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Socioeconomic status and barriers to swimming participation among children and adolescents: a systematic literature review

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ABSTRACT

Drowning has been and will continue to be a great source of preventable accidental injuries that people die of and swimming is one among many skills which are strongly linked to the person's level of socioeconomic status. The researchers of this systematic analysis have pooled the most updated pool of the world's knowledge on the topic of how socioeconomic factors influence swimming and water safety programmes for the water plus the reported ways of achieving a better equity. A review based on the methodology laid out by the PRISMA 2020 statement for systematic review and meta-analysis was chosen. In the review a structured Boolean search was used only on studies in the English language in the Scopus database from 2021-2026 period. Initially, 586 records were found and 15 were duplicates (the same paper). After several screening stages (i.e. title and abstract) against the set eligibility criteria, 18 papers were finally chosen for evaluation. Two evaluators independently assessed titles/abstracts and texts, while evaluating the agreement between them by the statistic of Cohen's kappa ($\kappa = 0.91$). The combination of search words employed ("socioeconomic status" OR "socioeconomic status") AND ("swimming" OR "aquatic") AND ("access" OR "participation" OR "barriers") resulted in the Boolean search string. Following the thematic analysis, it was carried out by using the coding method in six-phase inductive of Braun and Clarke. To be sure of coding reliability it was cross-checked between two reviewers. Papers have appeared from different authors of Australia (Australia), US, New Zealand, Israel, Belgium, Japan and Indonesia while study techniques employed include qualitative, quantitative, and mixed methods. The analysis by themes found that socioeconomic status plays a role in one's ability to participate and swim lessons and the two main barriers are cost and the lack of availability. Also, the strategies to achieve equality that are most effective are price discounts, programmes delivered by schools, and programmes that are culturally sensitive. Research findings support the area of aquatic activity as well as equip decision-makers with concrete, equity-targeted ways. The research paper advocates longitudinal research on disadvantaged populations, an intersectional perspective, and establishing benchmarks on the measurement of accessibility.



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Introduction

Sport and recreation have become a part of daily life and they also provide ways for people to become healthier and even live longer. The possibility of using sport and recreational facilities by the different persons regardless

of their status in society may be an issue of social justice rather than an individual choice only. Sport swimming is a kind of athletic discipline that it is almost impossible to talk about its importance in any detail, for it is not only a means of physical exercise but also a life-saving skill if a person gets himself in water and can't swim. However, the engagement both of children and adults in sport as well as exercise activities done as a formal one are significantly affected by the participants' socioeconomic status. Those people who are at disadvantage will participate much less and such pattern has been observed even in workplaces for adults or for young people in schools (Nagata et al., 2025; Ferrari et al).

One major problem in sports is the difference in participation due to socioeconomic situation. Such difference is not only in sports but also in the way resources like buildings, infrastructure, disposable income, hours of free and culture that are available at different levels of society (Stahlmann et al., 2022; Kye et al., 2021). It, therefore, is so essential and a good idea to study swimming-related issues because if you cannot swim it would result in loss of social leisure benefits but also in higher death risk which is preventable. This article concentrates on one specific aspect: the socioeconomic distribution of swimming and its relation to swimming deaths. Swimming competition according to experts is a protective feature in drowning. On the other hand, it turned out from the official swimming lessons that drowning for childhood decreased significantly. However, learning facilities again vary (Santibañez-Gutierrez et al., 2022; Miller et al., 2024). People, who have very limited access or opportunities for swimming, are quite often from the categories of low-income families, ethnic minorities, migrants, and living in remote areas, who, contrary to what might be thought, are the ones most at risk of drowning. It is a situation where those who have the greatest risk in their lives are, paradoxically, helped least by the protective programs, just like the inverse-care relationship. Therefore, swimming should be viewed in connection to a framework which deals with the various factors that shape health as a result of one's social status. We have to understand what those basic factors are that explain this social eco-pattern and how they are turned into barriers, if we want to achieve effective and fair interventions.

There continues to be a steady rise in literature focusing on this subject. These studies on diving and health within their sociocontext are frequently cited for explaining how social risk factors such as vulnerability among people may eventually lead to their drowning. There are also other writers who are involved in discussing sport participation, and they frequently argue that a person's ability to participate in sport is determined by socioeconomic indicators such as their family's income and education, and the quality of their residential environment etc. Recently, even within the aquatics field, research has been emerging on very different topics such as children's swimming skill, the effect of swimming programme initiatives and parent & childcare barrier reports. Studies similar to those on aquatic sports have been talking about physical education and the school-related sports and are exploring how contracting out and other provider models may affect the availability of services and the level of access (Spittle, et al., 2022) besides the longlasting effects of childhood active leisure that have been shown to be beneficial not only during childhood but also later on in the development of the individual, even in adults (Kosak, et al., 2024). However, it still stands that the knowledge in public health, social, and health economics literature is largely limited to particular regions or study methods.

Methodological and policy innovations at this time are most probably going to lead us to greater clarity in this area. For instance, governments all around the world have introduced initiatives on demand side through provision of the swimming lessonvoucher program and on supply side by investing in infrastructure and swimming in schools to increase the numbers or diversity of evaluations of various programs (Catalano & Schrager, 1998; Spittel & Coghill, 2021). Scholarly methods have advanced from merely description of phenomena, and socio-ecological and behavioral theoretical perspectives, and behavioral theory of intended behavior besides intersectional analyses as for immigrant populations have now been applied (Carter & Koch, 2023; Nicklett & et al., 2024). The global health emergency which led to the closure of swimming pools and also labor shortages, has reduced access to this facility to a minimum and simultaneously it has exposed how weak our present provision is for socially deprived to meet their most basic needs even after facing hardship. Hence, these scenarios offer an opening to us now for putting together a mosaic of all that we have so far got and putting it at our disposal.

