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REVIEW ARTICLE

Section: *Philosophy & Religion***Can a river be an actor? Rethinking human–non-human relations in the ecological epistemology of the Semende indigenous community**Widya Lestari¹, Nita Amriani¹, Murniyati Putri Wole¹, Putri Athifah Fitriah¹ & Ikrana Ramadhani¹¹Center for Religion and Cross-cultural Studies (CRCS), Graduate Building School, Gadjah Mada University, Indonesia*Correspondence: widyalestari1999@mail.ugm.ac.id**ABSTRACT**

This study examines how the Semende Indigenous community in South Sumatra understands rivers as spiritual actors and how their ecological practices reflect the interconnected relationship between humans and non-humans. The study employs a qualitative approach using a literature review method that analyzes literature on Actor-Network Theory (ANT), Indigenous ecological knowledge, environmental reports, and studies on the Semende community. The findings show that through the *Tumutan Tujuh* tradition, the Semende people regard rivers as sacred living entities with spiritual agency that play an important role in sustaining social, ecological, and spiritual life. This understanding is reflected in customary regulations, rituals honoring water sources, the protection of upstream areas, and the role of customary leaders in maintaining environmental sustainability. From the perspective of ANT, rivers function as non-human actors that shape community values, norms, and social practices. The study also reveals that humans, rivers, forests, plants, and animals are understood as interconnected parts of a shared ecological network. These findings highlight the contribution of Indigenous ecological knowledge to environmental conservation and offer an ecological justice paradigm that recognizes non-human agency.

KEYWORDS: Semende indigenous community, actor-network theory, non-human agency, traditional ecological knowledge

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1. Introduction

The current ecological crisis shows that the modern view of nature has caused serious environmental damage. This perspective separates humans from nature and places humans as masters who have the right to exploit natural resources for their own interests. Within the framework of modernity, nature is seen as a passive object that can be used without limits. Such a perspective ignores the fact that humans and nature live in a close and interdependent relationship. Bruno Latour criticizes this view by arguing that humans have never been separated from nature. Through Actor-Network Theory (ANT), Latour emphasizes that humans and non-humans, such as animals, rivers, trees, and other natural elements, are actors connected within a social network. All these actors play important roles and influence the formation of collective life (Latour, 2005). In other words, nature is not merely a passive background but possesses agency and active power that influence human life.

In Indonesia, many Indigenous communities hold perspectives and practices that are consistent with this paradigm. One example is the Semende Indigenous community in South Sumatra. The Semende people are known for maintaining a close and harmonious relationship with nature, especially rivers and forests. In their daily lives, they practice sustainable farming systems such as intercropping and uphold customary values such as *Tumutan Tujuh*, which emphasizes balance, responsibility, and environmental preservation across generations. For the Semende people, rivers are not only sources of water or transportation routes but also sacred life systems. Rivers are believed to possess spirits and power; therefore, they must be respected and protected. In various customary rituals, the community offers ceremonial gifts to rivers as a form of communication and respect. Thus, rivers are positioned not only as sources of life but also as important parts of their spiritual life. However, the harmonious relationship between the Semende community and nature is currently facing serious threats. Over the past few decades, industrial expansion, including mining and large-scale plantation activities, has entered customary territories, including upstream areas that have long been protected by local communities. These activities have not only damaged physical environments such as forests and rivers but have also disrupted local social and cultural systems. This situation is evident in Lahat Regency, South Sumatra, where the Semende people reside. Gold mining activities, both legal and illegal, have caused river pollution, reduced water discharge, and increased sedimentation and heavy metal contamination, threatening environmental health and ecosystem sustainability. As a result, local communities can no longer rely on rivers as sources of livelihood and spirituality as they once did (Ismi, 2024; Wahana Lingkungan Hidup Indonesia, 2023).

