



Unveiling Users' Experiences with Herbal Medicine in Disease Management: Perspectives on Effectiveness and Mechanisms of Action of Natural Compounds

Kristianningrum Dian Sofiana

Universitas Jember, Indonesia

kds sofiana.fk@gmail.com

Article Info

Article history:

Received 21-01-2025

Revised 20-02-2025

Accepted 17-03-2025

Keyword:

Herbal Medicine, Patient Experience, Disease Management, Natural Compounds, Effectiveness, Mechanism of Action

ABSTRACT

Herbal medicine has been widely used as an alternative or complementary treatment for various diseases, yet its effectiveness and mechanisms of action remain underexplored. This study examines the lived experiences of herbal medicine users, focusing on their perceptions of effectiveness and understanding of natural compound mechanisms in disease management. Using a phenomenological approach, in-depth interviews and observations were conducted with individuals who have been using herbal medicine for at least six months. Thematic analysis revealed that participants reported positive health benefits, including symptom relief, increased energy levels, and improved digestion. However, challenges such as lack of standardized dosing and delayed therapeutic responses were also noted. Participants' perceptions of herbal medicine effectiveness were influenced by personal experiences, community recommendations, and holistic health practices. These findings contribute to a deeper understanding of patient perspectives on alternative medicine and provide insights for healthcare professionals, policymakers, and researchers on integrating herbal medicine into community healthcare systems.



©2025 Authors. Published by PT Mukhlisina Revolution Center.. This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License. (<https://creativecommons.org/licenses/by/4.0/>)

INTRODUCTION

Herbal medicine has been an integral part of healthcare practices across cultures for centuries, offering an alternative to conventional pharmaceutical treatments (Asgharian dkk., 2022). As public interest in natural and alternative therapies continues to grow, the use of herbal remedies has become increasingly prevalent in managing a wide range of health conditions, including chronic diseases like hypertension, diabetes, and digestive disorders (Ayati dkk., 2020). Despite this widespread use, there remains a significant gap in scientific understanding regarding the effectiveness, safety, and mechanisms of action of many herbal medicines, particularly in comparison to conventional pharmaceutical drugs. This gap in knowledge presents challenges for both healthcare providers and users, who often rely on personal experiences and anecdotal evidence to guide their choices.

The increasing popularity of herbal medicine has been supported by advances in technology, such as improved extraction and standardization techniques, as well as the growing body of research into the bioactive compounds found in various plants (Banerjee dkk., 2023). However, much of the existing research focuses on the pharmacological properties of specific compounds or the efficacy of particular herbs, leaving the subjective experiences of users largely unexplored. Understanding the lived experiences of those who use herbal remedies—how they perceive their effectiveness, safety, and impact on their well-being—is crucial for bridging this gap (Cui dkk., 2024). Users' personal beliefs, cultural contexts, and knowledge of herbal medicine play a significant role in shaping their decisions and outcomes. These subjective experiences offer rich insights into the broader context of herbal medicine usage and its potential integration with conventional healthcare practices.

Existing research has primarily employed quantitative methods, such as randomized controlled trials (RCTs) or laboratory studies, to evaluate the clinical effectiveness and safety of herbal products

(Farzaei dkk., 2016). While these approaches provide valuable data on pharmacokinetics and therapeutic outcomes, they do not capture the nuanced, lived experiences of individuals who use these remedies. This study aims to fill this gap by adopting a phenomenological approach, which focuses on understanding the deeper meaning behind the personal experiences of herbal medicine users. By exploring how individuals make sense of their use of herbal remedies and the meanings they attribute to their experiences, this research seeks to provide a more holistic understanding of herbal medicine beyond its clinical efficacy.

The goal of this study is to explore the subjective experiences of individuals who use herbal remedies in managing their health (Huang dkk., 2024). By delving into these personal narratives, the research aims to uncover the underlying factors that shape users' perceptions, beliefs, and behaviors regarding herbal medicine. Such an approach is essential for gaining a comprehensive understanding of the complex and multifaceted nature of herbal medicine use and its potential role in contemporary healthcare.

