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Non-Tax Revenue Mechanism for Fishing Vessels at the Jepara Public Wharf

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Abstract: This study analyzes the mechanism of Non-Tax State Revenue (PNBP) collection from fishing vessels using the public wharf at Jepara Port and formulates a governance model that balances legality, fiscal effectiveness, and the protection of small-scale fishermen. An embedded single-case study design combines socio-legal analysis, process mapping, semi-structured interview transcripts and observations, and a framework matrix across the dimensions of jurisdiction, tariff classification, collection workflow, data integration, and equity. The results indicate that tariff imposition is determined by the authority of the facility manager and the services utilized, rather than by vessel type alone. Collection proceeds through arrival registration, gross tonnage verification, e-billing, payment, and digital verification, supported by coordination between the Port Operations Unit and the Fisheries Harbor Master. Regulatory overlaps, informal tariff analogies, data fragmentation, limited public outreach, and affordability risks nevertheless persist. The novelty of this research lies in a facility-jurisdiction-proportionality model that requires explicit tariff classification, an integrated registry, an audit trail, limited coordination of authority, a relief pathway, and periodic evaluation.

Keywords: PNBP, Public Wharves, Fishing Vessels, Port Governance, Proportionality.

Indonesian Abstract: Penelitian ini menganalisis mekanisme pemungutan Penerimaan Negara Bukan Pajak (PNBP) dari kapal perikanan yang menggunakan dermaga umum di Pelabuhan Jepara serta merumuskan model tata kelola yang menyeimbangkan legalitas, efektivitas fiskal, dan perlindungan nelayan kecil. Desain studi kasus tunggal tertanam (embedded single-case study) menggabungkan analisis sosio-legal, pemetaan proses, transkrip wawancara semi-terstruktur dan observasi, serta matriks kerangka kerja pada dimensi kewenangan, klasifikasi tarif, alur pemungutan, integrasi data, dan keadilan. Hasil penelitian

menunjukkan bahwa pengenaan tarif ditentukan oleh kewenangan pengelola fasilitas dan jenis layanan yang digunakan, bukan semata-mata berdasarkan jenis kapal. Pemungutan dilakukan melalui pencatatan kedatangan, verifikasi gross tonnage, penerbitan e-billing, pembayaran, dan verifikasi digital, yang didukung oleh koordinasi antara Unit Penyelenggara Pelabuhan dan Syahbandar Perikanan. Namun demikian, masih terdapat tumpang tindih regulasi, analogi tarif informal, fragmentasi data, sosialisasi publik yang terbatas, serta risiko keterjangkauan. Kebaruan penelitian ini terletak pada model yurisdiksi fasilitas-proporsionalitas yang mensyaratkan klasifikasi tarif eksplisit, registri terintegrasi, jejak audit, koordinasi kewenangan yang terbatas, jalur keringanan, dan evaluasi berkala.

Kata Kunci: PNPB, Dermaga Umum, Kapal Perikanan, Tata Kelola Pelabuhan, Proporsionalitas.

INTRODUCTION

Public wharves are public service infrastructure built to support the movement of vessels, goods, passengers, and logistics activities. When the capacity of a fishing port is limited or specialized facilities are damaged, the function of a public wharf can shift to that of a shared facility. This situation occurs at the Port of Jepara, where commercial vessel activity is relatively low, while the fishing wharf cannot be utilized optimally, and the public wharf is located near the Fish Auction Site. Consequently, fishing vessels use the public wharf for mooring, anchoring, and unloading their catch. This change in operational function not only raises capacity issues but also raises questions regarding the basis for imposing Non-Tax State Revenue (PNBP), the authorized collecting agency, tariff classification, and protections for small-scale fishermen.

The legal framework for PNPB treats payments as a consequence of the use of state resources, services, or facilities. Law No. 9 of 2018 on State Non-Tax Revenue reaffirms the principles of governance, accountability, and revenue optimization, as well as the possibility of setting tariffs as low as Rp 0.00 or 0 percent under certain considerations. Regarding public ports, the types and rates of PNPB under the Ministry of Transportation are regulated by Government Regulation No. 15 of 2016, while the types and rates of PNPB for fishing ports under the Ministry of Marine Affairs and Fisheries (KKP) are regulated by Government Regulation No. 85 of 2021. When a fishing vessel is at a public pier, the responsibilities of the two sectoral ministries intersect: the vessel itself falls under the jurisdiction of the KKP, but the facilities and services used are managed by the Ministry of Transportation. This overlap requires an interpretation that goes beyond mere formality and also takes into account the principles of authority, legal certainty, equality of service, and proportionality of the burden.

