REVIEW ARTICLE

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A Scoping Review to Refine A Framework for Self-Consumption of Herbal and Dietary Supplement among the Older Adults

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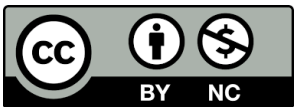


ABSTRACT

Background: Older adults in Malaysia increasingly use herbal and dietary supplements (HDS), often alongside conventional medicine, despite the potential risks of adverse herb-drug interactions and low disclosure rates to healthcare professionals. Current safety frameworks lack specific stakeholder role definitions and clinical integration protocols. This scoping review aimed to map and synthesise evidence regarding the roles of stakeholders, including the elderly, caregivers, healthcare providers, and regulatory bodies, to refine a framework for the safe self-consumption of HDS among the elderly in Malaysia.
Methods: A systematic literature search was conducted across five databases (Scopus, EBSCO, PubMed, Science Direct, and Google Scholar) for studies published between 2015 and 2026.
Results: Following PRISMA-ScR guidelines, 30 relevant articles were selected for final data extraction. The results suggest that safety cannot rely on individual choice alone it requires a "shared responsibility" where healthcare providers move from passive observers to active screeners, and systemic bodies mandate the integration of HDS documentation into routine clinical workflows.
Conclusion: The refined framework emphasises shared responsibility for HDS safety, with pharmacists and other healthcare providers assuming proactive roles in screening, counselling, and monitoring. Integrating routine HDS screening and documentation into clinical practice may strengthen communication, facilitate early identification of potential herb–drug interactions, and promote safer HDS use among older adults.

Keywords: Herbal Supplement; Dietary supplement; Self consumption; Elderly; Safety

INTRODUCTION

The global population is aging rapidly, with a growing proportion of older adults using herbal and dietary supplements (HDS) as well as complementary and alternative medicine (CAM). For many older adults, taking these supplements is seen as a positive way to stay healthy, boost their immune systems, and manage long-term health problems like cancer, kidney disease, or fibromyalgia (1–4). Because of this, the use of these products is very high, with some studies showing that up to 95% of certain older adults use them (5,6).

However, this high usage creates a serious safety concern. Many older adults choose and take supplements on their own, often following advice from family, friends, or social media instead of talking to a doctor (7,8). This leads to a transparency gap, where a huge number of elderly patients, between 44.5% and 82% do not tell their healthcare providers that they are using HDS (1,9,10). At the same time, many doctors do not ask about supplement use because they are busy or feel they don't have enough evidence-based information to give advice (11).

This lack of communication may compromise patient safety. As people get older, their bodies become less efficient at clearing substances through the liver and kidneys, which can turn natural products into toxic hazards (12). There have been documented cases of liver injury and kidney damage caused by these supplements (13,14). Furthermore, supplements may interfere with medications like blood thinners or thyroid drugs, which can cause bleeding problems or make the treatment less effective (4,15). Even helpful supplements like probiotics need professional supervision to make sure they are used correctly for frail patients (16,17).

Currently, there is a knowledge-vulnerability gap because many patients simply do not realize that these products can be toxic (18). Although interventions such as shared decision-making and targeted safety consultations have been shown to reduce unsafe supplement use, their implementation remains limited (19,20). This is particularly concerning given the widespread use of HDS and the limited integration of HDS-related information into formal healthcare regulations and documentation systems (21,22). In response, governments are increasingly recognising HDS safety as an important public health priority, as reflected in initiatives such as the Malaysian National Policy on Traditional and Complementary Medicine (9,21).

To address these issues, this scoping review aims to systematically synthesise evidence regarding the roles of key stakeholders, including older adults, caregivers, healthcare providers, and regulatory bodies, to refine a framework for the safe use of herbal and dietary supplements (HDS) among older adults in Malaysia. By integrating current evidence on HDS use patterns, non-disclosure barriers, and systemic gaps, this review identifies the necessary operational adjustments to transition the framework from a theoretical model into a practical, evidence-based tool for clinical application (25–28).

To ensure clarity and consistency throughout this review, key terms are defined and differentiated based on their contextual application. HDS serve as the primary focus of this review, encompassing plant-based products, vitamins, minerals, amino acids, and specialty nutritional substances consumed orally. CAM acts as a broad umbrella term representing medical and health practices not traditionally part of conventional allopathic medicine. Meanwhile, Traditional Medicine (TM)/Traditional and Complementary Medicine (T&CM) encompasses indigenous, culturally rooted health practices and preparations, such as local traditional systems recognized under national policy governance. Finally, Complementary and Integrative Medicine (CIM)/Complementary Medicine (CM) are terms used in specific clinical literature to describe combining conventional medical treatments with complementary therapies.