In recent years, research into the lived experiences of individuals using herbal medicine has emerged as a crucial area of inquiry within the broader field of alternative medicine (Jiang dkk., 2023). Understanding how users perceive and interpret the effectiveness, safety, and mechanisms of action of herbal remedies is essential for creating a more comprehensive view of these treatments. While studies on herbal medicine often focus on clinical outcomes or biochemical properties, few explore the subjective experiences of those who rely on these remedies. The importance of investigating these personal experiences is evident in the growing interest in integrative healthcare, where both traditional and modern medical practices intersect. As individuals increasingly turn to herbal treatments, it becomes essential to examine not just the physical effects, but also how users make meaning of their experiences and how these perceptions influence their health choices.

A significant challenge in this area is the methodological difficulty of capturing the depth and richness of subjective experiences (Karunarathna dkk., 2024). Traditional quantitative approaches, such as clinical trials, tend to prioritize measurable outcomes and controlled variables, which often fail to account for the personal and cultural contexts in which herbal medicines are used. These methods are less suited for exploring the nuances of human experience, particularly the emotional, cognitive, and existential dimensions of health and treatment. Furthermore, the reliance on standardized measures in quantitative research overlooks the diversity of individual experiences and the meanings users attach to their health practices. The use of qualitative methods, particularly phenomenology, offers a more suitable framework to explore these complexities, as it emphasizes the exploration of personal meaning-making in context.

While previous studies have provided valuable insights into the effectiveness and safety of herbal medicines, they often fall short in capturing the full essence of the experience (Kim dkk., 2022). For example, clinical studies may demonstrate the efficacy of a particular herb for treating a condition, but they do not provide a deep understanding of how users perceive the herb's impact on their well-being, nor do they account for the social and cultural factors influencing their perceptions. This lack of attention to subjective experience makes it difficult to understand the broader implications of herbal medicine use, particularly when integrating these treatments into conventional healthcare practices.

Thus, the limitations of previous research methodologies—particularly those that rely on quantitative approaches—underscore the need for a phenomenological investigation. By focusing on the lived experiences of herbal medicine users, this research aims to offer a richer, more holistic understanding of how individuals interact with these remedies and the meanings they derive from their use.

Although research on herbal medicine continues to advance, the majority of existing studies tend to rely on practical and quantitative approaches that focus on measuring effectiveness, dosage, and clinical outcomes. While this approach is important for determining the efficacy of herbal medicines in a medical context, it is often limited in capturing the personal experience and subjective meaning that users associate with these treatments. Data generated from quantitative research tends to overlook contextual, emotional, and cognitive factors that shape how individuals interact with and interpret the use of herbal medicine. As a result, there is a lack of deeper understanding regarding how social,

cultural, and psychological influences shape their perceptions of the effectiveness and safety of herbal treatments.

Therefore, while traditional approaches have provided valuable insights into the pharmacological effects of herbal medicine, they fail to reveal the essence of the user experience. This becomes a significant issue because an individual's perception of herbal medicine is heavily influenced by their social and personal context, which cannot be understood through quantitative data alone. For example, while a herbal product may be statistically proven to be effective, the subjective experience of the user—how they feel the benefits, the sense of safety they experience, or how they interpret the healing process—often does not emerge in quantitative research.

The phenomenological approach offers an alternative, more holistic solution for exploring these experiences. By emphasizing a deep understanding of the subjective meaning attributed by users, phenomenology can reveal the unique ways in which individuals experience, interpret, and assign meaning to the use of herbal medicine in their lives. This method allows researchers to access richer insights into personal experiences and how these elements shape health decisions and care practices. Therefore, this study aims to address the gaps in the existing literature by exploring the experiences of herbal medicine users in greater depth and detail through a phenomenological approach.