National literature indicates that the accuracy of Gross Tonnage (GT) directly affects the calculation of PNPB from fishing vessels (Sitepu et al., 2023), while the development of fishing harbors must be tailored to vessel size, berthing capacity, and operational needs (Triyantoro et al., 2021). A study on port governance in Indonesia also points out that regulatory changes do not automatically improve performance if the division of roles among regulators, operators, and service users remains unclear (Sujarwanto, 2016). However, these studies have not specifically explained how PNPB is collected when fishing vessels use public docks, how inter-ministerial coordination functions at the port level, or how administrative discretion is assessed in terms of legality and fairness.

The international literature supports coordination and digitization. Gjerding and Kringelum (2018) explain that port authorities require relational capital — in the form of trust, commitment, and communication — to carry out their systemic functions. Sunitiyoso et al. (2022) identify service procedures, information technology, infrastructure, and human resources as interrelated factors in port performance. Vairetti et al. (2019) demonstrate that

cross-organizational information systems can enhance monitoring, data exchange, and compliance when supported by governance, organizational readiness, and process standards. These findings support coordination between the Port Operating Unit and the Fisheries Harbor Master, as well as the use of e-billing, but do not yet address issues regarding tariff standards and affordability for small-scale fishermen.

Contrary evidence suggests that digitization and harmonization do not always lead to policy improvements. Brunila et al. (2021) identified barriers such as system fragmentation, resource constraints, resistance, and unclear responsibilities. Tilley et al. (2024) demonstrate that real-time tracking of fishing vessels can strengthen collaboration and investment, but leads to only minimal regulatory changes when the legal framework and government capacity remain weak. Nthane et al. (2020) assessed that technology has the potential to strengthen collective action, yet may undermine equity if fishermen are positioned solely as passive data providers. In the Indonesian context, Ford et al. (2026) emphasized that policy changes regarding fishing vessels can lead to unintended consequences due to sectoral fragmentation as well as disparities in capacity and infrastructure across regions.

Given these gaps, this study aims to: (1) explain the basis and process for imposing PNBP on fishing vessels at the Jepara public pier; (2) identify regulatory, administrative, digital, and distributional risk points; and (3) formulate a PNBP governance model that can safeguard state revenue without unlawfully expanding authority or disproportionately burdening small-scale fishermen. The novelty of this research lies in the “facility jurisdiction–proportionality” model, which integrates the determination of authority, tariff classification, data integration, audit trails, service coordination, criteria-based exemptions, and periodic evaluations into a single decision-making process.

METHODS

This study employs a single embedded case study design with a socio-legal approach. A case study was chosen because the research object is a context-bound service mechanism, namely the use of public docks by fishing vessels within the operational area of the Jepara Class II UPP Office. The “embedded” element refers to several units of analysis within the same case: the determination of authority, tariff classification, GT verification, billing, payment, data exchange, and coordination with the issuer of the Letter of Approval to Sail (SPB). The socio-legal approach combines an analysis of the rules that should apply (*das sollen*) with ongoing administrative practices (*das sein*).

The data corpus consists of three groups. First, primary legal materials covering regulations on PNBP, shipping, ports, fisheries, tariff-setting procedures, and the issuance of SPBs. Second, service process documents detailing the recording of vessel arrivals, GT inspections, the issuance of e-bills via MaritimHub, payments, verification, and data exchange. Third, semi-structured interview transcripts and field observations from the main study, covering three stakeholder groups: public port operators/regulators, service providers or fisheries port authorities, and ship owners/operators or fishermen. Informants were selected purposefully based on their formal authority and direct involvement in each stage of the collection process.

The analysis was conducted in five stages. First, each regulation was extracted into a matrix containing the PNBP object, subject, facility manager, tariff unit, authority, and mechanisms for objections or exemptions. Second, the actual workflow was mapped from a vessel’s arrival to the completion of administrative procedures. Third, field data and documents were coded using the Framework Method (Gale et al., 2013) across five initial themes — jurisdiction, tariff classification, collection workflow, data integration, and fairness — with new themes added as they emerged from the data. Fourth, a gap analysis was conducted between regulations and practices, including a search for evidence supporting and undermining

each interpretation. Fifth, policy alternatives were evaluated based on four criteria: legality, administrative feasibility, fiscal effectiveness, and social justice.

