively engages in supporting advocacy groups. By fostering partnerships and contributing resources, the company enhances health literacy by amplifying the voices of patients and their families.

Astellas Pharma's patient advocacy initiatives are diverse, spanning various therapeutic areas. The company recognizes that patient education is a dynamic process that involves addressing the unique challenges faced by different patient communities. Through collaborations, Astellas ensures that the initiatives are not only informative but also tailored to the specific needs and concerns of diverse populations.

The impact of Astellas' patient advocacy initiatives extends beyond immediate health concerns, contributing to a culture of patient-centered healthcare. By actively involving patients in healthcare decisions and providing resources that facilitate informed choices, Astellas plays a crucial role in advancing health literacy at the intersection of pharmaceutical innovation and patient empowerment.

**20. Moderna: Vaccine Information Platforms**

Moderna contributes to health literacy through its active participation in vaccine information platforms. In the context of the emerging mRNA vaccine technology, Moderna emphasizes transparency and accessibility in disseminating information [57]. By providing clear insights into vaccine science, addressing common questions, and engaging with the public through digital platforms, Moderna actively contributes to health literacy related to novel vaccine technologies.

The vaccine information platforms established by Moderna serve as hubs of knowledge, offering not only information about specific vaccines but also broader insights into the science behind mRNA technology. The company recognizes the importance of public understanding in building trust and facilitating informed decision-making, especially in the context of rapidly evolving vaccine landscapes.

Moderna's initiatives in vaccine education are characterized by a commitment to open communication. By proactively addressing concerns, providing information, and leveraging digital platforms for widespread dissemination, Moderna exemplifies a contemporary approach to health literacy in the context of cutting-edge medical technologies.

**The Vital Role of Pharmacists in Addressing Health Literacy Challenges**

Pharmacists are uniquely positioned to contribute significantly to improving health literacy and addressing its associated challenges [23]. Here are some key roles that pharmacists play in this regard:

**1. Clear Communication and Education:** Pharmacists can enhance health literacy by adopting clear communication strategies. This involves simplifying complex medical information, using plain language, and avoiding jargon [24]. During medication counseling sessions, pharmacists can educate patients about their prescribed medications, ensuring they understand the purpose, dosage, potential side effects, and the importance of adherence.

**2. Accessible Medication Labeling:** Pharmacists can play a crucial role in designing clear and accessible medication labels. Simplifying language, incorporating visual aids, and ensuring that instructions are easy to follow can greatly improve patient understanding [25]. Clear labeling is essential in promoting proper medication administration and reducing the risk of errors.

**3. Empathetic Patient Engagement:** Understanding patients' individual needs and concerns is vital for addressing health literacy challenges. Pharmacists can employ empathetic communication and active listening, creating a supportive environment where patients feel comfortable asking questions and seeking clarification. This approach helps build trust and enhances patients' confidence in managing their health.

**4. Utilizing Technology:** Pharmacists can leverage technology to support health literacy initiatives. Digital platforms, mobile apps, and online resources can provide accessible information about medications, health conditions, and wellness tips. Automated reminders for medication adherence and virtual consultations can further facilitate patient engagement and education.

**5. Community Outreach and Education Programs:** Pharmacists can actively engage in community outreach programs to promote health literacy. Organizing workshops, seminars, and health fairs in collaboration with local communities helps disseminate valuable health information.

**6. Cultural Competence:** Pharmacists need to be culturally competent, recognizing the diversity of patient populations [26]. Tailoring communication and education to align with cultural preferences and languages spoken by patients enhances understanding and promotes health literacy across diverse communities.

The vital role of pharmacists in addressing health literacy challenges involves multifaceted efforts, including clear communication, education, leveraging technology, community engagement, and collaboration with other healthcare providers. By actively participating in these initiatives, pharmacists contribute to empowering patients, reducing health disparities, and ultimately improving overall health outcomes.