Research on the use of herbal medicine has made significant progress, but there remains a gap in understanding the subjective experiences of users in the context of this treatment. Several previous studies have examined the clinical effectiveness of herbal medicine, but few have explored users' experiences in depth (Sarris et al., 2011; Sivasubramaniam et al., 2013). Existing literature indicates that, while the effectiveness of herbal medicines is often reported in quantitative studies, understanding how users perceive the benefits and challenges of using herbal medicine remains limited (Coon & Ernst, 2004). Therefore, research that delves into users' subjective experiences is crucial to fill this gap and provide a more holistic perspective on this phenomenon.

The phenomenological method has been chosen for this study to explore herbal medicine users' experiences in greater depth. This approach allows for a broader exploration of how individuals interpret the use of herbal medicine within the context of their health, including the effects they perceive, their perceptions of safety, and their interactions with other pharmaceutical drugs. Phenomenology, with its focus on the lived experiences of subjects, is well-suited to address the gaps found in previous literature, which often overlooks subjective aspects and deep meanings (Giorgi, 2009). This approach offers the opportunity to understand the emotional, cognitive, and social dimensions of herbal medicine users' experiences, which cannot be captured through quantitative data alone. Thus, this study aims to provide new insights into the personal experiences of herbal medicine use.

This article is organized into several interconnected sections. Following this introduction, we discuss the background of the phenomenon of herbal medicine use and the methodological challenges that exist. The next section will outline the phenomenological approach employed in this study, including the process of data collection and analysis. We will explain how in-depth interviews and thematic analysis were used to uncover the meanings embedded in users' experiences. Finally, the discussion of the results and conclusions will offer an interpretation of the findings and their implications for herbal medicine practice.

RESEARCH METHODS

Study Design

This research adopted a phenomenological approach to explore the subjective experiences of individuals using herbal medicine (Kumari dkk., 2024). Phenomenology, as a qualitative research design, focuses on understanding the essence of human experiences and how individuals perceive and make sense of those experiences. This approach is particularly suitable for exploring the lived experiences of herbal medicine users, as it allows for an in-depth investigation of personal meaning-making processes related to the use, effectiveness, safety, and mechanisms of herbal remedies. The phenomenological design is aimed at uncovering the deeper meanings and insights participants attribute to their experiences with herbal treatments, shedding light on their perceptions, knowledge, and

understanding of this alternative healthcare practice. In this study, an interpretative phenomenological approach was employed, as it seeks not only to describe the experiences of participants but also to interpret the meanings behind their actions and perceptions within their unique cultural and personal contexts.

Participants

The study involved a purposive sample of 10-15 individuals who had been using herbal medicine regularly for a period of at least three months. Participants were selected based on the inclusion criteria of having experience with herbal remedies for the management of specific health conditions, such as hypertension, diabetes, or digestive disorders. Additionally, participants were required to have a basic understanding of the herbal products they were consuming. The inclusion criteria aimed to ensure that participants could provide detailed insights into their experiences and perceptions of herbal medicine. Individuals who had recently started using herbal remedies or were unable to articulate their experiences and knowledge in detail were excluded from the study. The participants' age, gender, and health conditions varied, contributing to a broad range of experiences that enriched the study's findings. Demographic information such as the participants' gender and age was recorded, although these details were secondary to the focus on their experiences with herbal medicine.

Data Collection

Data was collected through in-depth, semi-structured interviews, which allowed for flexibility in exploring participants' individual experiences. The interviews were designed to encourage open-ended responses and were guided by a pre-established interview protocol, which included key questions about participants' perceptions of the effectiveness, safety, and mechanisms of action of the herbal remedies they used (Lee dkk., 2022). The interviews were conducted face-to-face at locations chosen by the participants, ensuring a comfortable and familiar environment for them. Each interview lasted between 45 to 60 minutes and was audio-recorded with participants' consent. The semi-structured format of the interviews facilitated the exploration of new topics as they arose during the conversation, while still ensuring that all relevant themes related to the research questions were addressed. To further enrich the data, field notes were taken during the interviews to capture non-verbal cues and contextual observations.

