PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	The conservation–development paradox in Brazilian Amazon extractive reserves: a 35-year systematic review.	
ABSTRACT			
Abstract	2	Reconciling environmental conservation with socioeconomic development remains a fundamental challenge for tropical forest governance. Extractive Reserves (RESEXs) in the Amazon were pioneered 35 years ago as a radical model for socio-environmental synergy; however, their long-term efficacy is increasingly contested. Through a systematic review of three and a half decades of qualitative research, we analyze the performance of the RESEX model in balancing the livelihoods of traditional communities—including extractivists and *quilombolas*—with forest integrity. Our findings reveal a persistent conservation–development decoupling: a high prioritization of ecological preservation coupled with chronic underinvestment in socioeconomic infrastructure. We demonstrate that this imbalance has yielded a 'vulnerability trap,' where stagnant agroextractive initiatives and insufficient technological integration have inadvertently pushed local populations toward predatory land-use alternatives, such as cattle ranching. We conclude that prioritizing forest cover metrics while neglecting the economic agency of traditional populations is an inadequate strategy for the Amazon's future. By situating these findings within the frameworks of Political Ecology and the Governance of the Commons, this study argues for a paradigm shift toward a technologically enabled bioeconomy—a transition essential for the pragmatic success of global climate goals.	
INTRODUCTION			
Rationale	3	The Amazon rainforest is critical for maintaining global biodiversity [1], accounting for an estimated 20% of the world's freshwater reserves [2] and holding half of its tropical carbon stocks [3]. This vast territory is characterized by significant mineral wealth [4], diverse productive activities [5,6], and immense cultural diversity [7], all of which influence regional and global climate dynamics [8]. However, recent decades have witnessed extensive land-use changes [9] driven by the expansion of both agricultural and industrial economic activities [10], including logging, mining [11], and livestock farming, which have accelerated annual deforestation rates [12,13]. These processes trigger ecological and hydrological imbalances, biodiversity loss, and increased forest fire frequency [14]. Given the region's role in mitigating climate change [3], the Brazilian government has implemented interventionist policies to control deforestation [15], most notably the establishment of Conservation Units (CUs). While primarily aimed at ecosystem protection, CUs also promote socioeconomic development, scientific research, and sustainable production by local communities [16]. These areas represent a key strategy for addressing the global biodiversity crisis [17] and achieving the global target of protecting 30% of the planet's natural resources by 2030 [20]. In Brazil, CUs are categorized into two groups—Strict Protection (*Proteção Integral*) and Sustainable Use—managed under the National System of Nature Conservation Units (SNUC, Law No. 9,985/2000). The Sustainable Use group includes Extractive Reserves (RESEX), which aim to conserve natural resources while protecting traditional livelihoods and improving the living conditions of local populations [25]. Local communities within RESEXs rely on agroextractivism, combining plant extraction (Non-Timber Forest Products - NTFPs), subsistence agriculture, and small-scale livestock farming [26,27]. Despite the integration of some technical advancements [28], these activities—including the harvest of Brazil nuts and vegetable oils, as well as small-scale farming and ranching—remain economically marginalized in many RESEXs [29] due to governance gaps and low technological investment [30,31].	
Objectives	4	Our study assesses the progress made in reconciling these two pillars since the inception of the RESEX model, evaluating whether the intended socio-environmental synergy has been effectively realized in practice.	
METHODS			
Eligibility criteria	5	This study encompasses research on political ecology, community-based projects, financial deficits, and public policies regarding socioeconomic investments in terrestrial RESEXs. Studies documenting productive activities, such as the extraction of rubber (Hevea brasiliensis), Brazil nuts (Bertholletia excelsa), and açaí (Euterpe oleracea), were included regardless of geo-graphical restrictions within the biome. Exclusion criteria comprised strictly protected CUs and sustainable use categories other than terrestrial Amazonian RESEXs (e.g., National Forests, Wildlife Refuges, and marine RESEXs). Research focused exclusively on mining, fossil fuels, or legal conflicts was omitted. Grey literature—including theses, dissertations, technical reports, and conference abstracts—was also excluded to maintain peer-reviewed rigor. Duplicate studies were identified using Mendeley. Article classification followed a two-phase process: (1) title and abstract screening and (2) full-text evaluation based on predefined eligibility procedures. Disagreements were resolved through discussion with a lead reviewer.	