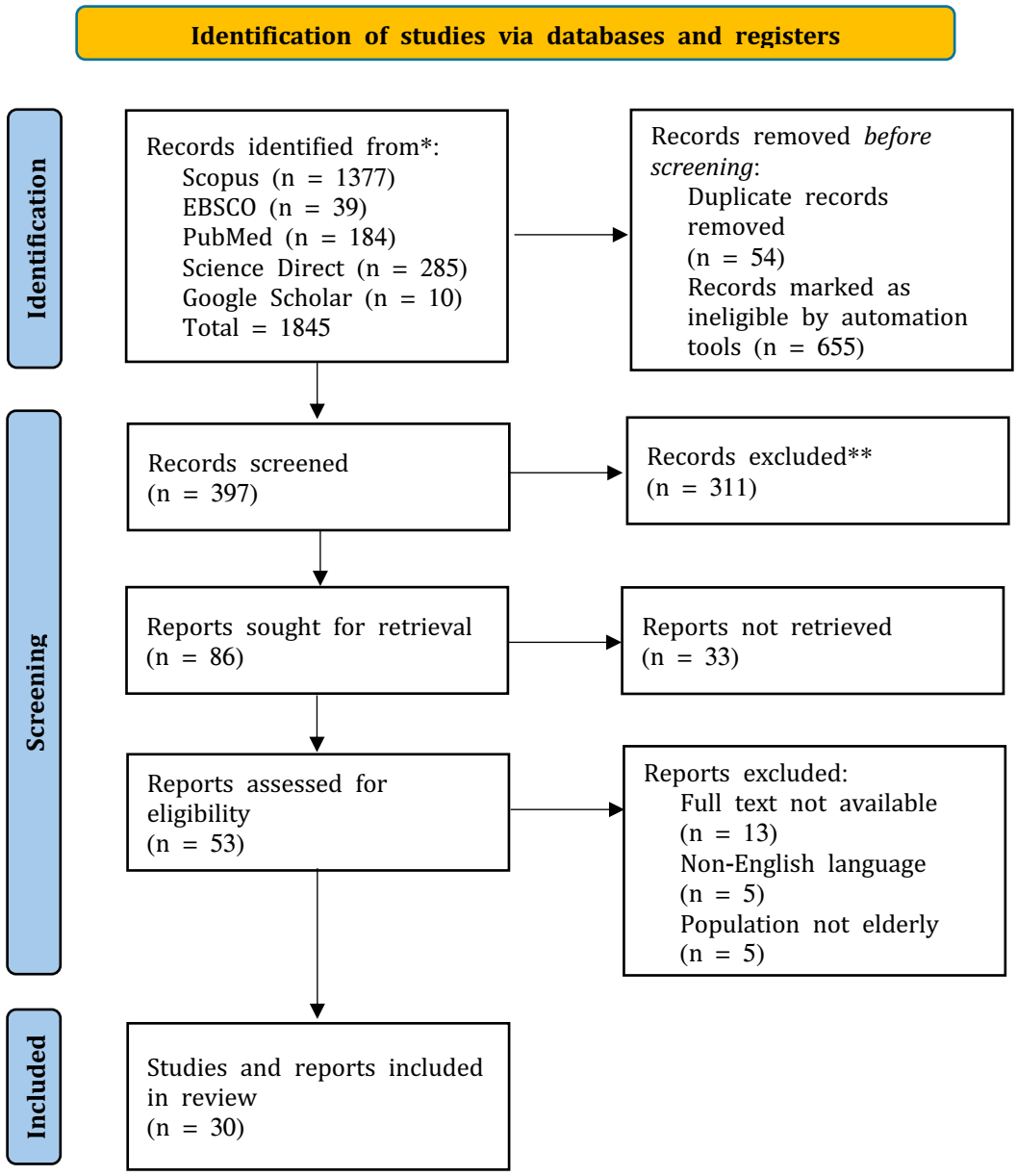
METHODS

This study utilized a scoping review design to map existing evidence and define stakeholder roles, serving as the critical analytical step to refine a framework for the safe self-consumption of HDS among the elderly. A scoping review was selected to synthesize the broad, multi-level factors influencing HDS safety and to provide the empirical basis required to operationalize the framework for practical clinical application. The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines.

A systematic search was conducted across five major databases, including Scopus, EBSCO, PubMed, Science Direct, and Google Scholar, focusing on literature published between 2015 and 2026. Keywords used in the search were derived from Medical Subject Headings (MeSH) and included terms such as "herbal supplements", "dietary supplements", "elderly OR older adults", "self-consumption", and "safety". In addition to academic journals, grey literature from the Ministry of Health (MOH) Malaysia and the National Pharmaceutical Regulatory Agency (NPRA) was reviewed to provide a regulatory context and ensure the findings applied to the Malaysian healthcare landscape.