**Universal Awareness and Daily Health Management:**

**1. Promoting General Awareness:**

 Emphasizing the importance of health literacy is essential for promoting a universal understanding of health in individual and community well-being. Every individual should recognize the significance of acquiring, comprehending, and applying health information throughout their lives [32].

**2. Continuous Health Management:**

 Health literacy encourages a proactive approach to health management, extending beyond episodic visits to healthcare providers. By integrating health literacy into daily life, individuals can prevent health issues, safeguard their well-being, and enhance their ability to manage health challenges effectively.

Health literacy emerges as a linchpin for individual and societal health. The disparities associated with low health literacy underscore the urgent need for comprehensive programs, awareness campaigns, and tailored interventions to promote health literacy across diverse populations. In doing so, individuals can be empowered to make informed decisions, actively engage with healthcare services, and contribute to a more equitable and resilient healthcare landscape [33].

**Challenges in Health Literacy:**

Health literacy poses a formidable challenge, even for individuals who possess strong reading and numerical skills. The multifaceted nature of health information, coupled with the necessity to comprehend medical terms, evaluate risks and benefits, and interpret statistics, can create significant barriers to understanding [34]. Several scenarios exemplify the complexities individuals may encounter:

**1. Diagnosis of Serious Diseases:**

 A diagnosis of a serious disease can induce confusion and fear. Understanding the implications of the diagnosis, and potential outcomes requires adequate health literacy. The emotional impact compounds the need for clear and accessible health information.

**2. Management of Complex Health Conditions:**

 Health literacy becomes particularly crucial when individuals are grappling with health conditions that are difficult to manage. Effective self-management necessitates a deep understanding of the condition, treatment protocols, and lifestyle adjustments. Inadequate health literacy can impede individuals from actively participating in their care.

**3. Voting on Health Issues:**

 When individuals participate in democratic processes involving health-related issues, they may encounter technical information that is unfamiliar. The ability to decipher and critically assess this information is pivotal for making well-informed decisions that impact the entire community.

**Poor Health Literacy Problems:**

**1. Threat to Economic Stability:**

 Poor health literacy contributes a substantial risk to the economic stability of a country. As healthcare costs escalate with a growing population, the repercussions of inadequate health literacy manifest in increased healthcare utilization, suboptimal health outcomes, and a strain on resources [35].

**2. Challenges in Accessing Reliable Information:**

 Overpopulation in countries like India exacerbates the difficulty in accessing reliable health information and quality healthcare. The high rates of poverty and illiteracy, especially in rural areas, contribute to poor health literacy among the public.

**3. Gender Disparities in Health Literacy:**

 In Indian society, gender disparities, particularly the unequal treatment of women leads to a poor health literacy. Studies highlight that higher-educated and socially elevated women correlate with improved community health. Overcoming gender-related barriers is crucial for enhancing health literacy on a broader scale.

**4. Communication Challenges:**

 Disseminating health information which is complicated to understand exacerbates the problem of better health literacy. If information about health services is confusing, unfamiliar, or contradictory, it creates a health literacy problem. Clear, accessible, and culturally sensitive communication is essential to bridge this gap.

In addressing these challenges, interventions must extend beyond traditional literacy programs, encompassing targeted health literacy initiatives. Public health campaigns, educational programs, and policy changes that prioritize clear communication can contribute to raising health literacy levels and, subsequently, improving health outcomes on both an individual and societal level.

**Promotion Strategies of Health Literacy**

**1. Illiteracy:**

 Education Initiatives: Implement targeted educational programs to improve literacy rates, especially among women. Address regional language variations to ensure that health information is accessible even at the most basic literacy levels [36].

 Disease-Specific Education: Develop focused campaigns for diseases like tuberculosis, providing comprehensible information about treatment duration and consequences of non-compliance. Combatting illiteracy is pivotal in preventing multi-drug resistance.

**2. Poverty:**

 Economic Empowerment: Implement measures to alleviate poverty, recognizing its direct impact on health literacy. Programs focused on economic empowerment can indirectly contribute to improved health outcomes by creating conditions conducive to learning about health concerns.