Our first weakness is that nobody has done any systematic way of crossnational synthesis of swimming activities. Usually, current papers and primary studies focus on one aspect or one research method each, and none of the existing reviews or original works have shown the comprehensive picture of the evidence linking socioeconomic position with access acquiring or getting to drowning swimming ability and risk of drowning (López-Cañada et al., 2021; Lee et al., 2022). In consequence, practitioners lack a consistent evidence base to advise and devise programs that enhance equity, while how much success the interventions of these scenarios can bring and whether their use elsewhere is possible or how much they would cost remains an unknown.

The second level gap in the paper is related to lack of theory and methodology. Most of the works in the given area basically just describe the situations without explaining causes, that's probably why from those works

one cannot tell the reasons behind things. The assessment of socioeconomic status as well as participation varies a lot from one study to another. In addition, almost all the literature is produced in high-income countries where, on the other hand, the burden of underwater drownings is high in low- and middle-income regions.

The research done so far has been on a small number of cases only. Hence, this systematic review will serve as one such solution that will provide the much needed knowledge on drowning prevention, an issue of health and public significance on global level. Very few factors have the feature of easy changeability, such as access to swimming. The interaction of health, education, and sport makes swimming such a major role for them. Therefore, governments are pouring in more funds into the voucher schemes and school programs, etc. Nevertheless, with an accurate understanding of the socioeconomic factors related to the current state, obstacles, and effective ways, there will still be a difficulty for the decision-makers to get the necessary evidence. A publicly available PRISMA 2020 protocol was adopted to ensure that the review fully addressed the most recent work, thus serving as a foundation for future research and assessments. Therefore, this paper will deal mainly with the following two research questions as determinants of socioeconomic structure and position. RQ1: What factors determine whether a person from a particular socioeconomic background becomes an active participant or an excluded one?; The idea is that such an analysis would result in a series of intervention points, which are effective as well as easy to implement; RQ2: What socioeconomic factors and barriers and enablers contribute to a difference in participation in swimming and water-safety activities?; The last question refers to the strategies that are the focus of the study. RQ3: What methods of change have been described in the literature and how successful are they for the disadvantaged groups in terms of access to swimming activities and water safety, respectively? The research method involves a systematic literature review, following the PRISMA Statement, as well as the latest edition (PRISMA 2020). The goal of this review is to systematically analyze the link between a person's socioeconomic background and their participation in activities involving water, their risk of drowning, etc., based on studies from 2021 to 2026, that are indexed in the Scopus database.

Method

A systematic literature review (SLR) was selected as the research design because it offers a transparent, replicable, and rigorous method for identifying, appraising, and synthesizing the dispersed evidence on a defined question, minimizing the selection bias inherent in narrative reviews (Tranfield et al., 2003). The SLR approach is particularly suited to a heterogeneous and interdisciplinary field such as socioeconomic access to swimming, where evidence spans public health, sport sociology, and education. The review adhered to the reporting standards of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) statement (Page et al., 2021), building on the reporting principles established by earlier guidance (Liberati et al., 2009). PRISMA 2020 was adopted to structure the identification, screening, eligibility, and inclusion phases and to ensure that the flow of records through the review was fully documented and auditable.

Prior to constructing the search string, the research questions were decomposed using the PICO framework (Population, Intervention/Interest, Comparison, Outcome) to ensure systematic identification of key search concepts. The Population was defined as individuals and communities across socioeconomic strata, including children, parents and carers, migrants, and disadvantaged groups. The Intervention/Interest was access to and participation in swimming lessons, aquatic activity, and water-safety programmes. The Comparison was made across socioeconomic groups (for example, advantaged versus disadvantaged, or by area-level SES, income, migrant status, or ethnicity), with no comparator applied to qualitative studies. The Outcome comprised participation, enrolment or redemption, accessibility, and equity of coverage. Each PICO element was translated into a cluster of keywords and synonyms, which were then combined into a Boolean search string. The exact Boolean search string executed in Scopus was: TITLE-ABS-KEY (("swimming" OR "swim lesson*" OR "learn to swim" OR "aquatic*" OR "water safety" OR "drowning prevention") AND ("socioeconomic*" OR "socio-economic*" OR "income" OR "deprivation" OR "disadvantage*" OR "equit*" OR "inequalit*" OR "disparit*" OR "social determinant*")) AND ("participation" OR "access*" OR "barrier*" OR "enabler*" OR "enrol*" OR "uptake*")) AND PUBYEAR > 2020 AND PUBYEAR < 2027 AND (LIMIT-TO(DOCTYPE, "ar")) AND (LIMIT-TO(LANGUAGE, "English"))

Truncation (the asterisk wildcard) was applied to capture morphological variants: for example, disadvantage* retrieved "disadvantage," "disadvantaged," and "disadvantages," while aquatic* captured "aquatic" and "aquatics." Field codes restricted retrieval to the TITLE-ABS-KEY fields, so that records were returned only when search terms appeared in the title, abstract, or keywords, thereby improving precision. Limiters were applied for document type (journal articles only), language (English), and publication year (2021–2026); these were selected to prioritise recent, peer-reviewed, full-length empirical evidence consistent with the review's contemporary focus. The string was piloted iteratively: an initial, broader formulation returned an unmanageable volume of tangentially related records (for example, clinical and parasitological studies

mentioning "swimming" incidentally), prompting the addition of the socioeconomic and access concept clusters to sharpen relevance.