The review included studies involving adults aged 60 and above that addressed HDS use, safety outcomes, or stakeholder involvement, specifically focusing on articles published in English. Exclusion criteria consisted of studies focusing on paediatric populations, animal-based research, and papers from unverified or predatory sources. Following the initial screening of 1,845 records, 30 relevant articles were selected for final synthesis (**Figure** 1).

Figure 1: PRISMA Flow Diagram



RESULT

The characteristics of sources included in the review are shown in **Table 1.** Data extraction focused on identifying stakeholder responsibilities, direct and indirect clinical risks, and systemic failures in documentation and communication to inform the development of the proposed safety framework (**Table 2**).

The review found a high prevalence of HDS use among older adults, ranging from 66.2% to 95.3%. High use was particularly evident among older adults with chronic conditions, including fibromyalgia, cancer, gastrointestinal disorders, and kidney disease (3–6,8,9,12).

Table 1: Characteristics of Sources Included in the Review

Author and year	Country	Framework stakeholder	Key findings	Relevance to stakeholder role
Askari et al. 2021 (4)	Iran	Healthcare Provider/ Interpersonal	Clinical trial on curcumin – piperine supplementation and clinical/inflammatory outcomes.	Demonstrates need for supervised supplementation and biochemical monitoring in medically complex patients.
Ikuta et al. 2019 (14)	Japan	Individual/ Interpersonal	76% of consumers do not consult professionals about interactions; many rely on "self-judgment" bias and intuition rather than clinical advice.	Supports professional counselling and consumer education about interactions.
Orlandoni et al. 2021 (23)	Italy	Healthcare Provider/ Individual	Probiotic strains (L. rhamnosus GG, B. animalis BB-12) are safe for frail elderly on feeding tubes, but require specialized, clinical-grade oversight.	Highlights clinical supervision of supplementation in frail older populations.
Risvoll et al. 2017 (24)	Norway	Individual/ Interpersonal	Identifies "indirect risk": 24% of cognitively impaired patients self-administer supplements, increasing the risk of medication errors and harmful interactions.	Supports medication reconciliation and caregiver involvement.
Washington et al. 2024 (32)	USA	Individual/ Healthcare Provider	Case report shows chronic turmeric use was associated with oxalate nephropathy.	Highlights the need for regulatory intervention to establish safe upper limits for herbal products.
Wolf et al. 2022 (33)	Germany	Healthcare Provider/ Systemic	92.2% of oncology outpatients are at risk of drug interactions; 26.1% specifically face CAM-drug interactions, often due to unmonitored self-consumption.	Supports systematic review of medication, food, herbs and supplements in oncology.
Hamachi et al. 2025 (13)	USA (Hawaii)	Individual/ Interpersonal	57.1% used CAM; only about one-third of CAM users had discussed CAM with a clinician.	Demonstrates a communication gap and importance of routine CAM enquiry.
San et al. 2022 (27)	Myanmar	Individual/ Interpersonal	71% prevalence of DS use in Myanmar elderly; 44.5% do not disclose use as they prioritize recommendations from social networks over medical advice.	Highlights high supplement use and need for reliable professional advice.
Asama et al. 2021 (3)	Japan	Individual/ Healthcare Provider	Propolis supplementation improved some cognitive measures; no adverse effects were observed during the trial.	Provides controlled safety information regarding supplementation in older adults.
Jaqua et al. 2024 (10)	USA	Individual/ Healthcare Provider	Among older adults using CAM and/or OTC medications, 15.6% had potential drug interactions.	Highlight the need for healthcare providers to routinely screen for CAM and use standardized assessment to improve medication safety.
Bleumer et al. 2025 (6)	Germany	Individual/ Healthcare Provider	CAM use was 88.3%, with dietary supplements among the most frequently used approaches. Only 36.6% received information from physicians about potential drug interactions and routine screening of CAM use.	Supports routine discussion of CAM and potential interactions during cancer care.
Levy Yurkovski et al. 2026 (17)	Israel	Provider/ Systemic	Integrative safety consultation identified substantial potential	Supports structured supplement consultation