Analytical validity is strengthened through source triangulation (documentation, procedural documents, interviews, and observations), actor triangulation, negative case tracing, and an audit trail in the form of a rules–evidence–conclusions matrix. Pro-coordination literature is not used as automatic justification but is compared with counter-arguments to test the limits of the transferability of the concepts of coordination and digitization. This approach prevents the conclusion that increased revenue is always synonymous with good governance or that automated digital systems automatically resolve institutional fragmentation.

The study did not conduct causal estimations or statistical tests because time-series data on PNBP, compliance costs, service times, and fishermen’s income — both before and after the mechanism’s implementation — were unavailable. The main report also did not fully document the final number of informants, interview durations, or verbatim quotes for each actor category. Therefore, the results are interpreted as evidence of institutional processes at a single location, not as a measure of prevalence or a representation of all Indonesian ports. These limitations are offset by the transparency of the analytical trail and the restriction of claims to mechanisms, risks, and policy designs that require further testing.

Table 1. Operational Matrix of the Research Analysis

Dimension	Analytical Questions	Primary Evidence	Evaluation Criteria
Jurisdiction	Who has the authority to collect fees for the use of the facility?	Operator status, type of facility, PNBP regulations	Alignment of authority and service objects
Tariff classification	What rates and units are legally permitted for use?	GT, etmal, type of service, tariff documents	Legal certainty and non-discrimination
Billing process	How are invoices issued and paid?	Arrival records, e-billing, proof of payment	Traceability and efficiency
Data integration	What data is exchanged between agencies?	Vessel identity, GT, ownership, visit history	Accuracy, interoperability, data protection
Fairness	Is the burden commensurate with the services and users’ capabilities?	Operating patterns, weather, scale of operations, relief options	Proportionality and affordability

Source: Author’s analysis, 2026.

RESULTS AND DISCUSSION

1. The Hybrid Nature of the Jepara Public Pier

The Port of Jepara is located on the northern coast of Java and is managed within the jurisdiction of the Jepara Class II Port Management Office. Formally, the public wharf is designated for vessel services and general port activities. In practice, however, the damage to or limitations of the fishing wharf, combined with its proximity to the Fish Landing Site (TPI), has altered usage patterns, leading fishing vessels to use the public wharf for mooring, waiting during operations, and unloading their catch. Although the wharf functions as a hybrid facility operationally, this does not automatically change its institutional status to that of a fishing port.

Key findings indicate that the starting point for determining PNBP is not based on the sectoral identity of the vessel, but rather on state-managed facilities and the specific types of services actually utilized. When fishing vessels use general piers managed by the UPP, a service relationship is established between the general pier operator and the facility user. This interpretation is consistent with the “user pays” principle but must be constrained by the principle of legality: the object, unit, and amount of the levy must still be based on applicable regulations. Thus, the “facility operator” defines the scope of authority but does not have the freedom to create new types of levies or set new rates.

The distinction between facility jurisdiction and vessel regulation is important because it avoids two misconceptions. The first misconception is assuming that fishing vessels are always

subject to fishing port tariffs even when using public port assets and services. The second misconception is assuming that public wharf operators can classify fishing vessels into any tariff group simply because the facility falls under their authority. The research findings support a layered interpretation: authority is determined based on the facility, while tariff classification must be assessed based on the wording regarding the subject matter and vessel categories in the tariff regulations.

2. Collection Process and Administrative Risk Points

The collection process consists of seven stages: recording vessel arrivals, reporting activities, verifying identity and GT, issuing e-bills, payment, verifying proof of payment, and administrative settlement. This structure provides a better transaction trail than manual collection because the invoice amount, payer identity, payment time, and payment status can be traced. GT accuracy is a critical control point because the unit rates for berthing and mooring services are tied to vessel size. Findings by Sitepu et al. (2023) regarding discrepancies between documented GT and measured GT reinforce the need for data validation before invoices are issued.