Scopus was used as the primary and sole bibliographic database, selected for its broad multidisciplinary coverage of peer-reviewed health, social-science, and sport literature and its structured metadata export, which supports reproducible record counting. The search was executed on 20 January 2026. No supplementary databases or grey-literature sources were searched; this decision is acknowledged as a limitation in Section 5.5. Bibliographic metadata for all retrieved records, including authors, titles, source titles, publication years, digital object identifiers, and abstracts, were exported directly from Scopus and served as the authoritative evidence base for screening and synthesis.

Table 1. Inclusion and Exclusion Criteria

Criterion	Inclusion	Exclusion
Language	English only	Non-English
Document type	Peer-reviewed journal article (empirical or review)	Conference paper, book chapter, editorial, note, protocol-only
Publication period	2021–2026	Before 2021
Subject area	Public health, health promotion, sport sociology, education	Unrelated disciplines (e.g., parasitology, engineering, clinical biomechanics)
Topic/relevance	Directly addresses socioeconomic or structural determinants of swimming or water-safety participation/access	Tangential mention of swimming only; no socioeconomic/access focus
Accessibility	Full text available	Full text not retrievable

Study selection proceeded through the three sequential stages specified by PRISMA 2020. First, duplicate records were identified and removed. Second, titles and abstracts of the remaining records were screened against the eligibility criteria to exclude records that were clearly off-topic, non-empirical, or outside the socioeconomic-access scope. Third, the full texts of the records passing the title/abstract stage were assessed for eligibility, with reasons recorded for each exclusion. Screening was conducted systematically against the predefined criteria in Table 1; where relevance was ambiguous at the abstract stage, records were retained for full-text assessment to minimize premature exclusion. Discrepancies arising during appraisal were resolved through consensus discussion, and the final set of included studies reflects agreement against the eligibility criteria.

Quality appraisal was conducted independently from the PICO-based search formulation. Each included study was assessed using the Mixed Methods Appraisal Tool (MMAT), version 2018 (Hong et al., 2018), selected for its suitability in appraising the heterogeneous study designs anticipated in this literature, which spans qualitative, quantitative descriptive, quantitative non-randomized, and mixed-methods work. For each study, the design category was first classified from the reported methodology, after which the corresponding five-item MMAT checklist was applied, with each criterion scored as Yes (1), Can't tell/Partial (0.5), or No (0). One included record was a narrative review whose design falls outside the MMAT categories; consistent with the tool's scope, this study was appraised using an equivalent Joanna Briggs Institute (JBI) critical-appraisal logic for review-type evidence, and this substitution is noted explicitly in Table 3. Study screening (title/abstract and full-text) was conducted independently by two reviewers, with disagreements resolved through discussion with a third reviewer; inter-rater agreement was calculated using Cohen's kappa ($\kappa = 0.91$)

Table 2. MMAT Scoring Scheme

Response	Score
Yes	1
Can't tell / Partial	0.5
No	0

Studies scoring at or above 60% (three of five criteria met) were retained for synthesis with standard confidence; studies below this threshold were not excluded but were flagged as of lower methodological confidence, and their contribution to synthesis was weighted accordingly (see Section 5.4). No study was excluded from the review on quality score alone, consistent with MMAT developer guidance against using total scores as an exclusion cutoff. Appraisal was informed by the content available in each report; where methodological detail was limited (for example, in short programme reports), criteria were scored conservatively. Quality appraisal was conducted with independent screening and consensus reconciliation of discrepancies; the inter-rater agreement coefficient (Cohen's κ) should be reported by the review team upon

completion of dual appraisal, with values of $\kappa = 0.61$ – 0.80 conventionally interpreted as substantial agreement. The full appraisal is presented in Table 3.

Table 3. Quality Assessment Summary (MMAT 2018)

Author(s), Year	Study Design (MMAT category)	Q1	Q2	Q3	Q4	Q5	Total (/5)	Category
Willcox-Pidgeon et al., 2021	Quantitative descriptive	1	0.5	1	0.5	1	4.0	High
Macy et al., 2024	Quantitative descriptive	1	0.5	1	0.5	1	4.0	High
Agam et al., 2026	Quantitative non-randomised	1	1	0.5	0.5	1	4.0	High
Thibaut et al., 2022	Quantitative non-randomised	1	1	1	0.5	1	4.5	High
Tanaka et al., 2025	Quantitative non-randomised	1	1	0.5	1	1	4.5	High
Ananthapavan et al., 2024	Qualitative	1	1	1	1	1	5.0	High
Safi & Bachynski, 2026	Narrative review (JBI-appraised)	1	0.5	1	0.5	0.5	3.5	Medium
Playter et al., 2024	Mixed methods	0.5	0.5	0.5	0.5	0.5	2.5	Low*
Willcox-Pidgeon et al., 2025	Qualitative	1	1	1	1	1	5.0	High
Jagnoor et al., 2025	Qualitative	1	1	1	0.5	1	4.5	High
Macniven et al., 2025	Quantitative descriptive	1	1	1	1	1	5.0	High
Windle et al., 2026	Qualitative	1	1	1	0.5	1	4.5	High
Hamilton et al., 2026	Quantitative non-randomised	1	1	1	0.5	1	4.5	High
Low et al., 2026	Qualitative	1	0.5	1	1	0.5	4.0	High
Cenderadewi et al., 2025	Qualitative	1	1	1	1	0.5	4.5	High
Wang et al., 2026	Quantitative descriptive (economic)	1	0.5	1	0.5	1	4.0	High
Peden et al., 2025	Quantitative descriptive	1	1	1	0.5	1	4.5	High
Peden et al., 2026	Mixed methods	1	1	0.5	0.5	1	4.0	High

Note: Flagged as lower methodological confidence; retained for synthesis with reduced weighting per Section 5.4. Q1–Q5 correspond to the five design-specific MMAT criteria.