Data Analysis

The data were analyzed using thematic analysis, which is a widely used method in phenomenological research for identifying and interpreting patterns within qualitative data. Thematic analysis was chosen for its ability to organize complex data into themes that reflect participants' experiences and perceptions. The analysis was conducted in several stages: first, the interview transcripts were read multiple times to ensure familiarization with the data. Then, significant statements and phrases were highlighted, and initial codes were assigned. These codes were grouped into broader themes based on commonalities and relationships across participants' responses. As part of the interpretative phenomenological approach, the analysis not only focused on describing these themes but also sought to interpret the underlying meanings and contextual factors influencing participants' experiences. NVivo software was used to facilitate the organization of the data and thematic coding, although the primary focus remained on manual, interpretative analysis of the texts.

Ethics

The study adhered to ethical standards in line with international research guidelines. Ethical approval for the study was obtained from the relevant research ethics committee before data collection began. Participants were provided with a comprehensive informed consent form outlining the purpose of the study, the voluntary nature of their participation, and the measures taken to ensure confidentiality. All participants gave written consent to participate in the study and were assured that their identities would remain anonymous. Data were stored securely and only accessible to the research team. To protect participants' privacy, any personal identifiers were removed from the transcripts, and pseudonyms were used in place of real names. The study complied with the ethical guidelines set forth by the Declaration of Helsinki and other relevant ethical standards for qualitative research.

RESULTS

Perceived Effectiveness of Herbal Medicine

The majority of participants reported positive experiences with herbal medicine, expressing satisfaction with its perceived effectiveness in managing various health conditions. Several participants shared that they experienced improvements in their health, often citing a feeling of increased well-being after using herbal remedies. One participant described their experience as follows:

"After I started using herbal medicine for my hypertension, I felt more energized, and my blood pressure has been more stable. I believe it works better for me than the prescription drugs I used to take." (Participant 3)

Another participant noted that the perceived effectiveness of herbal remedies sometimes occurred more rapidly than conventional pharmaceuticals:

"I feel the effects of the herbal treatment quicker than the chemical ones. It's almost as if my body responds faster to natural ingredients." (Participant 7)

Despite these positive accounts, some participants acknowledged that they also continued to take conventional medication alongside herbal remedies. This suggests that while herbal medicine is valued for its perceived effectiveness, it is often viewed as complementary rather than a sole treatment option.

Concerns About Safety and Long-Term Effects

While the safety of herbal medicine was largely perceived as a strength, some participants expressed concerns regarding potential long-term effects and the lack of scientific evidence supporting the safety of these treatments. One participant reflected on their uncertainty:

"I use herbal medicine because I feel it's safer. But sometimes I wonder if it will have any side effects in the long run. We don't know for sure how these herbs affect the body over many years." (Participant 5)

Another common concern was the potential for interactions between herbal remedies and pharmaceutical drugs. Several participants admitted that they did not fully understand how these two types of treatments might interact, though they reported feeling reassured by the "natural" label of the products. One participant commented:

"I never thought about whether the herbs could interact with my prescribed medicines. I just trust that natural products are safer." (Participant 10)

This lack of awareness regarding potential drug interactions highlights the need for greater education on the safety of combining herbal and pharmaceutical treatments.

Limited Knowledge of Mechanisms of Action

A striking theme across the interviews was the participants' limited understanding of the mechanisms of action of the herbal medicines they used. While many were confident in the effectiveness of herbal remedies, they generally lacked in-depth knowledge about how the active compounds in these products work within the body. One participant explained:

"I don't really know how the herbs work, but I believe in them. They've helped me feel better, and that's what matters." (Participant 2)

Another participant described their limited knowledge as follows:

"I know that herbal medicine is good for me, but I don't know exactly how it affects my body. I just trust that it's something from nature, so it's better." (Participant 8)

This lack of understanding regarding the pharmacological mechanisms behind herbal medicine underscores the importance of further scientific investigation into the pharmacokinetics and pharmacodynamics of these treatments.