			DHS-related interactions and poor documentation of supplement use.	and documentation in medical records.
Babelghaith et al. 2024 (5)	Saudi Arabia	Individual/ Interpersonal	63% prevalence of CAM use for GI issues; 82% do not disclose use to doctors, relying instead on family/friends for advice.	Supports credible consumer information and professional counselling.
Yusof et al. 2023 (34)	Indonesia	Individual/ Systemic	High DS use (71.1%) was driven by COVID-19 anxiety; links psychological distress to increased risk of unmonitored self-consumption.	Demonstrates how psychological and contextual factors may influence supplement consumption.
Vanoh et al. 2021 (30)	Malaysia	Individual/ Provider	A 3-year study shows that high DS intake among the elderly did not improve cognitive or physical function, challenging the "perceived benefit".	Helps distinguish perceived supplement benefits from measured health outcomes.
Wahab et al. 2021 (31)	Malaysia	Interpersonal/ Systemic	54.5% of Malaysian elderly use HDS; nearly half do not disclose use because the doctor did not ask or they felt it was unnecessary.	Demonstrates the importance of HDS enquiry and communication among Malaysian older adults.
Flood et al. 2025 (11)	Ireland	Interpersonal/ Provider	95.3% CAM use in Sjögren's syndrome; advocates for "collaborative inquiry" to align patient satisfaction with clinical safety.	Supports collaborative discussion of CAM within chronic disease management.
Li et al. 2026 (19)	China	Healthcare Provider/ Interpersonal	Shared decision-making (SDM) in TCM significantly improves treatment usefulness and quality of life, moving away from paternalistic medical models	Supports collaborative rather than paternalistic decision-making.
Mohabbat et al. 2019 (20)	USA	Individual/ Healthcare Provider	98.1% of fibromyalgia patients utilize CIM in 14-year follow-up survey	Demonstrates persistent long-term complementary therapy use and importance of ongoing clinical discussion.
Risvoll et al. 2025 (25)	Norway	Interpersonal/ Healthcare Provider	Dementia patients face high overdose risks due to forgetfulness; caregivers often lack awareness of DS harms.	Supports caregiver education and professional medication/supplement review.
Jakimowicz-Tylicka 2018 (16)	Poland	Individual/ Healthcare Provider	75% of CKD patients are unaware of DS-related renal toxicity; only 14% of doctors proactively initiated supplement discussions.	Supports disease-specific DS screening protocol and education in patients vulnerable to renal toxicity.
Arlauskas et al. 2024 (2)	Lithuania	Individual/ Systemic	Confirms that 72% of renal patients do not consult specialists. Post-pandemic trends show DS use remains high (69%); individuals prioritizing "health strength" are at higher risk for long-term overconsumption.	Demonstrates population-level drivers of supplement use.
Vega et al. 2017 (30)	USA	Individual/ Systemic	HDS accounts for significant liver injury (HDSILI); highlights the "natural" misconception as a primary driver for severe clinical manifestations.	Supports adverse-event recognition and pharmacovigilance for HDS.
Okon et al. 2025 (22)	Germany	Healthcare Provider/ Systemic	38.8% of GPs rarely address DS during health exams; identifies time constraints and lack of evidence-based resources as primary systemic barriers.	Supports standardised DS enquiry, documentation and evidence resources for clinicians.
Al-Hadi & Mikhael 2024 (1)	Iraq	Healthcare Provider/ Systemic	Pharmacists expressed concerns about DS efficacy, safety and market quality; patient counselling about adverse effects/interactions was limited in a qualitative study.	Supports strengthening pharmacists' counselling and safety-gatekeeper roles.
Chung et al. 2021 (9)	WHO Western Pacific Region	Systemic/ Policy	T&CM in the Western Pacific is rooted in cultural identity; safety frameworks must harmonize traditional wisdom with modern clinical surveillance.	Supports regulatory governance and culturally appropriate integration of T&CM.
Fravel et al. 2023 (12)	Australia & USA	Individual/ Systemic	66.2% used ≥1 supplement/CAM; vitamin D, fish oil and calcium were common. Female sex, US	High prevalence supports routine assessment of

			residence, higher education and polypharmacy were associated with use.	supplement use in older patients.
Choi et al. 2017 (8)	South Korea	Individual/ Healthcare Provider	72.4% "parallel use" of CM and CAM; only 18.2% disclosure rate highlights a deep "communication void" in clinical settings.	Supports proactive enquiry and communication regarding concurrent CAM use.
Changaramkumarath 2025 (7)	International	Individual/ Healthcare Provider	Identified clinically relevant interactions between nutritional supplements and prescription medicines, including risks involving antithrombotic therapy.	Supports medication reconciliation, pharmacist involvement and interaction screening.
Ministry of Health Malaysia 2021 (35)	Malaysia	Systemic/ Policy	Establishes national direction for T&CM regulation, safe practice, rational use, quality, research and integration within healthcare.	Defines government responsibility for governance, regulation, quality and safe integration of T&CM.