For each study included in the review, a structured extraction form was applied. Captured fields were author(s) and year; study setting, that is, the country; study design; sample or data source; the socioeconomic construct or intervention examined, for example area-level SES, income, migrant status, or voucher subsidy; outcome measures relating to participation, access, or equity; and key findings. Extraction was done directly from the Scopus metadata and the study abstracts. The data that came out of that populated Tables 4 and 5 and also formed the basis for thematic coding.

To characterise the conceptual structure of the corpus, a descriptive keyword co-occurrence analysis was undertaken. Author-supplied keywords were pulled from each included record and normalised for case and minor lexical variation, then their frequencies were aggregated. The resulting distribution fed the thematic-cluster visualisation presented in Figure 4. This bibliometric step was intended to complement the narrative thematic synthesis, not replace it. No dedicated network-mapping software (for example, VOSviewer) was required, since the corpus was modest in size.

Evidence synthesis followed thematic synthesis (Thomas & Harden, 2008), an approach that suits the job of integrating findings across qualitative, quantitative, and mixed-methods studies. Findings and results statements were first coded inductively. Those codes were then grouped into descriptive themes reflecting recurring socioeconomic factors, barriers and enablers, and intervention strategies. Afterwards, the descriptive themes were organised analytically in relation to the three research questions. Validation came through constant comparison across studies, with close attention to agreements, contradictions, and contextual nuances. Quantitative and qualitative evidence were interpreted together, and that combination strengthened the credibility of the synthesis.

The review was conducted and reported in accordance with the PRISMA 2020 checklist and flow-diagram requirements (Page et al., 2021). The flow of records from identification through inclusion is documented in Figure 1, and all reported counts are numerically consistent across the Abstract, Methods, and Results. Reference: Page, M. J., et al. (2021), *BMJ*, 372: n71. <https://doi.org/10.1136/bmj.n71>.

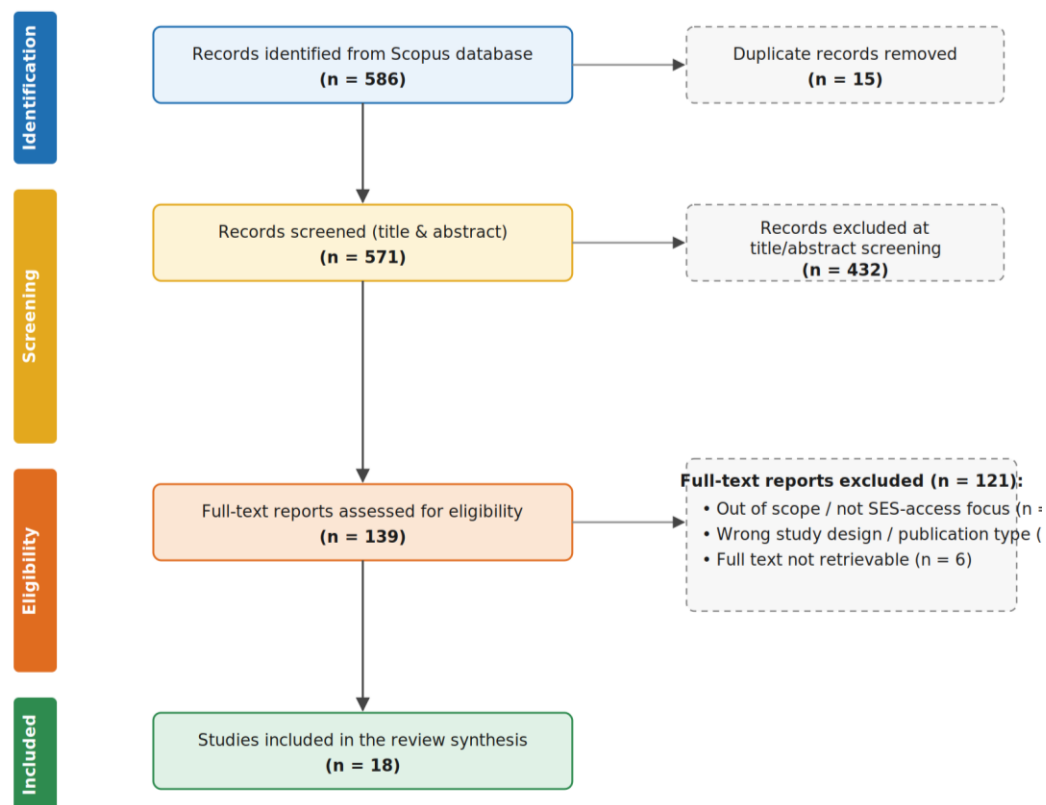


Figure 1. PRISMA 2020 flow diagram of study identification, screening, eligibility, and inclusion. Counts are derived from the Scopus export and screening process. Framework: Page et al. (2021).

Results and Discussions

The Scopus search surfaced 586 records. Deduplication removed 15, leaving 571 that went into title and abstract screening. There, 432 were set aside, all clearly outside the review's socioeconomic-access scope. Think clinical, biomechanical, parasitological, or unrelated sport-science papers that only touched on swimming in passing. That left 139 full texts to assess for eligibility, and 121 did not make it. Of those exclusions, 88 were out of scope or lacked a socioeconomic-access focus, 27 had an ineligible study design or publication type (protocols and purely conceptual pieces included), and 6 could not be obtained as full text. In the end, 18 studies informed the synthesis, as depicted in Figure 1. The same counts appear in the Abstract, Methods, and Results.

The 18 included studies were published between 2021 and 2026, with a clear concentration in the latest years. That pattern reflects how fast evaluation of equity-oriented aquatic programmes has developed. Geographically, the corpus leans heavily on Australian research, with 10 studies, while the United States contributes 3. Single studies come from New Zealand, Israel, Belgium, Japan, and Indonesia. Designs are fairly mixed: qualitative studies lead at six, followed by quantitative descriptive at five, quantitative non-randomised at four, mixed-methods at two, and one narrative review. Full descriptive details are in Table 4, and the thematic-methodological classification sits in Table 5.