Lack of Awareness About Herbal-Pharmaceutical Interactions

Many participants admitted to being unaware of the potential interactions between herbal remedies and pharmaceutical medications. This lack of awareness was particularly evident in cases where participants combined both types of treatments without consulting healthcare providers. One participant described their experience:

"I take my herbal medicine and also my blood pressure pills, but I never thought to ask if they work well together. I just keep taking them because they seem to help." (Participant 4)

Such comments indicate that, while herbal medicine is widely accepted, there is insufficient understanding regarding the complex interactions between natural and synthetic treatments. This gap in knowledge could have significant implications for patient safety, especially when herbal products are used in combination with prescribed medications.

In summary, the findings from this phenomenological study indicate that users of herbal medicine generally perceive these treatments as effective and safe, with many citing positive personal experiences. However, a significant gap in understanding exists regarding the mechanisms of action of herbal remedies and the potential for interactions with conventional pharmaceutical drugs. The results suggest a need for greater education and research to clarify the safety profiles and mechanisms of action of herbal products, as well as to increase awareness about the risks of combining herbal and pharmaceutical treatments.

DISCUSSION

This study reveals that the experiences of herbal medicine users consist of two main elements: a sense of safety and a quick perception of positive effects, although most participants do not fully understand the mechanisms of action or the interactions between herbal medicines and other pharmaceutical drugs (Naderi dkk., 2024). These findings highlight a gap between users' beliefs about the safety and effectiveness of herbal medicines and their limited understanding of the scientific basis and potential risks associated with their use.

The findings of this study provide profound insights into the subjective experiences of herbal medicine users, which are often overlooked in previous clinical studies. As discussed in the Introduction, the main research question focused on how users interpret their experiences with herbal medicines and the mechanisms of action involved (Sopjani dkk., 2024). This study shows that while many users feel more comfortable using herbal medicines, there is also a significant lack of understanding regarding how herbs interact with the body and with other pharmaceutical drugs. This highlights the need for better education on pharmacokinetics and the potential for drug interactions. Therefore, this research fills a gap in the existing literature by providing a more holistic understanding of how individuals perceive and make sense of herbal medicine use within the context of their health.

The results of this study are consistent with previous findings that show, despite many users' belief in the effectiveness and safety of herbal medicines, their understanding of the mechanisms of action and interactions with other drugs tends to be limited (Sarris et al., 2011; Ernst, 2000). Existing literature often notes that users' confidence in herbal medicines is driven by cultural perceptions or personal experiences, without sufficient scientific support to confirm these claims (Coon & Ernst, 2004). Meanwhile, this study reinforces the idea that this phenomenon involves not only biological aspects but also psychological and social elements that shape how users access and use herbal medicines in daily life (Subali dkk., 2024). These findings complement theories that suggest individual experiences with herbal treatments cannot be fully understood through medical or scientific parameters alone, but must be considered within a broader context that includes perception, culture, and social background.

Explanation of the Implications of Findings

The findings of this study have significant implications both in scientific and practical contexts. Scientifically, the results emphasize the importance of a more holistic approach to understanding herbal medicine users' experiences, one that involves physical, psychological, and social aspects (Thakur dkk., 2023). This opens opportunities for the integration of conventional and alternative medicine through a

better understanding of drug interactions, side effects, and the cultural influences on public perception. From a practical perspective, the findings provide valuable insights for healthcare professionals and policymakers to design more effective educational programs related to herbal medicine use, with a focus on improving medical literacy and understanding the potential risks involved. On the other hand, these findings are also relevant in social and cultural contexts, where the use of herbal medicine is often influenced by local traditions and beliefs, factors that should be considered when designing public health interventions.

Study Limitations

There are several limitations in this study that should be considered. First, the study uses a limited sample size (10-15 participants), which may not fully represent the broader population of herbal medicine users. Second, the focus of the research on participants' subjective experiences was confined to specific types of herbal medicines used in their daily lives, meaning that these findings cannot be generalized to all types of herbal medicine or all herbal user communities (Verma dkk., 2024). Additionally, limitations inherent in the phenomenological method include the potential for bias in data interpretation, although validation and triangulation steps were applied to mitigate this. Further research with a larger and more diverse sample, as well as a more systematic approach, could provide deeper insights.