Table 2: Comparison of the Preliminary and Refined Framework Components

Framework Component	Original Conception	Refinement from this Review
Elderly	Individual users of HDS	Added: knowledge-vulnerability gap, self-directed decision-making risk
Family/Community	General influencer role	Split into "reliable advice" vs. "unsafe parallel use" pathways
Healthcare Provider	Passive recipients of disclosure	Reframed as active screeners/gatekeepers
MOH/NPRA	Policy-setting body	Expanded to include mandatory documentation enforcement

The Elderly: **Health Status and Knowledge Gaps**

At the core of the framework, elderly individuals utilize HDS, as part of broader T&CM or CAM practices to maintain physical function, enhance immunity, or manage chronic symptoms as part of healthy aging (1,2). However, a significant knowledge-vulnerability gap exists; patients are often unaware of the potential for toxicity associated with their comorbidities and possess limited knowledge regarding product selection and safety (12,18). Despite age-related physiological decline and polypharmacy, many engage in self-directed decision-making, which increases the risk of severe clinical hazards such as oxalate nephropathy and HDS-induced liver injury (13–15).

Family and Community: **Reliable Advice and Feedback**

The findings emphasize that family members and social networks are primary influencers and sources of recommendation for HDS use (1,7–9). For specific vulnerable groups, such as dementia patients, caregivers are central to supplement administration but often lack awareness of the associated risks (30). The framework captures this through the "Reliable Advice" pathway; while informal or culturally driven advice can perpetuate non-disclosure and unsafe parallel use, guidance based on credible information can positively shape safe decision-making (10). Furthermore, this level serves as a source of "Public Feedback", where family input helps shape responsive and culturally relevant regulations (25–28).

Healthcare Providers: **Responsibility and Clinical Competency**

A major finding is the systemic transparency gap, with HDS non-disclosure rates ranging from 44.5% to 82% (1,9,10). This communication failure is reciprocal; clinicians often fail to proactively screen for HDS use due to time constraints and lack of reliable evidence-based resources (11). This lack of documentation leaves patients vulnerable to significant drug-supplement interactions such as calcium interfering with levothyroxine or increased bleeding risks with antithrombotics (4,15,22).

Even therapeutic applications, such as probiotic administration for frail patients, require specialized clinical-grade oversight to avoid suboptimal outcomes (16,17). To address this, the framework emphasizes "Responsibility" and "HDS Competency", noting that pharmacist confidence gaps must be bridged (21). Measurable improvements were found in structured models, where integrative safety consultations and shared decision-making reduced unsafe use by 50% and improved quality of life (19,20).

Governance: Ministry of Health (MOH)/National Pharmaceutical Regulatory Agency (NPRA) and Collaborative Governance

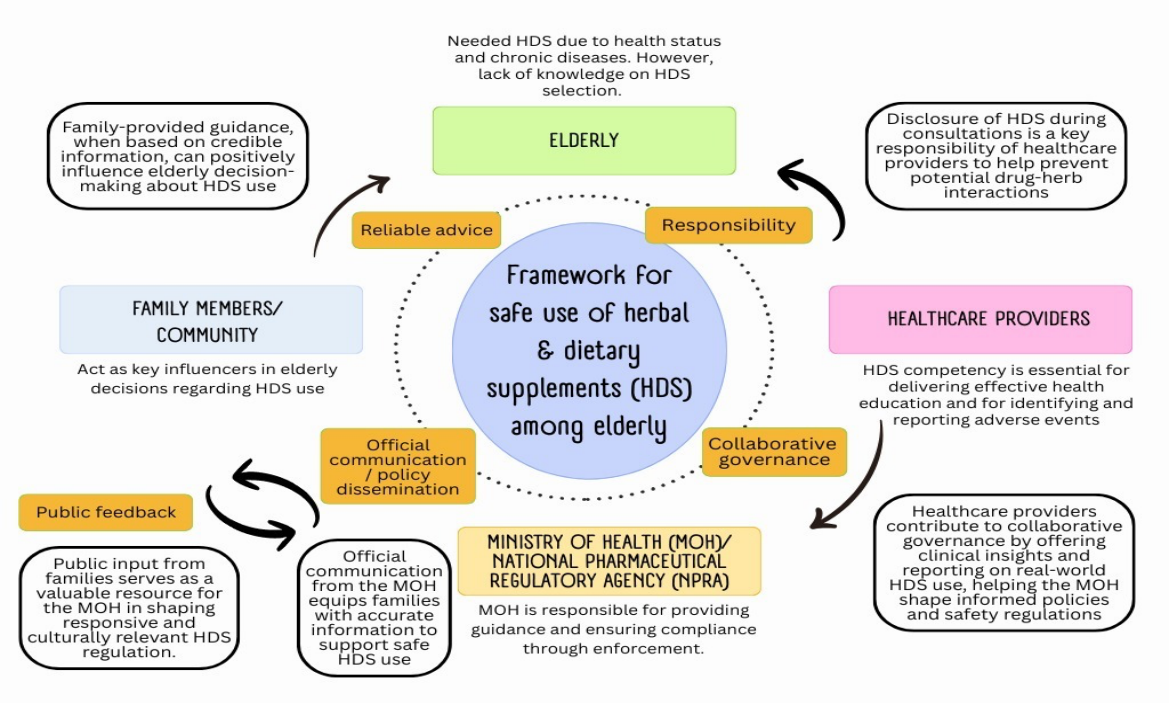
The review identifies a disconnect between widespread public HDS use and current regulatory infrastructure, characterized by under-reporting of adverse events and a lack of standardized documentation (13,21,22). The proposed framework positions the Ministry of Health (MOH) and the National Pharmaceutical Regulatory Agency (NPRA) as the authorities responsible for "Official Communication" and "Policy Dissemination". This is supported by the Malaysian National Policy on Traditional and Complementary Medicine (T&CM), which recognizes HDS safety as a public health priority requiring multi-level governance and practitioner regulation (9,21). Ultimately, safety is achieved through "Collaborative Governance", where providers offer clinical insights to help the MOH shape informed safety regulations (25–28).