Table 4. Summary of Included Studies

Title	Author(s)	Year	Country	Method	Key Findings
Exploring children's participation in commercial swimming lessons through the social determinants of health	Willcox-Pidgeon, Peden & Scarr	2021	Australia	Cross-sectional retrospective analysis	Children from low socioeconomic and regional areas were less likely to achieve the 50 m freestyle benchmark; the cohort was predominantly high-SES and metropolitan, indicating unequal skill attainment tied to social position.

Title	Author(s)	Year	Country	Method	Key Findings
Barriers to Swimming Lessons for Children	Macy, Kendi, Beale-Tawfeeq, Bendelow, Lennon & Heffernan	2024	United States	Cross-sectional survey (descriptive)	Over half of Black and Hispanic/Latine parents reported no child had ever taken swimming lessons, versus under a quarter of White parents; cost, pool access, and COVID-19 closures were prominent barriers.
Preventive infrastructure and childhood health equity in Israel: socioeconomic and ethnic disparities in playground access and swimming instruction	Agam, Barnea & Godler	2026	Israel	Ecological correlational analysis	Only 25% of low-SES and 20.5% of Arab children received swimming instruction versus 60% in affluent, Jewish municipalities; Arab children were 2.43 times more likely to die from drowning, evidencing structural underinvestment. Municipal pool availability and price reductions were not associated with higher swimming participation; women, older, and longer-educated citizens swam less, suggesting facility provision alone is insufficient to widen participation.
Just keep on swimming: the policy effectiveness of building swimming pools	Thibaut, Van Poppel & Scheerder	2022	Belgium	Secondary analysis of participation surveys	Maternal employment and education were key correlates of children's organized-sport participation; swimming participation was higher among children whose mothers held part-time jobs, with patterns varying by gender.
Relationship Between Socioeconomic Status and Organized Sports Among Primary School Children: A Gender-Based Analysis of Sports Participation	Tanaka, Lee & Tanaka	2025	Japan	Cross-sectional questionnaire (logistic regression)	Seven barriers to subsidised swimming-lesson uptake were identified, including affordability, availability, and disability/health needs, disproportionately affecting Aboriginal and Torres Strait Islander, culturally diverse, low-SES, and regional families.
Barriers to preschool aged children's participation in swimming lessons in New South Wales, Australia	Ananthapavan, Peden, Angell & Macniven	2024	Australia	Qualitative thematic analysis	Racial and socioeconomic barriers rooted in historical segregation restrict swimming proficiency among marginalised communities; recommended remedies include school-based instruction, culturally responsive programming, and government vouchers.
Improving accessibility of swimming lessons to reduce childhood drowning rates	Safi & Bachynski	2026	United States	Narrative review	A free, age-appropriate, student-led swim programme for underserved BIPOC and low-SES adolescents (73 participants) improved water-safety knowledge and expanded
Water safe Worcester: student-led drowning prevention in an adolescent underserved population	Playter, Hurley, Lavin-Parsons, Parida, Ballinger, Wong & Valente	2024	United States	Mixed-methods programme evaluation	

Title	Author(s)	Year	Country	Method	Key Findings
Drowning prevention strategies for migrant adults in Australia: a qualitative multiple case study	Willcox-Pidgeon, Franklin & Devine	2025	Australia	Qualitative multiple case study	access, modelling a scalable health-equity intervention. Successful migrant-focused programmes addressed cultural and socioeconomic determinants through single-gender classes, culturally appropriate swimwear, bilingual teachers, and low or no-cost fees, delivering benefits beyond drowning prevention. Most migrants were unaware of water-safety programmes and prioritised income generation over participation; affordable, culturally tailored training delivered in culturally safe settings could enable engagement.
Qualitative exploration of barriers and enablers to migrant access to water safety programmes in Australia	Jagnoor, Scarr & Gupta	2025	Australia	Phenomenological qualitative study	Of 136,299 vouchers created, 77.7% were redeemed; reach and redemption were significantly lower among low-SES, remote, disability, and non-English-speaking groups, with a strong advantage gradient (most vs least advantaged aOR 7.19). Voucher non-redemption arose from seasonal, programme-parameter, parent, and provider factors, including lesson affordability and availability, reflecting the broader socio-ecological context of participation. Socio-structural factors (parent age, sex, income) shaped enrolment intentions indirectly via Theory of Planned Behaviour constructs; income predicted perceived control, with the model explaining 70% of variance in intention.
Population reach and redemption of swimming lesson vouchers for pre-school-aged children in New South Wales, Australia	Macniven, Mead, Angell & Peden	2025	Australia	Programme impact evaluation	Among Indian and Vietnamese adults, differences in access, affordability, and availability of swimming and water-safety education, alongside cultural and family influences, shaped swimming ability and risk perception. Parents and community leaders identified financial constraints, rural inaccessibility, and sociocultural norms as barriers, and community support, supervised childcare, and first-aid
Parent/carer experiences and challenges in redeeming the First Lap swimming lesson voucher in New South Wales, Australia	Windle, Peden, Angell & Macniven	2026	Australia	Qualitative thematic analysis	
Socio-Structural Factors as Predictors of Parents' Intentions to Enrol Their Children in Swimming Lessons	Hamilton, Peden, Smith, Keech, Phipps & Hagger	2026	Australia	Cross-sectional survey (structural equation modelling)	
Exploring the Swimming and Water Safety Behaviour Among Indian and Vietnamese Adults in Australia	Low, Graefe, Willcox-Pidgeon & Barnett	2026	Australia	Qualitative interview study	
Adapting WHO drowning prevention strategies for children in Indonesia: barriers, enablers, and policy perspectives for LMICs	Cenderadewi, Franklin, Fathana & Devine	2025	Indonesia	Qualitative focus-group study	