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		To mitigate bias, all screening and data extraction stages were conducted by at least two independent reviewers. If a reviewer was an author of a primary study under evaluation, they were recused from that specific process, and a third-party adjudicator resolved any discrepancies.	
Information sources	6	Studies from databases/registers (n = 6,683): Periódicos CAPES (n = 372), ScienceDirect (n = 3,025), Scopus (n = 1,745), Springer (n = 1,184) and Web of Science (n = 357). We searched the databases between 2 August and 20 December 2026. **References** 1. Artaxo, P.; Hansson, H. C.; Machado, L. A. T.; Rizzo, L. V. Tropical forests are crucial in regulating the climate on earth. *PLOS Climate*. *Public Library of Science* **2022**. https://doi.org/10.1371/journal.pclm.0000054 2. Moreira, R. M. Trends and correlation between deforestation and precipitation in the Brazilian Amazon Biome. *Theor. Appl. Climatol.* **2024**, *155* (5), 3683–3692. https://doi.org/10.1007/s00704-024-04838-5 3. Oliveira, M. P. A.; Ferreira, R. L. Extending beyond Individual Caves: a graph theory approach broadening conservation priorities in amazon iron ore caves. *PeerJ* **2024**, *12*. https://doi.org/10.7717/peerj.16877 4. Colman de Azevedo Junior, W.; Rodrigues, M.; Costa Correia Silva, D. Does agricultural efficiency contribute to slowdown of deforestation in the Brazilian Legal Amazon? *J. Nat. Conserv.* **2022**, *65*. https://doi.org/10.1016/j.jnc.2021.126092 5. Irigoin, V.; Pizarro, D.; Fuentes, E.; García, C.; Wattiaux, M.; Picasso, V.; Arango, J.; Romero, G.; Gómez-Bravo, C. Biotechnical, economic, and environmental assessment of dairy systems in the Peruvian Amazon utilizing the cleaned tool. *Agroforestry Systems* **2025**, *99* (2). https://doi.org/10.1007/s10457-024-01099-z 6. Griffiths, B. M.; Dimitrie, D.; Schierbeek, E.; Perez, E. C.; Nirenblatt, E.; Cano, N. A.; Gilmore, M. P. Proposed highway in the Peruvian Amazon threatens vulnerable indigenous communities and natural protected areas. *Ambio*. **2025**, 1103–1108. https://doi.org/10.1007/s13280-025-02175-z 7. Franco, M. A.; Rizzo, L. V.; Teixeira, M. J.; Artaxo, P.; Azevedo, T.; Lelieveld, J.; Nobre, C. A.; Pöhlker, C.; Pöschl, U.; Shimbo, J.; Xu, X.; Machado, L. A. T. How climate change and deforestation interact in the transformation of the Amazon Rainforest. *Nat. Commun.* **2025**, *16* (1), 7944. https://doi.org/10.1038/s41467-025-63156-0 8. Gomes, L. B.; Gonçalves, G. R.; Velazco, S. J. E.; de Moraes, K. F.; Marques Neto, O. P.; Santos, F. da S.; Santos, M. P. D.; Lima, M. G. M. Conservation challenges for Brazilian primates and the role of protected areas in a changing climate. *Sci. Rep.* **2024**, *14* (1). https://doi.org/10.1038/s41598-024-82717-9 9. Ribeiro, J. M. P.; Maculan, G.; de Ávila, B. O.; Morais, V. A.; Hoeckesfeld, L.; Secchi, L.; de Andrade Guerra, J. B. S. O. Deforestation by production displacement: expansion of cropland and cattle ranching on amazon forest. *Environ. Dev. Sustain.* **2025**. https://doi.org/10.1007/s10668-024-05917-3 10. Mmbaga, N. E.; Athumani, P. C. Community perceptions on conservation of mount rungwe Nature Forest Reserve, Tanzania: Opportunities, Threats, and Challenges. *Discover Conservation* **2024**, *1* (1). https://doi.org/10.1007/s44353-024-00019-7 11. Rodrigues, M.; Silva, D. C. C.; da Silva Freitas, J. Two decades of strategies, policies, and market institutions to slowdown deforestation in the Brazilian Legal Amazon. *Reg. Environ. Change* **2025**, *25* (2). https://doi.org/10.1007/s10113-025-02413-w 12. Cardil, A.; De-Miguel, S.; Silva, C. A.; Reich, P. B.; Calkin, D.; Brancalion, P. H. S.; Vibrans, A. C.; Gamarra, J. G. P.; Zhou, M.; Pijanowski, B. C.; Hui, C.; Crowther, T. W.; Hérault, B.; Piotto, D.; Salas-Eljatib, C.; Broadbent, E. N.; Almeyda Zambrano, A. M.; Picard, N.; Aragao, L. E. O. C.;	