According to reports from the Wahana Lingkungan Hidup Indonesia (WALHI), by 2022 there were at least 109 Mining Business Permits (IUPs) in South Sumatra, most of which were located near forest and river areas, including the Semende region. WALHI reported increasing river pollution and declining soil quality within mining concession areas, directly affecting the livelihoods of Indigenous communities (Wahana Lingkungan Hidup Indonesia, 2023). Studies have also found that heavy metals such as mercury (Hg) and arsenic (As), originating from traditional gold mining activities in the Upper Lematang and Rawas regions, have exceeded acceptable water quality standards. This condition poses serious risks to human health and disrupts the balance of aquatic ecosystems (Fadli et al., 2025). These findings strengthen the argument that mining activities, often promoted by the state as development projects, can threaten local networks of life that have existed for centuries. In addition to environmental degradation, industrial expansion has also disrupted customary values and local knowledge systems. The Semende community has customary regulations governing the sustainable use of natural resources. They practice a customary zoning system to protect upstream and downstream river areas and regulate planting and harvesting periods based on ecological knowledge passed down through generations. When these living spaces are disturbed, not only are ecosystems damaged, but the community's value system and cultural identity are also affected. This phenomenon reflects an imbalance in natural resource governance. The state and corporations often become dominant actors in determining the value and function of a territory, while local communities and natural elements such as rivers and forests are rarely recognized as actors with rights and voices. In this context, Latour's approach offers a useful framework for understanding the situation. Latour proposes the reconstruction of social and political structures by involving all actors, including non-humans, as equal participants within networks of life (Latour, 2005). From this perspective, rivers should be understood not only as resources but also as ecological and social actors that shape the structure of community life. Through their local wisdom, the Semende people have practiced this understanding long before ANT was developed. They view rivers as part of an extended family that must be cared for, respected, and included in

decision-making processes. Therefore, the knowledge and practices of the Semende community are not only important for local interests but are also relevant to global efforts to rebuild a more just and sustainable relationship between humans and nature.

Through this study, the researcher considers it important to understand more deeply how Indigenous communities interpret nature as an active part of their social lives. Based on this context, the study formulates two main research questions: (1) How do the Semende people understand rivers as spiritual actors in their lives? and (2) Do the ecological practices of the Semende community demonstrate that humans and non-humans are inseparable parts of a unified ecological network? To answer these questions, this study explores the perspectives of the Semende people using Actor-Network Theory developed by Bruno Latour. The researcher assumes that this study will reveal alternative ways of understanding human–nature relations that are more environmentally harmonious, while also enriching academic and policy discussions on ecological justice amid the worsening environmental crisis.

2. Research Methodology

This study employs a qualitative approach using a literature review as the primary data collection method. The literature review method was selected to explore the ecological perspectives and practices of the Semende Indigenous community through the framework of Actor-Network Theory (ANT) developed by Bruno Latour. A literature review enables researchers to examine, identify, and analyze various relevant written sources, including scholarly articles, environmental organization reports, books, and field documentation published by credible media sources. The sources analyzed in this study include Bruno Latour's theoretical works, particularly "We Have Never Been Modern (1993)" and "Reassembling the Social: An Introduction to Actor-Network Theory (2005); empirical and ethnographic studies on the Semende Indigenous community; articles and reports published by Mongabay Indonesia, WALHI, and environmental journals; as well as literature discussing political ecology, local knowledge, and ecological justice.

The data collected from these literature sources were analyzed using thematic and descriptive approaches. Thematic analysis was conducted to identify patterns of meaning related to the understanding of rivers, human–non-human relations, and the spiritual-ecological values practiced by the Semende community. Meanwhile, the descriptive approach was used to develop a conceptual framework that connects the findings from the literature with the theoretical framework of ANT. Through this literature review, the study seeks to develop a critical and reflective understanding of how the local knowledge of the Semende Indigenous community contributes to the formation of alternative ecological narratives that are more inclusive of non-human agency. Therefore, this research not only expands the discussion on human–nature relationships but also offers a new perspective for understanding ecological justice in the context of increasingly complex environmental crises.