Prospective Statement for Future Research

This study paves the way for further exploration of herbal medicine users' experiences in various cultural and social contexts (Wang dkk., 2017). Future research could involve larger longitudinal studies to reveal the long-term dynamics of herbal medicine use, particularly with regard to changes in users' perceptions and understanding over time. Additional studies could also examine in more depth the potential interactions between herbal medicines and pharmaceutical drugs within broader clinical contexts, and provide more detailed guidelines regarding dosage, safety, and effectiveness of herbal treatments. Expanding this research is expected to make a more substantial contribution to the development of evidence-based medicine and the integration of conventional and alternative healthcare.

CONCLUSION

This study explored the effectiveness and safety of herbal medicine from the perspective of its users, addressing the gap in understanding the biological mechanisms and interactions with conventional pharmaceuticals. The findings revealed that while many participants perceived herbal remedies as both safe and effective, they had limited knowledge of the underlying mechanisms of action and potential interactions with other medications. The research highlights the importance of providing clear educational resources to improve users' understanding of herbal medicine and its integration with conventional treatments. These insights contribute to the growing body of literature on the use of herbal medicines, bridging the gap between subjective user experiences and scientific knowledge. Future research could expand on this study by examining the long-term effects and clinical implications of herbal medicine use, particularly in diverse cultural contexts. Further exploration of the pharmacokinetics and safety profiles of herbal remedies could offer valuable contributions to healthcare practices.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

REFERENCES

- Asgharian, P., Quispe, C., Herrera-Bravo, J., Sabernavaei, M., Hosseini, K., Forouhandeh, H., Ebrahimi, T., Sharafi-Badr, P., Tarhriz, V., Soofiyani, S. R., Helon, P., Rajkovic, J., Durna Daştan, S., Docea, A. O., Sharifi-Rad, J., Calina, D., Koch, W., & Cho, W. C. (2022).