**3. Gender Inequality and Discrimination:**

 Promoting Gender Equality: Advocate for gender equality through awareness campaigns and policy initiatives.

 Family Planning Education: Enhance family planning education, targeting both men and women. Reducing infant mortality rates involves educating women about family planning options, spacing births, and proper nutrition for children.

**4. Mistrust of the Medical System:**

 Training and Staffing: Invest in training and hiring properly qualified staff in the public healthcare system. Ensuring that healthcare professionals are competent fosters trust in the system.

 Community Engagement: Implement community engagement programs to build trust and bridge gaps between healthcare providers and the public. Addressing misconceptions and fostering open communication can improve perceptions of the medical system.

**5. Access to Healthcare Facilities:**

 Infrastructure Improvement: Upgrade facilities in Primary Health Centres and sub-centres, ensuring they have adequate resources, electricity, and essential medicines. Enhance the overall quality of healthcare services in government-run facilities.

 Reducing Barriers: Address barriers such as long waiting times and inconvenient opening hours. Implement measures to make healthcare services more accessible, particularly for women who face additional restrictions.

**6. Preference for Private Healthcare:**

 Public Awareness: Launch public awareness campaigns emphasizing the quality and accessibility of government-run healthcare services. Dispel misconceptions and highlight the importance of seeking timely and affordable care.

 Affordability Measures: Implement policies to make government-run services more affordable. This can include subsidies, insurance programs, or other financial incentives to encourage utilization.

Promoting Clear Communication: Health professionals should use plain language and avoid jargon when communicating with patients. Clear and simple language helps in better understanding which includes simplifying written materials, instructions, and verbal communication.

Utilizing Technology: In the modern era, technology plays a vital role in disseminating health care information. Leveraging digital platforms, mobile applications, and other technological tools can enhance accessibility and understanding of health-related information. User-friendly resources were catered to individuals with varying levels of health literacy is essential [37].

Community Engagement and Partnerships: Engaging communities in health initiatives and forming partnerships with community organizations can enhance the reach and effectiveness of health literacy programs. Tailoring interventions to specific cultural and linguistic needs of communities can make health information more accessible.

Education and Training for Health Professionals: Providing education and training for healthcare providers on effective communication strategies and health literacy principles is crucial. Health professionals should be equipped with the skills to communicate complex information in an understandable manner and be aware of the diverse needs of their patients.

By implementing these strategies, individuals, communities, and healthcare systems can contribute to improving health literacy levels and, consequently, enhance overall health outcomes.

**Global Society Health Response for Improved Health Literacy**

To enhance health literacy on a societal level, a comprehensive approach is crucial. The following strategies encompass policies, programs, and funding considerations:

**1. Communication Skills for Health Professionals:** Media and public health professionals should possess the ability to articulate complex health issues in an understandable manner. Training programs should emphasize effective communication between professionals and the public [38].

**2. Clarity and Accuracy in Health Information:** Health information should be tailored to diverse cultures and languages to ensure accessibility. Emphasize the importance of clear and accurate health communication in both media and healthcare settings.

**3. Public Health Infrastructure to Support Healthy Behavior:** Establish infrastructure in workplaces, communities, and educational institutions that promotes and facilitates access to health information. Implement policies that create environments conducive to healthy behaviors.

**4. Individual focused Health Information Services:** Ensure that health information services were tailored to the individual's needs, considering cultural nuances and language preferences. Encourage a patient-centered approach in healthcare delivery.

**5. Promotion of Lifelong Learning for Good Health:** Develop initiatives that promote continuous health education throughout an individual's life. Encourage a culture of learning and staying informed about health matters.

**6. Creation and Distribution of Accurate Health and Safety Data:** Implement mechanisms for the creation and widespread distribution of accurate, actionable, and accessible health and safety information.

**7. Policy Changes and Guidelines:** Advocate for policy changes and the development of guidelines that prioritize and improve health literacy at various levels.