3. Literature Review

a. Human-Non-Human Relations in the Indigenous Peoples Paradigm

Actor-Network Theory (ANT) argues that the social world is shaped not only by humans but also by non-human entities such as animals, rivers, forests, and various other objects. Latour states that all actors, both human and non-human, play active roles in forming social networks. ANT rejects the dichotomy between nature and society and promotes the understanding that reality is constructed through interdependent relationships among various entities (Latour, 1993, 2005). A similar perspective can be found in relational ontology studies in anthropology, particularly in the works of Philippe Descola and Eduardo Viveiros de Castro. Both scholars emphasize that Indigenous communities often do not separate "culture" and "nature." Instead, they view them as interconnected through reciprocal spiritual, social, and ecological relationships (Castro & Skafish, 2014; Descola, 2012). From this perspective, rivers and forests can be understood as possessing agency in ways like humans. Gauthier highlights how Indigenous communities build reciprocal relationships with rivers as part of kinship networks within their living landscapes. This idea opens new epistemological possibilities for understanding ecological justice from a non-anthropocentric perspective (Gauthier, 2020). Indigenous communities in many regions also possess strong local knowledge systems for environmental conservation. Based on spirituality and knowledge passed down through generations, they practice ecological traditions that emphasize balance rather than exploitation (Berkes, 2012). Kimmerer likewise emphasizes the importance of Traditional Ecological Knowledge

(TEK) as an alternative source of knowledge for promoting ecological sustainability and environmental justice (Kimmerer, 2013).

Research by Acciaioli shows that Indigenous communities often maintain deep emotional and spiritual connections with the landscapes in which they live. These relationships reflect not only economic interactions but also complex belief systems that include respect for rivers, stones, and forests as living entities with their own meanings and significance (Acciaioli, 2001). These studies demonstrate the relevance of ANT as an analytical approach for understanding how Indigenous communities recognize and engage with the agency of non-human actors in their everyday lives.

b. Ecological and Spiritual Practices of the Semende Indigenous Peoples

Traditional Ecological Knowledge (TEK) serves as the foundation for Indigenous communities' practices in maintaining environmental balance. According to Berkes, TEK is a knowledge system built upon experience, spirituality, and collective values that are passed down from generation to generation (Berkes, 2012). Meanwhile, Andrini Sertianti and Singer emphasize that Indigenous communities in Indonesia, including those in Sumatra, possess customary-based territorial management systems that consider ecosystem sustainability (Sertianti & Singer, 2025). This context can be seen in the practices of the Semende community through the *Tumutan Tujuh* system, a set of customary values that collectively regulate the management of forests and rivers. *Tumutan Tujuh* not only governs territorial boundaries and land ownership rights within Semende families but also includes customary prohibitions against forest destruction, illegal logging, and river pollution. This system reflects a socio-ecological relationship grounded in spirituality, where humans are viewed as part of the ecosystem and are expected to live in harmony with other elements of nature.

According to reports from Mongabay Indonesia, the Semende community understands rivers as an inseparable part of their spiritual life. Within customary practices, there are various rules prohibiting the disposal of waste into rivers, the indiscriminate cutting of large trees, and the extraction of forest resources without conducting certain rituals. Rivers are believed to have guardians or spiritual protectors that must be respected. Violations of these values are believed to bring misfortune or disrupt social and ecological balance (Mongabay, 2024). Research by Zainal Arifin also confirms that systems such as *Tumutan Tujuh* are not merely normative rules but function as social institutions with strong legitimacy within the Semende community (Arifin et al., 2023). These values are transmitted orally through the advice of parents, village leaders, and customary authorities and are reflected in agricultural and farming practices that adapt to seasonal cycles and soil fertility conditions.

However, reports from WALHI South Sumatra indicate that these practices are currently under threat due to mining expansion in the upstream area of the Lematang River, which has caused environmental degradation and ecological damage (Wahana Lingkungan Hidup Indonesia, 2023). Gold mining activities, both traditional and licensed, in South Sumatra have increased the concentration of heavy metals in water bodies beyond levels considered safe for human health and ecosystem sustainability (Noviansyah, 2023). Furthermore, Salmudin and colleagues argue that local wisdom systems such as *Tumutan Tujuh* have significant potential to be integrated into community-based natural resource management policies. Recognition of such customary systems could strengthen community-based conservation efforts while reducing land conflicts arising from power imbalances among the state, corporations, and Indigenous communities (Salmudin et al., 2021).

Therefore, the *Tumutan Tujuh* practice represents not only local ecological knowledge but also a complex and structured system of spirituality, environmental governance, and nature protection. From the perspective of Actor-Network Theory, rivers and forests within this system are not viewed merely as natural resources but as actors within a social network that possess agency, are respected for their existence, and actively contribute to shaping the collective life of the Semende community.

4. Finding & Discussion

a. *Tumutan Tujuh* and the River as Living Spiritual Entities

The term *Tumutan Tujuh* comes from the local language and means “touching blessings.” It refers to the seven main springs that support the lives of the Semende people. These seven water sources include the Lematang River, Bengkenang River, Enim River, Padang Guci River, Kinal River, Kendurang Spring, and Endikat River.