In the early stages, the UPP faced limitations in its billing instruments because fishing vessel SPBs were issued by the Fisheries Harbor Master. Coordination subsequently led to the practice of using proof of payment for public wharf PNBP as supporting documentation in the departure service process. From a managerial perspective, this practice enhances compliance by linking payment to the service points required by users. Legally, this relationship must be carefully defined. The SPB is fundamentally a safety and seaworthiness instrument; therefore, proof of payment must not supplant safety inspections or constitute an expansion of authority without a clear written basis. A safer option is to exchange status updates on obligations and administrative settlements through joint procedures, accompanied by a dispute resolution channel in the event of billing disputes.

Utilizing a fishermen's group coordinator helps convey policies and facilitate payments when boat owners or fishermen are at sea. This mechanism is effective as a communication bridge, but it creates risks of dependence on intermediaries, information asymmetry, and unclear accountability if the coordinator manages data or payments without a documented mandate. Therefore, the coordinator should act as an information facilitator, while the issuance of invoices, payment authorization, and proof of payment should continue to be carried out directly through official systems accessible to vessel owners.

Table 2. Existing Workflow and Governance Risk Points

Stage	Existing Practices	Added Value	Key Risks	Recommended Controls
1	Arrival recording	Define service objects	Unrecorded or duplicate vessels	Unique visit number and daily reconciliation
2	Activity reporting	Describing the services used	Inconsistent descriptions	Standard forms and staff validation
3	Identity and GT verification	Determining the tariff basis	GT data varies across registries	A single reference data source and correction procedures
4	Issuance of e-billing	Creating an audit trail	Incorrect classification	Multi-layered controls and tariff reason codes
5	Payments	Reducing cash use	Difficulties with digital access	Alternative payment channels and service assistance
6	Verification of payment proof	Ensuring full payment	System status is out of sync	Automatic reconciliation and issue escalation

Stage	Existing Practices	Added Value	Key Risks	Recommended Controls
7	Administrative processing	Inter-process integration	SPB is perceived as a billing tool	Cross-agency SOPs that limit authority

Source: Author's analysis, 2026

Coordination between the UPP, the Fisheries Harbor Master, and user groups aligns with the concept of relational capital in port governance. Gjerding and Kringelum (2018) demonstrate that the systemic functions of port authorities depend on communication, trust, and commitment among stakeholders. In the case of the Jepara public wharf, coordination fills the operational gap that arises because the SPB issuer and the wharf operator belong to different institutions. However, relational capital must be institutionalized through SOPs, data exchange, and the division of responsibilities; reliance on personal relationships makes the mechanism vulnerable to change when officials are replaced.

The findings of Sunitiyoso et al. (2022) support the view that port performance is shaped by the interaction of physical and non-physical infrastructure, including information technology, service procedures, and human capacity. The implementation of e-billing in Jepara has increased transaction transparency, but it is insufficient without a consistent ship registry and staff who understand the basics of classification. In other words, digitization reinforces correct procedures but also accelerates errors if source data or tariff decisions are incorrect.

Vairetti et al. (2019) emphasize that cross-organizational information systems can facilitate monitoring and compliance provided there are process standards, data governance, organizational readiness, and benefits that users understand. The implication for the Jepara Public Port is the need to link data on vessel identity, GT, ownership, port calls, invoices, and payments with clearly defined access rights. Integration does not necessarily mean a single application; rather, what is required is a shared data definition, unique identification numbers, update mechanisms, and auditable reconciliation.

Evidence from Nthane et al. (2020) also demonstrates the potential of technology to strengthen collective action and the position of fishermen when processes are co-designed. In the context of Jepara Public Port, group coordinators can be involved in designing user interfaces, scheduling outreach sessions, establishing support mechanisms, and evaluating complaints. This involvement shifts fishermen from being mere subjects of collection to partners in service design, thereby fostering compliance through understanding and benefits, rather than relying solely on departure controls.

Brunila et al. (2021) found that digital adoption at ports is hindered by legacy systems, limited resources, a lack of standards, unclear data ownership, and organizational resistance. Conditions at Jepara Public Port present risks, such as vessel data being scattered across different agencies, inconsistent connectivity quality and user digital literacy, and some fishermen relying on coordinators. Therefore, success indicators should not stop at the number of e-bills issued but must include billing error rates, correction times, user access, system disruptions, and the number of disputes.