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		51. Nobre, D. M.; Alarcon, D. T.; Cinti, A.; Schiavetti, A. governance of the Cassurubá Extractive Reserve, Bahia State, Brazil: an analysis of strengths and weaknesses to inform policy. *Mar. Policy* **2017**, *77*, 44–55. https://doi.org/10.1016/j.marpol.2016.12.008 52. Silva, J. M. C. da; Dias, T. C. A. de C.; Cunha, A. C. da; Cunha, H. F. A. Funding deficits of protected areas in Brazil. *Land use policy* **2021**, *100*. https://doi.org/10.1016/j.landusepol.2020.104926 53. Dal'Asta, A. P.; Farias, W. A. A.; Monteiro, A. M. V.; Amaral, S.; Gontijo, A. B.; Fernandes, D. A.; Escada, M. I. S. Violência, conflitos por terra e a dinâmica da economia agrária na Amazônia Brasileira. *Cad. Saude Publica* **2025**, 41. https://doi.org/10.1590/0102-311xpt064024 54. Gonçalves, C. S.; Pimentel, A. S. M.; Andrade, M. M. N. Assessment of pressure indicators on protected areas in the Amazon Coastal Zone-Pará. *Soc. Nat*. **2025**, 37 (77528). https://doi.org/10.14393/SN-v37-2025-77528x 55. Lopes, R. V. P.; Tejerina-Garro, F. L.; Leite, J. C.; Nascimento, M. H. R.; Nascimento, A. S. do. Assessing the degree of sustainability in extractive reserves in the Amazon Biome using the fuzzy logic tool for decision making. *Sustainability (Switzerland)* **2024**, *16* (8). https://doi.org/10.3390/su16083279 56. Debie, E.; Abro, T. W. Carbon stock dynamics in biosphere reserves and mountainous forest ecosystems. *Trees, Forests and People* **2025**. https://doi.org/10.1016/j.tfp.2025.100789 57. Silva, E. C.; Guerrero-Moreno, M. A.; Oliveira, F. A.; Dias-Silva, K.; Juen, L.; Moura Junior, J. F.; de Carvalho, F. G.; Oliveira-Junior, J. M. B. Socio-environmental conflicts and traditional communities in protected areas: a scientometric analysis. *Journal for Nature Conservation* **2025**. https://doi.org/10.1016/j.jnc.2025.126936 58. Maciel, R. C. G.; Cavalcanti, F. C. da S.; de Souza, E. F.; de Oliveira, O. F.; Cavalcante Filho, P. G. The "Chico Mendes" Extractive Reserve and land governance in the amazon: some lessons from the two last decades. *J. Environ. Manage.* **2018**, *223*, 403–408. https://doi.org/10.1016/j.jenvman.2018.06.064 59. Mathäss, P.; Callo-Concha, D.; Frör, O. Are more roads needed? ntfp extractivism and the infrastructure dilemma in the Southwestern Amazon. *PLOS Sustainability and Transformation* **2025**, *4* (6). https://doi.org/10.1371/journal.pstr.0000175 60. Nascimento, A. S.; da Silva Moraes, L. G.; da Costa Moreira, É. Bioeconomy and climate changes: agro-extractivist cooperatives experiences in the Brazilian Amazon. *Sustainability in Debate* **2024**, *15* (2), 137–152. https://doi.org/10.18472/SustDeb.v15n2.2024.54143 61. Parry, L.; Morello, T. F.; Fraser, J. A.; Guerrero, N.; Lotta, G. S.; Martins, R. C.; Newton, P.; Cardoso, J. C. P.; Souza Santos, A. A.; Torres, M. Forest citizens and people-centered conservation in the Brazilian Amazon. *Conservation Biology* **2025**, *39* (3). https://doi.org/10.1111/cobi.70031 62. Vaccarezza Sevilla, M.; Pedreira Lucchese, G.; Krause, T.; Garcia Alarcon, G. From pastures to plates: the thorny path to achieving deforestation-free cattle from Brazil to European consumers. *Ecological Economics* **2025**, *230*. https://doi.org/10.1016/j.ecolecon.2025.108524	
Search strategy	7	The complete search strategies, including the exact search terms, Boolean operators, date and language filters for all databases and records, are detailed and presented in the PRISMA Flow Diagram (Figure 1).	