**8. Research and Evidence-Based Practices:** Invest in basic research to understand health literacy challenges and develop evidence-based interventions and practices. Regularly evaluate and refine existing interventions based on research findings.

**References:**

1. Health Literacy in India still low – The Softcopy. (2023, February 7). <https://thesoftcopy.in/2023/02/07/health-literacy-in-india-still-low/>

2. Strategies to Improve Organizational Health Literacy. (2021). Psnet.ahrq.gov. <https://psnet.ahrq.gov/primer/strategies-improve-organizational-health-literacy>

3. Richard C, Glaser E, Lussier MT. Communication and patient participation influencing patient recall of treatment discussions. Health Expect 2017;20(4):760-70.

4. QR Code development story, Technologies, DENSO WAVE. 2022. QR Code development story｜Technologies｜DENSO WAVE. [online] Available at: <https://www.denso-wave.com/en/technology/vol1.html>

5. Nyu.edu. 2022. [online] Available at: <https://www.nyu.edu/content/dam/nyu/studentAffairs/images/Explained/qr_code.pdf>

6. U.S. Smartphone Industry Statistics [2022]: Facts, Growth, Trends, And Forecasts – Zippia. Zippia.com. https://www.zippia.com/advice/us-smartphone-industry-statistics/.

7. Timmons J. The Massive List of Use Cases for QR Codes in Healthcare — Etactics. Etactics | Revenue Cycle Software. https://etactics.com/blog/qr-codes-in-healthcare.

8. Karia CT, Hughes A, Carr S. Uses of quick response codes in healthcare education: a scoping review. BMC Med Educ 2019;19(1):456.

9. Council for International Organizations of Medical Sciences. CIOMS cumulative pharmacovigilance glossary, Version 1.1. Dated 3 June 2021. <https://cioms.ch/wp-content/uploads/2021/03/CIOMS-Cumulative-Glossary_v1.1_3Jun2021.pdf>

10. Firoz Babu, P. (2022). Health Literacy in India -A brief Review. 9, 59. <https://www.jetir.org/papers/JETIR2210206.pdf>

11. Shinobu U. Latest trend of pharmaceutical and medical device regulation in Japan. Presented at: 8th Joint Conference of Taiwan and Japan on Medical Products Regulation; 15 October 2020. Accessed 4 Feb 2024. <https://www.pmda.go.jp/files/000236925.pdf>

12. National Congress of Brazil. [In Portuguese] Law No. 14.338/2022. Published on 12 May 2022. <https://www.in.gov.br/en/web/dou/-/lei-n-14.338-de-11-de-maio-de-2022-399315842>

13. Rocha B, et al. Digital health transformation: The new Brazilian law on digital drugs leaflets. Dated 17 May 2022. <https://www.lexology.com/library/detail.aspx?g=f31d6c6f-36d7-4a9e-9404-3ae327c8fece>

14. Health Sciences Authority [Singapore]. Appendix 7 - Points to consider for Singapore labelling. Uploaded 29 April 2022. <https://www.hsa.gov.sg/docs/default-source/hprg-tpb/guidances/appendix-7_points-to-consider-for-singapore-labelling.pdf>

15. García Burgos J. Background of ePI initiative. Presented at: Information workshop on electronic product information (ePI); not dated. <https://www.ema.europa.eu/en/documents/presentation/presentation-background-epi-initiative-j-garcia_en-0.pdf>

16. European Medicines Agency. Electronic product information for medicines in the EU. Report from an EMA–HMA–EC workshop; 28 November 2018. <https://www.ema.europa.eu/en/documents/report/report-european-medicines-agency-ema/heads-medicines-agencies-hma/european-commission-ec-workshop-electronic-product-information-epi_en.pdf>

17. Griffiths L-S, Mills SR. Patient labeling 101 [presentation, Center for Drug Evaluation]. Not dated. <https://www.fda.gov/media/88986/download>