In the Semende worldview, these water sources are regarded as sacred entities that play an important role in maintaining both community well-being and environmental balance. Therefore, spring areas are designated as protected zones, and various prohibitions are imposed against activities that may damage the environment, such as littering or cutting trees in upstream river areas (Noviansyah, 2023; Wijaya, 2025). These prohibitions function not only as social norms, but also as operational rules enforced through customary sanctions.

Furthermore, the *Tumutan Tujuh* system includes various rituals aimed at maintaining harmonious spiritual relationships between humans and water sources. These rituals involve prayers addressed to the guardian spirits of water and symbolic acts of respect through tree planting along riverbanks (Salmudin et al., 2021). These practices demonstrate that *Tumutan Tujuh* is not merely a water resource management system but also reflects the Semende people's worldview, which regards rivers as living entities possessing spiritual agency. This perspective is reflected in the statement of a community leader who said, "If this water is damaged, we believe a great disaster will occur." This statement illustrates the collective awareness that these life-giving water sources possess powers that go beyond their physical functions and influence the well-being of the community (Wijaya, 2025; Yuliani, 2025). Within the Semende customary structure, there are traditional leaders such as *Datuk Aik* and *Datuk Turbin* who play important roles in protecting water sustainability. *Datuk Aik* is responsible for monitoring the flow and quality of spring water and serves as a spiritual guardian who ensures that rivers remain clean and continue to flow properly. Meanwhile, *Datuk Turbin* is responsible for managing energy generated from water-based turbines that support village life. The existence of these customary leaders demonstrates social and institutional recognition of rivers as living entities that deserve respect and consideration in community life (Yuliani, 2025).

This perspective is also emphasized by, a Buyung customary leader from Segamit Village, who stated that "damaging water is the same as damaging the life of the Semende people." This statement reflects a personal, emotional, and spiritual relationship between humans and rivers (Mongabay Indonesia, 2024). In practice, this relationship is expressed through customary regulations, including the prohibition of cutting large trees along riverbanks. These rules function as collective actions to maintain ecosystem sustainability, based not only on ecological considerations but also on the spiritual belief that harmony in nature determines human well-being. Therefore, customary regulations perform a dual function: protecting ecosystems while preserving the sacred values of tradition from exploitative practices, whether originating from within the community or from external actors (Paing et al., 2025; Syamsiah et al., 2024). Respect for water sources is also expressed through various customary rituals, such as cleaning spring areas, conducting communal prayers, and carrying out environmental maintenance activities. These practices reinforce the position of rivers as actors with both spiritual and ecological dimensions. The connection between spirituality and ecology is further reflected in a bottom-up environmental governance model, in which community members independently develop mechanisms for river protection. One example is the customary fine of one million Indonesian rupiah imposed for every tree cut down in upstream spring areas.

These findings demonstrate that rivers play an active role in shaping the social and spiritual practices of the Semende community. Within the framework of Actor-Network Theory (ANT), Latour argues that non-human entities such as rivers can possess agency within social networks because they act as mediators that influence human actions and social relationships. The agency of rivers in Semende society becomes evident when rivers are positioned at the center of community values, social norms, and daily practices. This perspective is consistent with Descola's critique of the modern dichotomy between nature and culture. According to Descola, many Indigenous communities understand natural entities as subjects that possess intentions, values, and ethical positions within collective life (Descola, 2012). Therefore, rivers are viewed not only as ecological objects but also as spiritual actors engaged in reciprocal relationships with human communities.

Similarly, Antonia Sohns argues that rivers can be understood as part of a "sentient ecology," playing a role in advancing ecological justice through the affective and spiritual bonds formed between humans and nature (Sohns et al., 2024). In the Semende context, the *Tumutan Tujuh* ritual embodies concepts of blessing, responsibility, and protection that position community members as environmental guardians with both spiritual and ecological responsibilities. This pattern of relationships aligns with Kimmerer's view that humans, plants, and water are partners living together within a relationship of sustainable coexistence (Kimmerer, 2013). Buyung Customry leader's statement further illustrates that, in the Semende worldview, rivers are not understood as

objects to be exploited but as partners in reciprocal relationships based on mutual care and protection. This awareness is reflected in annual rituals and the enforcement of customary restrictions around spring areas. In addition, social systems such as *Tumutan Tujuh* and *Tunggu Tubang* contain principles of ecological sustainability rooted in local spirituality. These principles provide the foundation for managing living spaces by integrating forests, rivers, and agricultural land into a single interconnected ecological system that supports and sustains itself (Huang et al., 2020).