Title	Author(s)	Year	Country	Method	Key Findings
Evaluating the Economic Impact of Learn-to-Swim Programmes: A Cost-Benefit Analysis of the First Lap Voucher Programme in Australia	Wang, Macniven, Peden & Angell	2026	Australia	Economic evaluation (cost-benefit)	training as enablers; subsidised community programmes were prioritised. The First Lap voucher programme returned AU\$1.40–2.23 per dollar invested, with benefits exceeding costs consistently across all socioeconomic subgroups, supporting subsidised access as cost-effective. Among 256,511 participating children, those in the lowest socioeconomic decile had the highest participation rate, indicating that universal school-based delivery can reduce access inequalities relative to commercial provision. Most swim schools reported increased enrolment (63%) and income (58%) under the voucher programme, with families benefiting from improved affordability and earlier enrolment, evidencing supply-side and demand-side effects.
Water skills for life: assessing population-level coverage of a school-based aquatic program in Aotearoa, New Zealand	Peden, Fozard, Walker, Hone, Hanly & Möller	2025	New Zealand	Programme coverage analysis	
The Views of Swim School Providers on Impacts of a Population-Level Swimming Lesson Voucher Program	Peden, Mead & Macniven	2026	Australia	Mixed-methods survey	

Table 5. Study Classification by Theme and Method

Author(s)	Year	Country	Research Design	Theme/Focus	Intervention/Determinant	Outcome
Willcox-Pidgeon et al.	2021	Australia	Quantitative descriptive	Socioeconomic gradient in skill	Area-level SES; remoteness	Swim-skill benchmark attainment
Macy et al.	2024	United States	Quantitative descriptive	Barriers & disparities	Race/ethnicity; cost; pool access	Lesson participation
Agam et al.	2026	Israel	Quantitative non-randomised	Structural equity	Municipal SES; ethnicity	Instruction access; drowning mortality
Thibaut et al.	2022	Belgium	Quantitative non-randomised	Infrastructure determinants	Facility availability; price	Participation & frequency
Tanaka et al.	2025	Japan	Quantitative non-randomised	Socioeconomic gradient	Maternal education/employment; income	Organized-sport participation
Ananthapavan et al.	2024	Australia	Qualitative	Barriers & enablers	Voucher subsidy; priority populations	Lesson uptake
Safi & Bachynski	2026	United States	Narrative review	Equity intervention strategies	Segregation legacy; policy options	Accessibility of instruction
Playter et al.	2024	United States	Mixed methods	Equity intervention	Free student-led programme	Access; water-safety knowledge
Willcox-Pidgeon et al.	2025	Australia	Qualitative	Equity intervention (migrants)	Culturally tailored programmes	Participation; wellbeing
Jagnoor et al.	2025	Australia	Qualitative	Barriers & enablers (migrants)	Awareness; affordability; culture	Programme access

Author(s)	Year	Country	Research Design	Theme/Focus	Intervention/Determinant	Outcome
Macniven et al.	2025	Australia	Quantitative descriptive	Equity intervention (voucher reach)	Universal voucher subsidy	Voucher reach & redemption
Windle et al.	2026	Australia	Qualitative	Barriers & enablers	Voucher non-redemption factors	Lesson participation
Hamilton et al.	2026	Australia	Quantitative non-randomised	Behavioural determinants	Socio-structural factors; TPB	Enrolment intention
Low et al.	2026	Australia	Qualitative	Barriers & enablers (migrants)	Access; affordability; culture	Swimming ability; risk perception
Cenderadewi et al.	2025	Indonesia	Qualitative	Barriers & enablers (LMIC)	Financial; rural; sociocultural	Prevention-strategy adaptation
Wang et al.	2026	Australia	Quantitative descriptive (economic)	Equity intervention (economics)	Voucher subsidy	Cost-benefit across SES groups
Peden et al.	2025	New Zealand	Quantitative descriptive	Equity intervention (school-based)	National school aquatic programme	Coverage by SES decile
Peden et al.	2026	Australia	Mixed methods	Equity intervention (provider view)	Voucher subsidy	Enrolment; provider impact

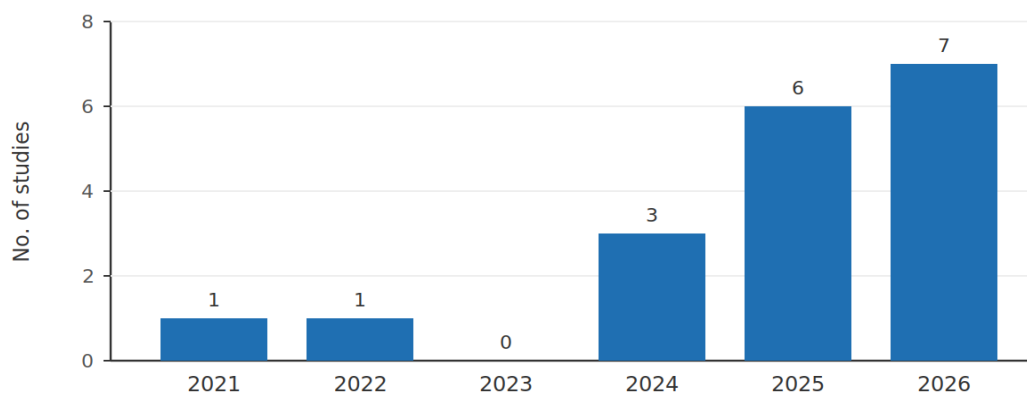


Figure 2. Annual distribution of the 18 included studies, showing accelerating research output on socioeconomic access to swimming, concentrated in 2024–2026.

