Future Natural Products
doi:10.34172/fnp.362 2025;11(1):50-52 https://fnp.skums.ac.ir

Policy Brief

Bridging Regulatory Gaps for Evidence-Based Natural Products: Advancing the Translation of Scientific Evidence Towards Health Policy

Zahra Lorigooini[1*]

[1]Medical Plants Research Center, Basic Health Sciences Institute, Shahrekord University of Medical Sciences, Shahrekord, Iran

***Corresponding Author:**
Zahra Lorigooini,
Emails: lorigooini.z@skums.ac.ir, z.lorigooini@gmail.com

Received: May 23, 2026
Revised: June 15, 2026
Accepted: July 19, 2026
ePublished: August 25, 2026

Abstract

Problem: Despite a growing body of preclinical and clinical evidence supporting neuroprotective, anti-inflammatory, antimicrobial, and metabolic effects of selected natural products, the translation of this evidence into evidence-based healthcare systems remains hindered by inconsistent regulatory classifications and fragmented policy frameworks.

Results: Recent advances in metabolomics, systems pharmacology, standardized extraction methodologies, controlled cultivation practices, randomized controlled trials, and contemporary quality-assurance protocols have considerably improved the reproducibility, safety profiling, and mechanistic elucidation of natural products. However, substantial gaps remain in regulatory harmonization, integration into clinical practice guidelines, translational research funding, professional education, and the balanced evaluation of adverse effects and drug–natural product interactions.

Recommended Action: Health authorities and policymakers are advised to adopt adaptive regulatory frameworks, increase dedicated funding for translational research, incorporate rigorously validated natural products into clinical practice guidelines, and strengthen evidence-based curricula in the training of healthcare professionals and regulatory personnel.

Urgency: Scientifically validated natural products will remain underutilized without coordinated policy reform, thereby constraining global access to potentially cost-effective therapeutic options and impeding innovation across healthcare systems.

Target Audience: This brief is directed at health policymakers, regulatory agencies, healthcare administrators, clinical guideline developers, public health organizations, translational researchers, and scientific journal editors.

Scope Clarification: This document focuses exclusively on substances for which there is robust clinical trial evidence, rather than endorsing unproven natural products.

Keywords: Natural Products, Medicinal Plants, Health Policy, Translational Medicine, Regulatory Harmonization, Evidence-Based Medicine, Clinical Integration

Cite this article as: Lorigooini Z. Bridging regulatory gaps for evidence-based natural products: advancing the translation of scientific evidence towards health policy. Future Nat Prod 2025;11(1):50-52. doi:10.34172/fnp.362

Introduction

Natural products and medicinal plants have historically been the cornerstone of drug discovery and therapeutic innovation. In recent decades, transformative progress in analytical chemistry, metabolomics, systems pharmacology, biotechnology, and clinical trial design has substantially strengthened the scientific underpinnings of natural product research (1-3). A growing body of research continues to investigate the therapeutic potential and molecular mechanisms of plant-derived and naturally sourced compounds (2, 4).

Nevertheless, this scientific momentum has outpaced the development of corresponding policy and regulatory frameworks. Depending on the jurisdiction in question, natural products are subject to divergent classifications, ranging from medicinal products to dietary supplements and functional foods. This regulatory heterogeneity gives rise to inconsistent standards for quality control, safety evaluation, therapeutic claims, and clinical implementation (5, 6). Moreover, such fragmentation poses formidable obstacles to the translation of clinical evidence on natural products into mainstream healthcare systems.

Thus, bridging the gap between scientific discovery and policy implementation has become an urgent global health priority. Accordingly, this brief exclusively addresses substances supported by rigorous clinical trial evidence, instead of advocating for unproven natural products.

Key Challenges for Policymakers

Regulatory Inconsistency

Heterogeneous global regulations produce conflicting standards for safety, efficacy, manufacturing quality, and permissible therapeutic claims.

© 2025 The Author(s); Published by Shahrekord University of Medical Sciences. This is an open-access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Limited Clinical Integration

Despite a growing evidence base, many validated natural products remain largely absent from clinical practice guidelines and routine healthcare protocols.

Insufficient Translational Funding

In general, a lack of dedicated funding mechanisms for bench-to-bedside research impedes the transition from experimental validation to clinical application.

Educational Disparities

Systemic deficiencies in standardized, evidence-based training leave healthcare professionals and policymakers inadequately prepared to address the clinical use and regulation of natural products.

Safety and Interaction Risks

Even evidence-supported natural products may cause adverse effects or clinically relevant drug interactions, particularly when used concomitantly with medicines with a narrow therapeutic index or known interaction potential (7).

Public Health Impact

The delayed integration of validated natural products into mainstream healthcare systems poses several significant risks to public health, which are presented as follows:

Restricted Access to Care: It limits patient access to potentially cost-effective, evidence-based, and affordable therapeutic alternatives.

Compromised Product Integrity: In general, inconsistent regulatory oversight can contribute to substantial variability in product quality, safety, and therapeutic reliability across global markets.

Proliferation of Misinformation: The absence of standardized, evidence-based guidance fosters clinical uncertainty and contributes to the spread of misinformation among both healthcare professionals and the general public, ultimately undermining sound clinical decision-making and gradually eroding patient trust.

Patient Safety Concerns: Weak pharmacovigilance and unclear labeling increase the risk of inappropriate self-medication, adverse effects, and potentially harmful interactions with conventional therapies.

Evidence and Translational Advancement

Recent scientific breakthroughs have substantially enhanced the reliability and translational potential of natural product research. Key advancements are listed as follows:

Methodological Rigor: Implementation of standardized cultivation, precision extraction protocols, and intelligent postharvest metabolite enrichment strategies.