This system not only ensures the sustainability of community livelihoods but also preserves the spiritual values that form the foundation of Semende social life. Therefore, the sustainability of relationships between human and non-human actors within Semende society should receive greater formal recognition in spatial planning policies, village regulations, and participatory governance models. Within this framework, customary leaders, local governments, business actors, and rivers as ecological and spiritual entities should all be considered as part of decision-making processes (Finlayson et al., 2018; Yuan et al., 2022). In conclusion, the socio-ecological structure of Semende society does not draw a rigid distinction between human and non-human actors. Instead, both are understood as participants within a unified network of life. This network is formed through reciprocal relationships that influence, sustain, and require balance across material, social, and spiritual dimensions.

b. Humans and Non-Humans as Inseparable Ecological Subjects

In the worldview of the Semende community, humans do not exist as independent individuals separated from nature. Instead, humans are understood as part of an ecological network closely connected to the surrounding environment, including rivers, forests, plants, and animals. This relationship is not merely utilitarian or based on economic benefits; rather, it carries deep spiritual, social, and ecological meanings. The *Tumutan Tujuh* practice provides a clear example of how humans and non-humans operate as coexisting subjects within a holistic ecosystem. Efforts to protect water source areas are understood not only as physical actions but also as rituals aimed at maintaining spiritual balance. This is reflected in customary prohibitions against littering and cutting trees in upstream areas, which are enforced through customary sanctions. This concept demonstrates that rivers occupy a normative position in community life: rivers not only provide benefits but also require reciprocal responsibilities from humans.

As explained by Latour, rivers can be understood as active non-human actors that shape the social and spiritual behavior of the Semende people. The agency of rivers becomes visible when they “speak” through changes in water flow, ecosystem disturbances, or collective awareness expressed through communal rituals and the enforcement of customary norms. In Semende society, rivers serve as the foundation for social values and actions. Protecting rivers means maintaining social harmony, while damaging them threatens the sustainability of the community.

In addition to rivers, the *Tunggu Tubang* system, a customary institution that places women in a central position, also illustrates ecological interconnectedness within family and community life. In this system, women are responsible for managing rice fields, gardens, and household water resources. Activities such as agricultural rituals, rice harvesting, and waste management demonstrate a high level of ecological awareness (Salmudin et al., 2021). Women within the *Tunggu Tubang* system act as mediators between humans and the environment, ensuring that interactions with nature do not damage the resources that support community life. This interconnected relationship is further reflected in the roles of customary leaders such as *Datuk Aik*, the guardian of spring water flows, and *Datuk Turbin*, the manager of water-based energy systems. The presence of these figures indicates that rivers have received formal recognition within the social structure of the community, not as commodities but as entities that must be considered and included in the governance of collective life. Electricity generated from water turbines is viewed not only as a physical energy source but also as a blessing from nature that carries social and spiritual responsibilities.

These ecological relationships are reflected in various everyday activities, such as planting trees along riverbanks, conducting rituals to clean water sources, and prohibiting resource exploitation without customary permission. The prohibition against cutting trees, accompanied by a customary fine of one million Indonesian rupiah per tree, demonstrates how community-based governance treats rivers as moral and ecological subjects rather than objects that can be freely exploited. In this context, humans and the environment are two

interconnected components within an adaptive system that collectively shapes resilience and sustainability. This reciprocal relationship also becomes evident when environmental disturbances occur. When rivers become polluted, customary systems and rituals respond accordingly. Certain rituals are suspended, spiritual meanings are reinterpreted, and social norms are renegotiated in response to changing conditions. Environmental disruption caused by mining activities reveals the vulnerability of these ecological relationships. Mercury and arsenic pollution have led to river degradation, directly affecting public health, food security, and the spiritual life of the community (Dylan & Smallboy, 2016). Rituals honoring rivers become disrupted, agricultural activities face challenges, and the continuity of the *Tunggu Tubang* system comes under pressure (Wahana Lingkungan Hidup Indonesia, 2023). These conditions demonstrate that when one subject within the ecological network, the river is damaged, the entire socio-ecological network is affected.