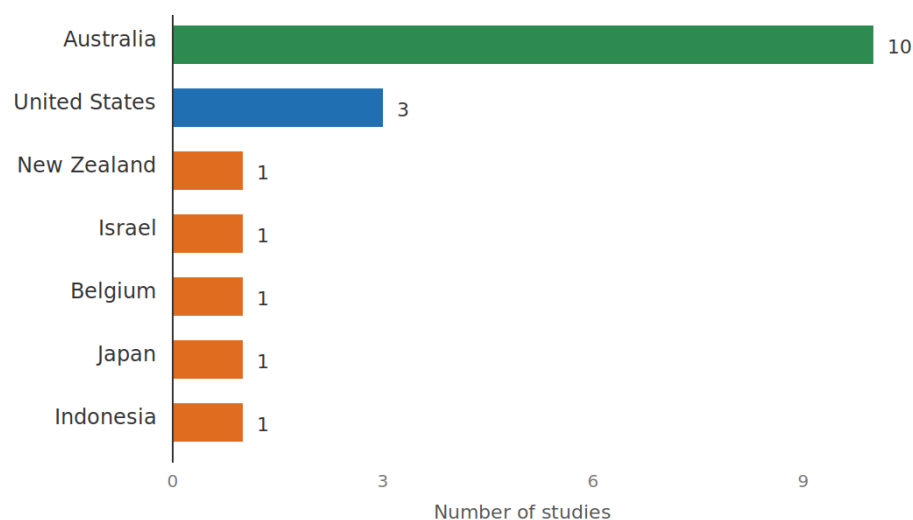


Figure 3. Distribution of included studies by research setting. Evidence is concentrated in high-income Anglophone contexts, with a single low- and middle-income country (Indonesia) represented.

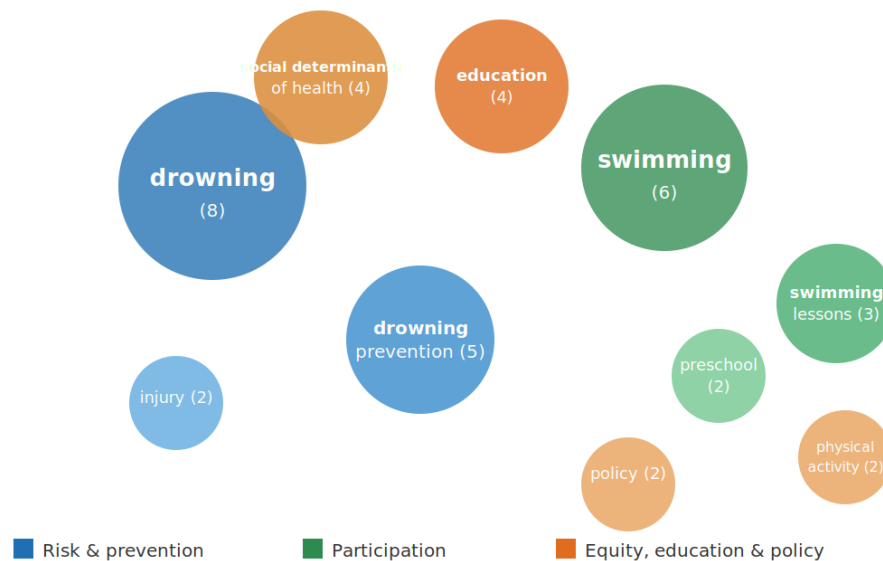


Figure 4. Author-keyword co-occurrence in the included corpus (bubble size proportional to frequency), showing three conceptual clusters: risk and prevention, participation, and equity/education/policy.

This pattern shows up over and over across the corpus. Swimming participation tracks a clear socioeconomic gradient, and three factors dominate: area-level disadvantage, household income, and parental education. Australian data shows children from low socioeconomic and regional areas were markedly less likely to hit national swim-skill benchmarks, while commercial lesson cohorts skewed heavily toward affluent, metropolitan families (Willcox-Pidgeon et al., 2021). Israel offered unusually precise ecological evidence. Only a quarter of children from the lowest socioeconomic clusters received swimming instruction, compared with 60% in affluent municipalities, and that instructional gap coincided with drowning mortality more than twice as high among the disadvantaged group (Agam et al., 2026). Socioeconomic status, in other words, is not a peripheral correlate. It structures both opportunity and outcome.

Income alone does not tell the full story. The studies stress that the composition of disadvantage matters, with ethnicity, migrant status, and parental characteristics working as intersecting factors. In the United States, racial and economic segregation produced pronounced intergenerational gaps in lesson participation; most Black and Hispanic/Latine parents reported no history of lessons within their households (Macy et al., 2024). The picture in Japan was different but related. Maternal employment and educational attainment predicted whether children took part in organized sport, swimming included, which suggests household-level social capital shapes access even where provision is meant to be universal (Tanaka et al., 2025). One behavioural study added a mechanism. Socio-structural factors influenced parents' enrolment intentions indirectly, with income predicting perceived behavioural control within a Theory of Planned Behaviour model that explained a substantial share of intention variance (Hamilton et al., 2026). Socioeconomic position thus works through material and psychological pathways at the same time.

A further point from the corpus is that these effects are context-dependent. They cannot be reduced to whether a facility happens to exist. Take Belgium. A municipal pool's presence, even with price reductions, showed no association with higher participation, pointing to deeper social and cultural barriers among groups like women and older adults (Thibaut et al., 2022). New Zealand offered a striking counterexample. A universal, school-based programme saw its highest participation among children from the lowest socioeconomic decile, implying the delivery model can invert the usual gradient when access no longer depends on household resources (Peden et al., 2025). Across this evidence, RQ1 largely resolves like this: socioeconomic status shapes participation through income, education, ethnicity, and geography, but how and where opportunities are provided mediates the effect.