Selection process	8	The study selection process was conducted in two stages. In the first stage, five reviewers (Farias Filho, M. C.; Rodrigues, M.; Goes, G.; Homma, A. K. O.; Santos, K. M.) independently screened titles and abstracts. Selected records proceeded to the second stage for full-text review. In both phases, reviewers worked independently and blindly, using the Mendeley reference manager. Discrepancies were resolved through discussion among the reviewers or by consulting a sixth author. The deduplication process was performed within Mendeley.	

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Data collection process	9	Data extraction was performed by two independent reviewers (Rivas, A. A. F.; Maia, R. R. P.) using a standardized extraction form created in Excel/Word/Google Forms. The information collected included: authors, year, country, sample size, intervention, and outcomes. Discrepancies between extractors were resolved through consensus or by a third reviewer. In cases of missing or ambiguous data in the original studies, the study authors were contacted via email for clarification. No automation tools were used for data collection.	
Data items	10a	Outcomes were categorized into two domains: (1) Environmental, defined as conservation, impacts on biological diversity, and political ecology; and (2) Socioeconomic, defined as development, income, and/or improvements in living conditions. All results compatible with these domains were sought in each study. In cases where a study presented multiple metrics for the same outcome, data regarding **long-term impacts** were extracted.	
	10b	In addition to the primary outcomes, characterization variables were extracted: (1) Geographic (Amazon Biome); and (2) Environmental conservation and socioeconomic development (Environmental impacts and socioeconomic intervention).	
Study risk of bias assessment	11	To mitigate risk of bias and counteract potential ceiling effects—often prevalent in studies of local Amazonian populations—we employed a double-blind independent vali-dation protocol. Discrepancies were resolved through a lead-reviewer arbitration process, ensuring that the representativeness of local communities and the robustness of environ-mental datasets remained central to our quality metrics.	
Effect measures	12	Given the qualitative nature of this review and the absence of a meta-analysis, results were not expressed through aggregated effect measures (such as risk ratios or mean differences). Instead, data were synthesized narratively, utilizing the original metrics reported in each scientific study to describe impacts on environmental conservation and socioeconomic development.	
Synthesis methods	13a	To determine eligibility in the syntheses, the studies were grouped according to their thematic nature: (1) environmental conservation (e.g., deforestation, fire outbreaks, and impacts on biological diversity) and (2) socioeconomic development (e.g., deficits, financial investments, income generation, and public policies). The characteristics of each study were entered into an evidence table, comparing the type of intervention performed with the conservation and development of protected areas. Studies addressing both themes simultaneously were included in both analysis categories to allow for an integrated view of the impacts.	
	13b	As the synthesis was qualitative in nature, data preparation consisted of standardizing terminologies and concepts across the studies. Diverse terms for similar outcomes (e.g., deficits, financial investments, income generation, and public policies) were categorized under the common domain of socioeconomic development. Similarly, different nomenclatures for protected areas were grouped into environmental conservation categories. Incomplete textual information was addressed through the direct extraction of relevant citations from the authors to ensure fidelity to the original context, eliminating the need for statistical conversions or quantitative data imputation.	
	13c	The results were presented through evidence synthesis tables, organized by thematic categories (Environmental Conservation and Socioeconomic Development). For each individual study, the following data were tabulated: author, year, geographic location, type of intervention, and the primary qualitative findings.	
	13d	The synthesis of results was conducted using a narrative and thematic approach, as the high degree of heterogeneity in study designs, geographic contexts, and conservation and development metrics precluded the performance of a meta-analysis. Data were synthesized following a content analysis framework, grouping the evidence into categories based on observed environmental and socioeconomic impacts.	
	13e	Heterogeneity among the results was explored through a comparative qualitative subgroup analysis, allowing for the identification of whether variations in socioeconomic and environmental outcomes were related to specific local contexts, differences in implemented policies, or the time scales of the projects. The exploration of divergences focused on understanding the conditions that either favored or limited the success of interventions across different scenarios.	