Despite these challenges, the Semende community demonstrates strong epistemic resilience. They continue to use local wisdom to communicate principles of sustainability to both government institutions and younger generations. This effort shows that local knowledge is not only preserved but also continuously adapted and renewed in response to modern challenges (Kaswandi et al., 2025; Nurhasan et al., 2025). This adaptive knowledge system represents one of the community's strategies for maintaining environmental sustainability while preserving cultural identity. By positioning humans and non-humans as coexisting subjects, the Semende community presents a paradigm that challenges the dominant modern worldview that separates humans from nature. They demonstrate that ecological wisdom is not merely theoretical knowledge but is expressed through practical actions, including customary institutions, collective rituals, alternative energy management, and inclusive systems of responsibility. Conceptually, this perspective reinforces the idea that ecological sustainability and social resilience cannot be separated from the recognition of non-human agency.

The modern paradigm that separates humans from nature has often failed to maintain ecological balance. In contrast, the Semende paradigm, viewed through the perspective of Actor-Network Theory, demonstrates that recognizing rivers and forests as ecological actors is a crucial foundation for fair and sustainable environmental governance. Such recognition should be integrated into spatial planning policies, water resource management, and forest conservation programs. Therefore, the Semende community is not only advocating for Indigenous rights but also offering a holistic ecological paradigm. This paradigm reminds us that humans and non-humans are not separate entities but interconnected elements within a shared network of life. Within this network, water, trees, forests, medicinal plants, animals, and humans all play equally important roles and deserve to be respected, considered, and protected together.

5. Conclusion

In the life system of the Semende Indigenous community, rivers are not viewed as passive objects that exist solely for human use. Instead, they are understood as important actors within an ecological network that shapes and sustains social, spiritual, and environmental life. Through the practice of *Tumutan Tujuh*, the community develops reciprocal relationships with seven main water sources that are regarded as living, sacred entities possessing spiritual agency. This relationship is reflected in various practices, such as prohibiting tree cutting in upstream areas, maintaining water quality, and appointing customary leaders such as *Datuk Aik* to protect water sources. These practices demonstrate that environmental sustainability is based not only on ecological considerations but also on spiritual values and collective responsibilities that have been passed down through generations.

From the perspective of Actor-Network Theory (ANT), rivers, as non-human entities, play an active role in mediating social relationships within the community. Rivers influence the formation of values, norms, and spiritual practices that guide the lives of the Semende Indigenous Community. When rivers are damaged, the consequences are not limited to ecological degradation but also threaten the social, economic, and spiritual stability of the community. These findings expand the understanding of sustainability by showing that nature is not merely an object to be managed but a dialogical partner that plays a role in shaping collective life. Furthermore, this study demonstrates that the Semende community views humans and non-humans as inseparable parts of a single interdependent network of life. Rivers, forests, plants, animals, and humans are understood as subjects with their own roles in maintaining ecological balance. This perspective forms the foundation for customary practices that support environmental conservation while strengthening the social resilience of the community.

Recognition of non-human agency is an important step in developing a new paradigm of ecological justice. In the context of an increasingly complex global environmental crisis, approaches that recognize rivers, forests, and other natural elements as subjects with “voices” can help create more ethical, reciprocal, and responsible ecological relationships. The practices carried out by the Semende community demonstrate that local communities can develop sustainable environmental governance models that respectfully include non-human entities in collective life. Therefore, recognizing rivers as ecological actors is important not only for the survival of Indigenous identities and ways of life but also for contributing new epistemological insights into reconstructing human–nature relationships within global environmental governance. The experience of the Semende community reminds us that genuine sustainability can only be achieved when nature is no longer viewed merely as a resource to be exploited but as an equal partner in sustaining life on Earth for present and future generations.

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Conflicts of Interest

The authors declare no conflict of interest.

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Authorship and Level of Contribution

The first author conceived the study, conducted the literature review, analyzed the data, and prepared the initial manuscript draft. The co-authors contributed to the conceptual development, critical review, interpretation of findings, and revision of the manuscript. All authors reviewed and approved the final version of the manuscript.

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