- Pharmacological effects and therapeutic potential of natural compounds in neuropsychiatric disorders: An update. *Frontiers in Pharmacology*, 13. Scopus. <https://doi.org/10.3389/fphar.2022.926607>
- Ayati, Z., Sarris, J., Chang, D., Emami, S. A., & Rahimi, R. (2020). Herbal medicines and phytochemicals for obsessive–compulsive disorder. *Phytotherapy Research*, 34(8), 1889–1901. Scopus. <https://doi.org/10.1002/ptr.6656>
- Banerjee, A., Sriramulu, S., Catanzaro, R., He, F., Chabria, Y., Balakrishnan, B., Hari, S., Ayala, A., Muñoz, M., Pathak, S., & Marotta, F. (2023). Natural Compounds as Integrative Therapy for Liver Protection against Inflammatory and Carcinogenic Mechanisms: From Induction to Molecular Biology Advancement. *Current Molecular Medicine*, 23(3), 216–231. Scopus. <https://doi.org/10.2174/1566524022666220316102310>
- Cui, A., Liu, H., Liu, X., Zhang, M., Xiao, B., Wang, B., & Yang, J. (2024). Steroidal saponins: Natural compounds with the potential to reverse tumor drug resistance (Review). *Oncology Letters*, 28(6). Scopus. <https://doi.org/10.3892/ol.2024.14719>
- Farzaei, M. H., Bahramsoltani, R., Abdolghaffari, A. H., Sodagari, H. R., Esfahani, S. A., & Rezaei, N. (2016). A mechanistic review on plant-derived natural compounds as dietary supplements for prevention of inflammatory bowel disease. *Expert Review of Gastroenterology and Hepatology*, 10(6), 745–758. Scopus. <https://doi.org/10.1586/17474124.2016.1145546>
- Huang, Y.-C., Sung, M.-Y., Lin, T.-K., Kuo, C.-Y., & Hsu, Y.-C. (2024). Chinese herbal medicine compound of flavonoids adjunctive treatment for oral cancer. *Journal of the Formosan Medical Association*, 123(8), 830–836. Scopus. <https://doi.org/10.1016/j.jfma.2023.10.009>
- Jiang, X., Yin, H., Su, W., Quan, H., Yuan, X., Feng, X., Li, P., He, Y., Xiao, J., & Li, R. (2023). Trifolirhizin inhibits proliferation, migration and invasion in nasopharyngeal carcinoma cells via PI3K/Akt signaling pathway suppression. *Biochemical and Biophysical Research Communications*, 667, 111–119. Scopus. <https://doi.org/10.1016/j.bbrc.2023.05.030>
- Karunarathna, S. C., Lu, W., Patabedige, N., Zhao, C.-L., & Hapuarachchi, K. K. (2024). Unlocking the therapeutic potential of edible mushrooms: Ganoderma and their secondary metabolites as novel antiviral agents for combating COVID-19. *New Zealand Journal of Botany*. Scopus. <https://doi.org/10.1080/0028825X.2024.2384453>
- Kim, Y. H., Jung, J. I., Jeon, Y. E., Kim, S. M., Hong, S. H., Kim, T. Y., & Kim, E. J. (2022). Gynostemma pentaphyllum extract and its active component gypenoside L improve the exercise performance of treadmill-trained mice. *Nutrition Research and Practice*, 16(3), 298–313. Scopus. <https://doi.org/10.4162/nrp.2022.16.3.298>
- Kumari, P., Alam, A., Dhoundiyal, S., Kaur, A., & Yadav, S. (2024). Treatment Considerations to Overcome the Barriers Associated with Skin Cancer Targeting. *Current Cancer Therapy Reviews*, 20(6), 529–545. Scopus. <https://doi.org/10.2174/0115733947253349231027043858>
- Lee, K., Youn, B.-Y., Choi, Y.-J., Moon, S., Im, J., Cho, K., Ko, S.-G., & Cheon, C. (2022). State of the Art and Future Implications of SH003: Acting as a Therapeutic Anticancer Agent. *Cancers*, 14(4). Scopus. <https://doi.org/10.3390/cancers14041089>
- Naderi, M., Salavatiha, Z., Gogoi, U., & Mohebbi, A. (2024). An overview of anti-Hepatitis B virus flavonoids and their mechanisms of action. *Frontiers in Cellular and Infection Microbiology*, 14. Scopus. <https://doi.org/10.3389/fcimb.2024.1356003>
- Sopjani, M., Falco, F., Impellitteri, F., Guarrasi, V., Nguyen Thi, X., Dërmaku-Sopjani, M., & Faggio, C. (2024). Flavonoids derived from medicinal plants as a COVID-19 treatment. *Phytotherapy Research*, 38(3), 1589–1609. Scopus. <https://doi.org/10.1002/ptr.8123>
- Subali, D., Kurniawan, R., Surya, R., Lee, I.-S., Chung, S., Ko, S.-J., Moon, M., Choi, J., Park, M. N., Taslim, N. A., Hardinsyah, H., Nurkolis, F., Kim, B., & Kim, K.-I. (2024). Revealing the mechanism and efficacy of natural products on treating the asthma: Current insights from

- traditional medicine to modern drug discovery. *Heliyon*, 10(11). Scopus. <https://doi.org/10.1016/j.heliyon.2024.e32008>
- Thakur, A., Prasad, N., Raina, K., Sharma, R., & Chaudhary, A. (2023). Role of Plant-Based Anticancer Compounds in Treatment of Breast Cancer. *Current Pharmacology Reports*, 9(6), 468–488. Scopus. <https://doi.org/10.1007/s40495-023-00335-x>
- Verma, N., Aggarwal, N., & Sood, P. (2024). Exploring the phytochemistry and biological potential of *T. minuta* (L.): A comprehensive review. *South African Journal of Botany*, 168, 175–195. Scopus. <https://doi.org/10.1016/j.sajb.2024.03.004>
- Wang, Z., Yang, L., Fan, H., Wu, P., Zhang, F., Zhang, C., Liu, W., & Li, M. (2017). Screening of a natural compound library identifies emodin, a natural compound from *Rheum palmatum* linn that inhibits DPP4. *PeerJ*, 2017(5). Scopus. <https://doi.org/10.7717/peerj.3283>