	13f	The synthesized results were evaluated through a qualitative sensitivity analysis to verify whether the primary conclusions of the review remained consistent after excluding studies with a high risk of bias or limited methodological descriptions. We also assessed whether the identified patterns in the relationship between conservation and development were maintained when comparing long-term studies specifically against recent interventions.	
Reporting bias assessment	14	To assess the risk of reporting bias, two qualitative strategies were adopted: (1) Comparison between methods and results, verifying whether all socioeconomic and environmental outcomes planned in the studies were effectively reported; and (2) Analysis of conflicts of interest, observing	

Section and Topic	Item #	Checklist item	Location where item is reported
		potential conflicts among some of the authors and their respective inclusion or exclusion analyses.	
Certainty assessment	15	The certainty of the evidence for environmental conservation and socioeconomic development outcomes was assessed following the principles: (1) Methodological limitations of the primary studies (based on risk of bias assessment); (2) Coherence of results across the different studies; (3) Adequacy of textual and sample data; and (4) Relevance of the geographic and social context to the review question.	
RESULTS			
Study selection	16a	The search process initially identified 6,683 records across all consulted databases. After removing duplicates, 5,939 titles and abstracts remained for screening. In the first selection stage (title and abstract screening), 5,870 records were excluded for not meeting the eligibility criteria. Of the 69 articles selected for full-text reading, 58 were excluded for specific reasons (e.g., strictly protected areas, environmental protection areas, areas of relevant ecological interest, national forests, wildlife reserves, sustainable development reserves, private natural heritage reserves, biological studies, Marine RESEXs in the Amazon or other biomes, and grey literature such as theses, dissertations, monographs, conference proceedings, NGO technical reports, and government documents). Ultimately, 11 studies met all criteria and were included in the qualitative synthesis of this review. The quantitative details for each stage are presented in the PRISMA Flow Diagram (Figure 1).	
	16b	Of the studies assessed in full-text, 58 articles were excluded for failing to strictly meet the eligibility criteria. These studies focused solely on climate change, carbon emissions, mining and oil, mineral or fossil extraction, legal disputes, or industrial extraction without a demonstrated correlation with environmental conservation and socioeconomic development.	
Study characteristics	17	The 11 studies included in this review cover the period from 2017 to 2025, with a higher concentration of publications in the last decade. Geographically, the research focused predominantly on the Brazilian Amazon Biome. The detailed characteristics of each study—including authorship, study design, biome, and key environmental and socioeconomic variables—are synthesized in Table 1.	
Risk of bias in studies	18	The methodological quality of the 11 included studies was assessed, revealing that the majority (72.73%) presented a low risk of bias, meeting all nine criteria of the assessment tool. One study (9.09%) presented an uncertain risk of bias, while two studies (18.18%) were classified as high risk due to limitations in sampling or data analysis. Despite these variations, the primary conclusions regarding environmental conservation and socioeconomic development in Amazonian RESEX remained consistent across all high-quality strata (Table 3).	
Results of individual studies	19	For each of the 11 included studies, the primary qualitative findings were extracted and synthesized in Table 2. Due to the qualitative nature of the evidence and the absence of a meta-analysis, the results are presented by focusing on the conservation and development dimensions within the RESEX. The precision of the findings was established through a thematic recurrence analysis across the selected studies	
Results of syntheses	20a	The synthesis of the 11 included studies covered several extractive reserves in the Amazon, primarily focusing on fauna and flora conservation and the improvement of local inhabitants' living conditions. Regarding the risk of bias, the synthesis was predominantly based on high-quality methodological evidence, ensuring the robustness of the conclusions concerning the positive impact of community management on environmental conservation. However, findings related to socioeconomic development exhibited greater variability, reflecting the methodological limitations observed in the two studies classified as having a high risk of bias.	
	20b	Due to the methodological heterogeneity and the qualitative nature of the primary data from the 11 included studies, no statistical syntheses or meta-analyses were performed. Instead, a narrative synthesis structured by thematic axes (Environmental Conservation and Socioeconomic Development) was conducted. The results indicate a qualitative convergence, suggesting that community management in Amazonian RESEXs acts as a barrier against deforestation, although the precision regarding household income increases varies according to the specific productive activity.	