Tilley et al. (2024) demonstrate that real-time fishing vessel tracking systems improve communication and collaboration, but their impact on regulatory development remains limited due to legal barriers and capacity constraints. These findings serve as a reminder that data exchange between the UPP and the fisheries harbor master does not automatically resolve gaps in tariff classification. When tariffs for fishing vessels at public docks have not been explicitly formulated, digital integration merely makes the application of administrative analogies more consistent, not more legitimate.

The use of the People's Shipping (PELRA) tariff as an analogy for fishing vessels can be understood as an effort to identify the category considered closest in size and operational patterns. However, this analogy has normative limitations because fishing vessels and PELRA are distinct categories. Administrative discretion should not create new fee norms or alter the

tariff groups established by regulations. The solution is not to maintain an analogy indefinitely, but rather to document a provisional basis, evaluate the impacts, and propose specific categories or formulas through a legitimate tariff-setting process.

Ford et al. (2026) demonstrate that policies related to Indonesian fishing vessels often produce unintended consequences when sectoral fragmentation, regional capacity disparities, and capital distribution are not taken into account. The imposition of a uniform PNBP may appear neutral, but it has different impacts on large vessels, small vessels, vessels operating year-round, and those idled by weather. Therefore, revenue optimization must be distinguished from revenue maximization. Sustainable revenue requires an accurate database, legally established rates, low compliance costs, and must not encourage avoidance or the relocation of activities to less safe locations.

Nthane et al. (2020) also point out that fishermen may become passive data providers without gaining any increase in bargaining power. This risk arises when data integration is used solely for billing, while users cannot view vessel data, the basis for rates, payment history, or request corrections. A fair model must provide access rights, bill explanations, an appeal mechanism, and data protection. Thus, digitization not only expands the state's capacity to collect fees but also expands citizens' capacity to verify services.

Table 3. Summary of the Pros, Cons, and Limitations of Transferability

Source	Supporting Findings	Limitations/Criticisms	Implications for Jepara
Gjerding & Kringelum (2018)	Relational capital supports the systemic functioning of port authorities	Case study in the context of a more mature port governance system	Coordination needs to be institutionalized, rather than relying on personal relationships
Sunitiyoso et al. (2022)	Procedures, ICT, human resources, and infrastructure mutually influence performance	The systemic model is broad and does not specifically examine PNBP	Evaluations must cover processes, data, and staff capacity
Vairetti et al. (2019)	IOIS strengthens monitoring, data exchange, and compliance	The American/Caribbean Latin context and logistics ports	Adoption requires data governance and shared standards
Brunila et al. (2021)	—	Legacy systems, costs, standards, and resistance hinder digitization	Provide implementation phases, support, and error indicators
Nthane et al. (2020)	ICT co-design can strengthen fishermen's collective action	Fishermen who passively provide data may lose their bargaining power	Provide data access, billing transparency, and appeal channels
Tilley et al. (2024)	Real-time data enhances collaboration and investment	Impact on regulation is limited without a legal framework and capacity	Data integration must be accompanied by harmonization of tariff standards
Ford et al. (2026)	—	Policy changes may create unintended burdens and disparities	Conduct an impact distribution analysis on small-scale fishermen and different regions

Source: Author's synthesis of the reviewed literature, 2026

3. Facility Jurisdiction–Proportionality Model

Based on empirical results and a literature review, this study proposes a facility jurisdiction–proportionality model. This model begins with the question of authority, not revenue targets. The first stage determines who manages the facilities and what services are used. The second stage verifies identity, GT, ownership, and visit history using reconcilable

data. The third stage examines whether tariff categories explicitly cover the objects and subjects; if not, managers should not rely on analogies as a permanent solution.

The fourth stage is e-billing with an audit trail that records the basis for rates, the authorizing officer, corrections, payments, and dispute status. The fifth stage establishes coordination among agencies without blurring their respective functions: payment data can be exchanged to enhance service delivery, but safety decisions within the SPB remain the responsibility of the fisheries harbor master in accordance with their authority. The sixth stage involves a proportionality test for small-scale fishermen, taking into account service usage frequency, lean seasons, inclement weather, business scale, and actual benefits received. Law No. 9 of 2018 on PNBP and Government Regulation No. 69 of 2020 provide for rates as low as Rp 0.00 or 0 percent through a legitimate rate-setting mechanism; this approach is more appropriate than inconsistent local discretion.