Analytical Depth: Application of advanced metabolomic profiling, systems pharmacology, detailed mechanistic investigations of molecular targets, and validated quality-control parameters (8).

Clinical Validation: Rigorous clinical evaluation, including well-designed randomized controlled trials where appropriate and systematic assessment of the available evidence, should be prioritized to establish the safety and efficacy of natural products intended for clinical use.

Natural compounds exhibit diverse pharmacological activities, although the strength of clinical evidence varies by product and indication (2, 3). Recent global policy developments concurrently emphasize the need to strengthen evidence generation, ensure safety and regulatory oversight, and integrate traditional, complementary, and natural product-based interventions into health systems when supported by robust evidence (8). Together, these developments support the appropriate integration of validated natural products into evidence-based healthcare when supported by robust clinical evidence.

Policy Recommendations

A variety of strategic actions are recommended to address these systemic challenges:

Achieving Regulatory Harmonization

The development of adaptive and internationally aligned regulatory frameworks is essential to ensure the consistent evaluation of natural products. National regulatory authorities should collaborate with international health organizations in order to establish standardized criteria for safety, efficacy, and quality control. Such harmonization will enhance transparency, promote global market consistency, and strengthen public trust in natural product-based interventions. This approach is consistent with current global efforts to strengthen evidence generation, safety surveillance, regulation, and health-system integration in traditional and complementary medicine (9).

Strengthening Translational Funding

To bridge the "valley of death" between laboratory findings and clinical application, increased investment in translational and implementation research is imperative. Hence, policymakers should prioritize dedicated funding programs and foster multidisciplinary collaborations among academia, healthcare systems, and the pharmaceutical industry to accelerate clinical validation. Moreover, funding should be sourced from national health budgets and international organizations (e.g., the World Health Organization). Additional support may be coordinated through competitive public grants, philanthropic foundations, and carefully governed public-private partnerships with robust conflict-of-interest safeguards.

Integration Into Clinical Guidelines

High-quality evidence regarding validated natural products should be systematically evaluated for incorporation into clinical practice guidelines using standardized evidence-grading systems.

Capacity Building and Education

To enhance scientific literacy, structured educational programs must be developed for healthcare professionals

and policymakers. The implementation of evidence-based training materials and continuous professional development initiatives will mitigate misinformation and facilitate informed, evidence-based decision-making.

The Role of Scientific Journals

Scientific journals serve as critical conduits between research and policy. These journals can catalyze systemic changes by promoting policy-oriented scientific discourse, encouraging authors to address the translational implications of their work, and facilitating interdisciplinary communication. Furthermore, the establishment of dedicated sections focused on policy translation and implementation science would significantly strengthen the nexus between scientific evidence and actionable health policy.

Conclusion

The evidence base for selected natural products has expanded substantially. Nevertheless, a critical misalignment persists: while the science has matured, regulatory and policy frameworks continue to lag, thereby creating a systemic bottleneck. Likewise, the confluence of regulatory fragmentation, inadequate translational funding, delayed clinical guideline integration, unresolved safety and interaction concerns, and educational disparities collectively obstructs the seamless incorporation of validated natural products into mainstream healthcare.

Coordinated policy action is therefore needed to address these regulatory and translational gaps. To bridge the gap between scientific discovery and healthcare implementation, global health authorities must prioritize the establishment of harmonized regulatory standards, substantial investment in translational research, systematic safety surveillance, and the structured integration of evidence into clinical practice.

Advances in natural product science warrant greater policy engagement, international collaboration, and evidence-based consideration within healthcare systems.

Acknowledgments

The author gratefully acknowledges the Deputy of Research and Technology at Shahrekord University of Medical Sciences for providing administrative support.

Competing Interests

The author serves as the Editor-in-Chief of the journal. The author had no involvement in the peer-review process or editorial decision regarding this manuscript. The manuscript was handled independently by another editor in accordance with the journal's standard editorial procedures.

Ethical Approval

Not applicable.

Funding

This study received no financial support.

References

1. Koehn FE, Carter GT. The evolving role of natural products in drug discovery. Nat Rev Drug Discov 2005;4(3):206-20. doi:10.1038/nrd1657
2. Newman DJ, Cragg GM. Natural products as sources of new drugs over the nearly four decades from 01/1981 to 09/2019. J Nat Prod 2020;83(3):770-803. doi:10.1021/acs.jnatprod.9b01285
3. Atanasov AG, Waltenberger B, Pferschy-Wenzig EM, Linder T, Wawrosch C, Uhrin P, et al. Discovery and resupply of pharmacologically active plant-derived natural products: a review. Biotechnol Adv 2015;33(8):1582-614. doi:10.1016/j.biotechadv.2015.08.001
4. Li JW, Vederas JC. Drug discovery and natural products: end of an era or an endless frontier? Science 2009;325(5937):161-5. doi:10.1126/science.1168243
5. World Health Organization (WHO). WHO Traditional Medicine Strategy: 2014-2023. Geneva: WHO; 2013.
6. Steinhoff B. Challenges in the quality of herbal medicinal products with a specific focus on contaminants. Phytochem Anal 2021;32(2):117-23. doi:10.1002/pca.2879
7. World Health Organization (WHO). Key technical issues of herbal medicines with reference to interaction with other medicines. Geneva: WHO; 2021.
8. Edo GI, Obasohan P, Makia RS, Abiola O T, Umelo EC, Jikah AN, et al. The use of quality control parameters in the evaluation of herbal drugs. A review. Discov Med 2024;1(1):168. doi:10.1007/s44337-024-00177-6
9. World Health Organization (WHO). Global Traditional Medicine Strategy 2025-2034. Geneva: WHO; 2025.