This review works from the assumption that findings from healthcare systems around the world can still be useful in shaping a better framework for HDS use among the older adults in Malaysia, even though the local context is different. This makes sense because many of the challenges older adults face when it comes to supplements are not unique to one country. Problems like reduced drug metabolism with age, polypharmacy from managing multiple chronic conditions, and strong reliance on community or family health beliefs tend to show up across different populations, not just in Malaysia. Studies from other countries consistently show that elderly patients often take supplements on their own initiative and frequently do not tell their doctors about it, and this pattern of non-disclosure appears to be a common issue rather than something specific to any single healthcare system (30). That said, findings from other countries cannot simply be applied to Malaysia without some adjustment. Malaysia has its own regulatory structure through the NPRA, and T&CM is much more culturally embedded here than in many Western settings, which affects how people view and use supplements. So, while the global evidence gives a useful starting point, it needs to be interpreted through the lens of Malaysia's own regulatory and cultural landscape. Taking both perspectives into account allows this review to build a framework that reflects international safety evidence while still being realistic and applicable to the Malaysian healthcare setting.

Framework Refinement Process

Prior to this review, the research team had conceptualised a preliminary framework comprising four key stakeholder groups: older adults, family and community members, healthcare providers, and regulatory bodies (**Table 2**). The preliminary framework was informed by the team's clinical and professional experience but had not yet been systematically supported by evidence from the literature. Therefore, this scoping review was undertaken to identify and synthesise relevant evidence to refine the framework and further define the roles of each stakeholder group. This improvement happened in three main ways. Each stakeholder group was supported with real numbers, such as non-disclosure rates and prevalence figures. The relationships between the different groups were also made clearer, for example by showing the difference between family advice that is based on good information and advice that is just passed around without any clinical basis. Lastly, the responsibilities of each group were reconsidered based on what the evidence showed was lacking, especially by shifting healthcare providers from just receiving information to actively screening for it and shifting regulatory bodies from only setting policies to also making sure documentation rules are followed. The final framework is shown in **Figure 2**.

Figure 2: Refined Framework



DISCUSSION

This scoping review identified a consistently high prevalence of HDS use among older adults with chronic diseases across multiple countries. The findings demonstrate that HDS consumption is not an isolated behaviour but a complex, multi-level system influenced by individual vulnerability, interpersonal dynamics, healthcare provider engagement, and systemic governance structures. Based on these findings, a multi-layered framework for safe HDS use among the elderly is proposed. The preliminary framework was conceptualised by the research team prior to this review, comprising key stakeholder groups identified through clinical and professional experience. The current scoping review provides an evidence-based foundation for refining the framework by systematically synthesising current evidence, clarifying stakeholder roles, and identifying practical strategies for its application in clinical practice. The framework in Figure 2 integrates these findings into four interconnected layers, providing a roadmap for stakeholders to transition from fragmented supplement use to a collaborative, safety-oriented environment.