The seventh stage involves complaints and periodic evaluations. Fiscal indicators include the number of registered entities, billing accuracy, payments, corrections, and potential revenue leakage. Service indicators include processing time, system disruptions, accessibility of payment channels, and complaint resolution. Equity indicators include the distribution of the tax burden by GT, frequency of visits, business groups, and non-operational conditions. Periodic audits should verify whether revenue increases stem from improved coverage and compliance, rather than from misclassification or excessive burdens.



Figure 1. Facility Jurisdiction–Proportionality Model for the Collection of Non-Tax State Revenue (PNBP) from Fishing Vessels

4. Policy Implications and Testing Agenda

At the port level, the Port Management Unit (UPP) and the Fisheries Harbor Master need to develop joint Standard Operating Procedures (SOPs) that include data definitions, exchange timelines, handling of GT discrepancies, system disruptions, and billing disputes. The SOPs must distinguish between administrative supporting documents and SPB safety requirements and specify the authorized parties to make corrections. Users should receive billing notifications, calculation bases, payment histories, and appeal channels without always having to go through a coordinator.

At the ministerial level, the primary need is to harmonize the categories of fishing vessels using public ports. Policy options may include interpretive clarifications, the addition of special tariff categories, or a formula based on actual services and GT. Each option must be evaluated

through a regulatory impact analysis that compares revenue, administrative costs, ability to pay, the risk of activity displacement, and safety impacts. Exemptions during inclement weather or for specific groups must be established through instruments that are legally valid, measurable, time-limited, and auditable.

At the research level, the model needs to be tested at several ports using a comparative design and quantitative data. Minimum indicators include pre- and post-implementation PNB values, the number of visits, the percentage of registered vessels, GT errors, service time, compliance costs, disputes, and perceptions of fairness. A difference-in-differences design can be used if there are comparison ports and different implementation timeframes. Without such testing, this model constitutes a policy design based on mechanisms and qualitative evidence, rather than evidence of causal effectiveness.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

The imposition of PNB on fishing vessels using Jepara's public docks is, in principle, based on the authority of the facility manager over the facilities and services consumed. However, the authority to manage facilities is not synonymous with the authority to establish tariff classifications. Therefore, the implementation of PNB tariffs at the Ministry of Transportation must be accompanied by explicit testing of the object, subject, unit, and vessel category. The existing mechanism already has a traceable administrative workflow through record-keeping, GT verification, e-billing, payment, and digital verification, supported by coordination between the UPP and the Fisheries Harbor Master.

The main weaknesses lie in overlapping authorities, the PELRA tariff analogy that has not yet been formalized, vessel data that is not yet fully integrated, reliance on coordinators, and the lack of systematic affordability testing. The literature in favor supports coordination and information systems, while the opposing literature indicates that technology does not replace legal clarity, organizational capacity, and user participation. Revenue optimization must therefore be understood as an improvement in coverage, accuracy, compliance, and service quality, not merely an increase in the value of levies.

The novelty of this research lies in the facility-proportionality jurisdictional model, which integrates seven decisions: designation of administrators and services; identity verification (GT); norm-based tariff classification; e-billing with an audit trail; interagency coordination that does not expand authority; proportionality tests and exemption pathways; and complaints and periodic evaluations. The practical implications include the need for interagency SOPs, a reconcilable data registry, formalized tariff classifications, and protection mechanisms for small-scale fishermen.

Limitations

The generalizability of the model remains limited because the study covered only a single port and relied on qualitative evidence; it has not yet measured the causal fiscal or social impacts of the proposed mechanism, nor has it been tested against comparator ports with differing institutional capacities.

Recommendations

Future research should test the facility jurisdiction-proportionality model across multiple ports using a comparative or difference-in-differences design supported by quantitative indicators such as pre- and post-implementation PNB values, registration rates, GT errors, service time, compliance costs, disputes, and perceptions of fairness, so that the mechanism can move from a qualitative policy design toward evidence of causal effectiveness.

Author Contributions

All authors made significant contributions to this study. These contributions included research conceptualization, development of the theoretical framework, data collection, data analysis, interpretation of results, manuscript preparation, scholarly revision, and final approval of the manuscript for publication. All authors confirm that they have read and approved the final version of the article.

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