18. Food and Drug Administration. Electronic distribution of prescribing information for prescription drug products [public hearing]. Posted 11 June 2007. <https://www.regulations.gov/document/FDA-2007-N-0363-0014>

19. Axelrad JA. Congress: Stand up to the paper lobby and abolish outdated paper labeling for clinicians. STAT. Published 23 April 2021. <https://www.statnews.com/2021/04/23/congress-abolish-outdated-paper-prescribing-for-clinicians/>

20. Health Canada. Electronic media in prescription drug labelling guidance. Current as of 18 May 2021. <https://www.canada.ca/en/health-canada/services/drugs-health-products/public-involvement-consultations/drug-products/electronic-media-prescription-drug-labelling/guidelines.html>

21. Health Canada. Notice – Interim implementation of electronic labelling for human prescription drugs. Dated 22 April 2022. <https://www.canada.ca/en/health-canada/services/drugs-health-products/drug-products/announcements/notice-interim-implementation-electronic-labelling-human-prescription-drugs.html>

22. Ministry of Health and Welfare [Taiwan]. Pharmaceutical Affairs Act. Article 25. Last updated 31 January 2018. <https://law.moj.gov.tw/ENG/LawClass/LawAll.aspx?pcode=L0030001>

23. Cutilli C. C., Bennett I. M. 2009. Understanding the health literacy of America. Results of the National Assessment of Adult Literacy. Orthopaedic Nursing, 28, 27–32.

24. “Improving Health Literacy.” Improving Health Literacy, [www.who.int/activities/improving-health-literacy](http://www.who.int/activities/improving-health-literacy)

25. AMA Ad Hoc Committee on Health Literacy for the Council on Scientific Affairs, 1999. “Health Literacy:Report of the Council on Scientific Affairs.” JAMA, 281(6): 552–57. <https://doi.org/10.1001/jama.281.6.552>

26. What is the single-item literacy screener (SILS) questionnaire? CODE Technology | We Collect Patient Reported Outcomes. <https://www.codetechnology.com/blog/single-item-literacy-screener-sils-questionnaire/> Published November 22, 2022.

27. The newest vital sign. Pfizer. <https://www.pfizer.com/products/medicine-safety/health-literacy/nvs-toolkit> Published 2022.

28. Parker, R. M., et al. (2003). Health literacy: A prescription to end confusion. National Academies Press.

29. Parker, R. M., et al. (2009). Correspondence: H1N1 influenza and acetaminophen use. New England Journal of Medicine, 361(27), 2677-2678.

30. Budnitz, D. S., et al. (2009). Preventing acetaminophen overdose: A new action plan to protect consumers. American Journal of Preventive Medicine, 37(3), 234-238.

31. Woodcock, J. (2009). Statement on Acetaminophen in Over-the-Counter (OTC) Drug Products. U.S. Food and Drug Administration.

32. Centre for Disease Control and Prevention. (n.d.). Health Literacy Basics.

33. Journal of Public Health Management and Practice: November/December 2021 - Volume 27 - Issue Supplement 6.

34. National Academic Press, Institute of Medicine (US) Committee on Health Literacy; Nielsen-BohlmanL, Panzer AM, Kindig DA.

35. Evaluation of Health Literacy Status Among Patients in a Tertiary Care Hospital in Coastal Karnataka, India, by Rathnakar U.P, MadhuriBelman, Ashwin Kamath, Unnikrishnan B, Ashok Shenoy K, Udupa A.L.

36. New India Literacy Programme, National Education Policy 2020, by Drishti.

37. National Institute for Health Literacy. (2008). What is health literacy?

38. Yin, H. S., Dreyer, B. P., van Schaick, L., Foltin, G. L., Dinglas, C., & Mendelsohn, A. L. (2008). Randomized controlled trial of a pictogram-based intervention to reduce liquid medication dosing errors and improve adherence among caregivers of young children. Archives of Pediatric Adolescent Medicine.