Individual Level: Elderly as Active but Vulnerable Consumers

The review shows that HDS use among older adults range from moderate to extremely high prevalence, particularly among those with chronic illnesses (3,5,8). Many older adults consume HDS to maintain health, manage chronic symptoms, or enhance immunity (1,2). However, studies also revealed limited knowledge regarding product selection, safety, and potential interactions (12,18). Furthermore, because supplement use is frequently driven by social networks rather than clinical guidance, the patient's health decision-making process is often detached from their actual clinical needs, as patients may prioritize perceived wellness benefits over evidence-based safety profiles (31).

This supports the first component of the framework: elderly individuals require reliable advice due to health status and chronic disease burden. The findings demonstrate that elderly users often make self-directed decisions despite polypharmacy and age-related physiological decline, increasing risks of nephrotoxicity and hepatotoxicity (13,14). Therefore, individual-level education alone is insufficient without structured support.

Interpersonal Level: Family and Community as Decision Influencers

The findings highlight the significant influence of family members and social networks on HDS decision-making. In several studies, family and friends were primary sources of recommendation (1,8,9). Among dementia

patients, caregivers played a critical role in supplement administration, yet many lacked awareness of associated risks (29). This reality is supported by broader healthcare research, which identifies family caregivers as the essential gatekeepers of the elderly home-care environment; without structured, accessible safety information, these caregivers often rely on anecdotal community advice that may overlook complex herb-drug interactions (33). This aligns directly with the framework component positioning family members and community as key influencers. When guidance is based on credible information, it may positively shape safe decision-making. However, when advice is informal or culturally driven without clinical oversight, it may lead to unsafe parallel use (10).

The framework therefore emphasises "reliable advice" flowing toward the elderly and "public feedback" returning to policymakers. This relationship reflects the need to strengthen health literacy not only among older adults but also within caregiving networks.

Healthcare Provider Level: **Responsibility and Clinical Competency**

A major finding across studies was the communication gap between patients and healthcare providers. Non-disclosure rates ranged from 44% to 82% (1,9), and many physicians rarely initiated discussions on HDS use (11). Additionally, discrepancies between self-reported use and electronic health record documentation were evident (22). These findings strongly justify the framework's emphasis on healthcare provider responsibility in screening for HDS use during consultations. Drug-supplement interactions were common, particularly among oncology patients and polypharmacy populations (4,15). Without proactive disclosure and documentation, preventable adverse events may occur. Furthermore, pharmacist and other healthcare providers confidence gaps and concerns regarding product regulation (21) indicate the need for strengthened professional competency. Structured models such as integrative safety consultation services demonstrated measurable improvements, reducing unsafe supplement use by 50% (19). Similarly, shared decision-making models improved treatment satisfaction and quality of life (20). Thus, the framework proposes healthcare providers as active safety gatekeepers responsible for the identification of interactions, patient education, and reporting adverse events.

Systemic Level: **Collaborative Governance and Regulatory Oversight**

The review identified systemic deficiencies, including under-reporting of supplement-related liver injury, lack of standardized documentation, and insufficient regulatory confidence among pharmacists (13,21,22).

The proposed framework situates the MOH and NPRA at the governance level to ensure enforcement, regulation, and dissemination of official communication. The Malaysian National Policy of Traditional and Complementary Medicine support structured integration, practitioner regulation, and quality control mechanisms.

The findings demonstrate that safety cannot rely solely on individual behaviour change. Instead, it requires collaborative governance where healthcare providers contribute real-world clinical insights, and public feedback informs culturally responsive policy adjustments. As highlighted in international policy reviews, the successful integration of herbal and traditional medicine into national health systems depends on moving beyond fragmented oversight toward a holistic governance model that bridges the gap between regulatory standards and the reality of clinical practice (9).

Integration of Multi-Level Interactions

The findings collectively reinforce that HDS safety among older adults operates within interconnected layers rather than isolated domains. High prevalence, non-disclosure, polypharmacy, organ-specific toxicity, and regulatory gaps converge to create cumulative risk.

The proposed framework integrates these levels through two central pillars: reliable advice and responsibility. Reliable advice must originate from credible sources such as family informed by policy and providers trained in HDS competency, while responsibility must be shared between elderly individuals, healthcare providers, and regulatory authorities.

By situating the elderly at the centre and embedding them within interpersonal, provider, and policy systems, the framework

addresses the multidimensional safety challenges identified in this review.