	20c	The heterogeneity among the 11 studies stems from contextual factors. For instance, RESEXs characterized by consolidated productive activities and strong community organization presented better socioeconomic and conservation indicators than areas with low social capital or higher deforestation pressure due to road proximity.	
	20d	The sensitivity analysis revealed that the findings are robust. Even when excluding studies with methodological limitations (scores of 5/9 and 6/9 in the bias assessment), the thematic convergence regarding the success of community governance and the maintenance of forest cover within RESEXs remained unchanged (Table 3).	

PRISMA 2020 Checklist

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Reporting biases	21	Reporting bias was mitigated by the inclusion of studies with varied outcomes. However, we recognize the potential for publication bias, where RESEXs experiences characterized by low socioeconomic development indices or high territorial conflicts may be underrepresented in the academic literature compared to successful case studies.	
Certainty of evidence	22	The certainty of evidence was classified as high regarding the effectiveness of RESEX in reducing deforestation, due to the consistency among the nine low-risk studies. For socioeconomic development, confidence was moderate, given the variability in income measurement methods and the influence of seasonal factors reported across the 11 studies.	
DISCUSSION			
Discussion	23a	Overall, while RESEXs successfully fulfill their intended role, they face persistent challenges regarding deforestation reduction. Furthermore, socioeconomic development remains heavily dependent on investments in productive activities—such as extractivism, agriculture, and livestock—as well as government subsidies. In this context, environmental conservation and socioeconomic development have not yet established a symbiotic alliance within the local communities of Amazonian RESEXs.	
	23b	The limitations of the evidence stem from the methodological design of the studies. Most of the works are cross-sectional (Silva et al., 2021; Kröger, 2019), providing only a momentary 'snapshot' of the reality within RESEX. Although time-series analyses (Maciel et al., 2018; Silva Júnior et al., 2023) allow for the observation of trends, there is a clear research gap in studies that simultaneously and deeply integrate environmental and socioeconomic dimensions, particularly in 'multiple-use' areas that face greater external pressures.	
	23c	Regarding the limitations of the review process, we opted to exclude grey literature (government reports, theses, and technical documents, etc.), prioritizing only original articles published in peer-reviewed journals. While this choice ensures the methodological quality of the synthesized evidence, we recognize that recent technical data from environmental agencies or local socio-environmental monitoring may not have been captured, thereby limiting the scope of non-academically published primary data.	
	23d	The implications for policies and practices reveal that the success of RESEXs in the Amazon strictly depends on the integration of environmental conservation and socioeconomic development. The 11 reviewed studies converge on the fact that biodiversity protection is only sustainable in the long term when accompanied by economic viability for local communities. Therefore, public policies must focus not only on environmental enforcement but also on strengthening sustainable productive activities that ensure the stay of extractivists in the forest with social dignity.	
OTHER INFORMATION			
Registration and protocol	24a	This systematic review was not previously registered in any database protocols. However, all search, selection, and data extraction procedures were conducted with rigor and transparency, strictly adhering to the PRISMA 2020 guidelines to ensure the reproducibility of the findings.	
	24b	In accordance with established guidelines, we declare that no independent review protocol was previously published. All eligibility criteria, search strategies, and qualitative analysis procedures are detailed in the Materials and Methods section of this manuscript to ensure transparency and reproducibility of the findings.	
	24c	In accordance with established guidelines, we declare that no independent review protocol was prepared prior to the execution of this study. All methodological procedures, including eligibility criteria and search strategies, were defined internally and are fully detailed in the Materials and Methods section of this manuscript.	
Support	25	This research received no external funding. The authors declare that the study was conducted with their own resources and that no funding agency had a role in the design, data collection, analysis, or interpretation of the results.	
Competing interests	26	The authors disclose that several primary studies included in this review (e.g., Freitas et al., 2017, 2023, 2024) were authored or co-authored by members of the present research team. To ensure analytical objectivity, these authors were strictly recused from the screening, data extraction, and critical appraisal of their own work. All such evaluations were conducted independently by non-affiliated reviewers to preclude any potential conflict of interest in the evidence synthesis.	
Availability of data, code and other materials	27	The data extracted from the 11 included studies are presented within the manuscript. The literature search strings and the data extraction forms are available from the corresponding author upon reasonable request. No specific analytical code was developed for this qualitative synthesis..	



PRISMA 2020 Checklist

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