39. Health Literacy | Pfizer. (n.d.). Www.pfizer.com. <https://www.pfizer.com/products/medicine-safety/health-literacy>

40. Digital solutions. (n.d.). Content Lab (U.S). <https://www.jnj.com/discover-j-j/digital-solutions> [Accessed 4 Feb 2025].

41. Care Management for Patient Resources | Novartis | HCP. (n.d.). Www.hcp.novartis.com. Retrieved February 4, 2025, from <https://www.hcp.novartis.com/care-management/patient-resources/>

42. Making Science Make Sense - Crop Science India. (2015). Bayer.in. <https://www.cropscience.bayer.in/Social-Commitment/MSMS>

43. AbbVie Access® | Support and Resources. (n.d.). AbbvieAccess. Retrieved February 4, 2024, from <https://www.abbvieaccess.com/patient-resources>

44. Lilly Cuts Insulin Prices by 70% and Caps Patient Insulin Out-of-Pocket Costs at $35 Per Month | Eli Lilly and Company. (2023, March 1). Eli Lilly and Company. <https://investor.lilly.com/news-releases/news-release-details/lilly-cuts-insulin-prices-70-and-caps-patient-insulin-out-pocket>

45. (2024). Boehringer-Ingelheim.com. <https://www.boehringer-ingelheim.com/in/media-overview/press-releases/boehringer-ingelheim-indias-stroke-awareness-campaign-enters-guinness#:~:text=The%20company>

46. CSR Partnerships | Takeda Pharmaceuticals. (2024). Takeda.com. <https://www.takeda.com/about/corporate-responsibility/corporate-giving/programs-in-action/>

47. Health for All | Merck. (2023). Merckgroup.com. https://www.merckgroup.com/en/sustainability/health-for-all.html

48. HCV Elimination | Gilead. (n.d.). Www.gilead.com. Retrieved February 4, 2025, from <https://www.gilead.com/purpose/advancing-global-health/hcv-elimination#:~:text=The%20FOCUS%20Program%20is%20a>

49. Vertex Pharmaceuticals | Patients | Cystic Fibrosis. (n.d.). Vertex. Retrieved February 5, 2025, from <https://www.vrtx.com/en-us/patients/cystic-fibrosis/>

50. Biogen and Eisai launch multiple initiatives to help patients with Alzheimer’s disease access ADUHELMTM | Biogen. (n.d.). Investors.biogen.com. <https://investors.biogen.com/news-releases/news-release-details/biogen-and-eisai-launch-multiple-initiatives-help-patients>

51. Home. (n.d.). Sun Pharmaceutical Industries Ltd. <https://sunpharma.com/>

52. Regeneron: Fostering the Next Generation of Scientists. (n.d.). Www.regeneron.com. Retrieved February 4, 2024, from <https://www.regeneron.com/responsibility/sustainable-communities/fostering-the-next-generation#:~:text=Our%20Commitment%20to%20Science%20Research>

53. AstraZeneca. (n.d.). Our therapy areas - AstraZeneca. Www.astrazeneca.com. <https://www.astrazeneca.com/our-therapy-areas.html>

54. Pasteur, S. (n.d.). Sanofi Pasteur Launches Nationwide Education Campaign to Help Parents Make Informed Decisions about Immunization. Www.prnewswire.com. Retrieved February 4, 2025, from <https://www.prnewswire.com/news-releases/sanofi-pasteur-launches-nationwide-education-campaign-to-help-parents-make-informed-decisions-about-immunization-134030683.html>

55. Committed to a brighter future for people with respiratory disease GSK Respiratory Contents. (n.d.). <https://us.gsk.com/media/3299/respiratory-brochure.pdf> Retrieved February 4, 2025.

56. Roche | The Blue Tree Program. (n.d.). Www.rocheindia.com. Retrieved February 4, 2025, from <https://www.rocheindia.com/about/blue-tree-program#:~:text=Roche%20Pharma%20India>

57. Moderna’s mRNA Platform. (n.d.). Moderna. <https://www.modernatx.com/power-of-mrna/modernas-mrna-platform>