Alternative Interpretations: **Autonomy and Cultural Agency**

While this review strongly emphasizes clinical risks, non-disclosure, and regulatory gaps, alternative interpretations of HDS self-consumption should also be considered. Rather than viewing supplement use solely as a hazardous clinical liability, self-directed consumption can alternatively be read as an expression of patient autonomy, personal agency, and a culturally embedded pursuit of holistic well-being. This interpretation is not purely speculative; (33) noted that elderly users often prioritize perceived wellness benefits over evidence-based safety profiles, and several included studies suggest that non-disclosure is not always driven by fear or secrecy but sometimes by a genuine belief that supplement use falls outside what a doctor needs to know (31). For many older adults, traditional practices and dietary supplements offer a sense of control over their health, emotional comfort, and psychological resilience in managing chronic aging processes, particularly when conventional medical options feel restrictive or impersonal. Framed this way, safety frameworks should not adopt a purely paternalistic approach that seeks to eliminate self-consumption altogether. Instead, they must balance clinical risk mitigation with respect for patient autonomy, fostering a collaborative environment in which traditional health choices are understood, respected, and safely integrated into routine care rather than simply discouraged.

CONCLUSION

This scoping review synthesised evidence from 30 studies to examine the patterns, safety concerns, and stakeholder roles associated with the self-consumption of HDS among older adults. The findings demonstrate that HDS use is highly prevalent across both community and clinical populations, often driven by the perception that natural products are inherently safe and supported by recommendations from family members or social networks. However, widespread non-disclosure to healthcare professionals, limited documentation in medical records, and the frequent coexistence of polypharmacy significantly increase the risk of adverse herb–drug interactions and organ-related toxicity.

The review also identified vulnerable populations, including elderly individuals with chronic diseases, dementia, and cancer, who may face greater risks due to physiological decline, complex medication regimens, and limited knowledge of supplement safety. Although some studies reported potential health benefits when supplements were used under controlled conditions, the overall evidence indicates that unsupervised consumption may expose elderly users to preventable clinical risks.

Importantly, the findings highlight that ensuring safe HDS use cannot rely solely on individual decision-making. Instead, it requires a coordinated, multi-level approach involving elderly individuals, caregivers, healthcare providers, and regulatory authorities. The proposed framework emphasises the role of elderly individuals as active but vulnerable consumers, the influence of family and community networks in shaping supplement decisions, the responsibility of healthcare providers to actively screen and document supplement use, and the critical role of regulatory bodies in strengthening policy integration and safety monitoring. By integrating these stakeholder roles, the framework provides a structured approach to improving communication, documentation, and clinical oversight of HDS use among elderly populations. Ultimately, promoting safe supplement practices requires shared responsibility, strengthened health literacy, and greater collaboration between healthcare professionals and policymakers to harmonise traditional health practices with modern clinical safety standards.

LIMITATIONS AND RECOMMENDATIONS

Several limitations need to be acknowledged in this review. The 30 studies included were quite varied in design and scope, ranging from clinical trials to case reports and cross-sectional surveys, which made it difficult to compare results directly or draw conclusions that apply uniformly across settings. Given how different these healthcare systems and regulatory environments are from Malaysia's, and how differently T&CM is culturally embedded here, parts of the proposed framework are necessarily built on evidence that may not translate cleanly to the local setting.

The review was also limited to English-language publications. As shown in the

PRISMA flow diagram (**Figure** 1), five reports that were otherwise eligible had to be excluded at the eligibility stage simply because they were not in English, which may have left out relevant work, including Malay-language literature that could have offered more locally grounded insight. A related issue is that of the 86 reports sought for retrieval, 33 could not be obtained, so some potentially relevant evidence was lost before it could even be assessed. There is also the ordinary risk of publication bias in any review built on published literature; studies showing significant harms or successful interventions tend to get published more readily than those with null results, which could skew the overall picture toward more alarming or more favourable findings than actually exist.

Finally, while the search covered five databases (Scopus, EBSCO, PubMed, Science Direct, and Google Scholar) along with grey literature from the Ministry of Health and the National Pharmaceutical Regulatory Agency, it is still possible that some unpublished reports or institutional data relevant to the Malaysian context were missed. These gaps do not undermine the framework, but they do mean it should be read as a starting point rather than a finished product, one that would benefit from further locally conducted research on elderly HDS use in Malaysia to test and refine it.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHOR CONTRIBUTIONS

AAR: Conceptualization, literature search, screening, data extraction, data synthesis, writing original draft, review and editing.

NAM: Conceptualization, methodology, supervision, validation, interpretation of findings, framework refinement, review and editing.

NKK: Literature screening, data extraction, validation, interpretation of findings, review and editing.

AUB: Validation, interpretation of findings, framework refinement, review and editing.

DECLARATION OF GENERATIVE AI USE

Generative artificial intelligence (AI) tools were used to assist with language editing, grammar correction, improving the clarity and readability of the manuscript, and supporting the organisation and refinement of the proposed framework. The framework was critically reviewed, interpreted, and finalised by the authors based on the findings of the scoping review. The authors take full responsibility for the accuracy, integrity, and final content of the manuscript.

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