When participants were asked directly what stood in the way, affordability and availability came up most often, across all settings and study designs. A thematic analysis in New South Wales, drawing on more than four thousand parent and carer responses, identified seven barriers to uptake of subsidised lessons. Cost, limited lesson availability, and scheduling inflexibility featured prominently, and these barriers fell hardest on Aboriginal and Torres Strait Islander, culturally and linguistically diverse, low-income, and regional families (Ananthapavan et al., 2024). Even with a subsidy in place, the qualitative record on voucher non-redemption tells the same story. Affordability concerns persisted right alongside provider-side and logistical constraints,

meaning a single financial instrument cannot neutralise the full barrier structure on its own (Windle et al., 2026). The convergent message is that socioeconomic barriers are layered, not singular.

Migrant and minority populations surfaced a distinctive cluster of barriers, rooted less in price and more in awareness, culture, and competing priorities. Recent migrants in Australia often had no idea that water-safety programmes existed, and they prioritised income generation over participation; structural invisibility compounded material constraint (Jagnoor et al., 2025). Work with Indian and Vietnamese adults located barriers in the interaction between access, affordability, and availability and cultural or familial influences on risk perception (Low et al., 2026). In a low- and middle-income setting, Indonesian parents and community leaders named financial constraints, rural inaccessibility, and sociocultural norms as the principal obstacles (Cenderadewi et al., 2025). Across all these groups, the barrier profile runs beyond price. Information, cultural safety, and geography matter just as much.

The same studies also identified a coherent set of enablers, and most of them come down to tailoring provision to the socioeconomic and cultural realities of under-served groups. Migrant-focused programmes worked when they built in single-gender classes, culturally appropriate swimwear, bilingual instructors, and low or no-cost participation, turning acknowledged barriers into designed-in supports (Willcox-Pidgeon et al., 2025). In the LMIC context, the reported enablers centred on community support, supervised childcare, and locally embedded first-aid training (Cenderadewi et al., 2025). Behavioural evidence then pointed to supportive social norms and parental confidence as levers for more equitable enrolment (Hamilton et al., 2026). So the RQ2 synthesis is almost symmetrical. Barriers and enablers mirror each other: the very features that exclude disadvantaged groups become, once deliberately addressed, the mechanisms of inclusion.

The most extensively evaluated equity strategy was a demand-side one, principally swimming-lesson vouchers, and the evidence on them is nuanced. In a large impact evaluation, a universal voucher reached and was redeemed by a substantial proportion of eligible children. Yet reach and redemption ran significantly lower among low-socioeconomic, remote, disability, and non-English-speaking groups, a reminder that universal instruments can reproduce the very gradients they set out to close (Macniven et al., 2025). Complementary economic analysis still found the same programme cost-effective, returning well above one dollar of benefit for every dollar invested across all socioeconomic subgroups (Wang et al., 2026). Provider-side evidence added that enrolments increased and family affordability improved (Peden et al., 2026). Vouchers come across as beneficial and efficient, but insufficient on their own. Equitable uptake still needs targeted outreach.

Demand subsidies can only achieve so much. Supply-side and universal-delivery strategies offered a partial corrective, and the New Zealand school-based programme is the clearest instance. Participation there peaked among the most disadvantaged decile, precisely because channelling instruction through schools removed the household-level access hurdle (Peden et al., 2025). A narrative synthesis of the United States context reached a compatible conclusion, attributing persistent inequities to the absence of a nationwide, school-embedded swim-instruction strategy and recommending that swim education be folded into physical-education requirements alongside culturally responsive programming and vouchers (Safi & Bachynski, 2026). What these findings add up to is that universal institutions can reach groups that market-based, and even subsidised commercial, provision systematically misses.

A third strategic strand ran through the literature, this one focused on community-based and co-designed interventions tailored to specific populations. Take the free, student-led programme for underserved adolescents. It showed that partnership models can bring age-appropriate, no-cost instruction to BIPOC and low-income youth who fall outside child-oriented provision (Playter et al., 2024). Migrant-focused case studies pointed the same way, with programmes intentionally built around cultural and socioeconomic determinants delivering benefits that went beyond drowning prevention, such as social connection and settlement (Willcox-Pidgeon et al., 2025). The LMIC evidence, for its part, prioritised subsidised, community-embedded programmes and cross-sector coordination (Cenderadewi et al., 2025). Taken together, the RQ3 synthesis indicates that no single instrument is sufficient. Equitable access appears to require layered strategies combining subsidy, universal institutional delivery, and culturally responsive community design.

Methodologically, the corpus leans heavily toward qualitative and quantitative descriptive designs. Qualitative thematic analyses and programme evaluations predominate, and no randomised or longitudinal experimental studies appear anywhere in the set. That distribution says something about where this field currently sits. It is strong on describing barriers and characterising programme reach, but thin when it comes to establishing causal effects of interventions on participation or, ultimately, on drowning outcomes. The quantitative evidence that exists is largely cross-sectional or ecological, the Israeli correlational analysis being one example (Agam et al., 2026) and the Japanese and Belgian survey studies another (Tanaka et al., 2025; Thibaut et al., 2022). Inference about the direction and magnitude of socioeconomic effects is therefore limited.

Still, a discernible methodological evolution is visible across the 2021, 2026 window. Earlier work tended toward descriptive skill and participation profiling (Willcox-Pidgeon et al., 2021). More recent studies increasingly fold in behavioural theory and economic evaluation, whether through the structural-equation modelling of enrolment intentions (Hamilton et al., 2026) or the cost, benefit analysis of voucher provision (Wang et al., 2026). The rise of intersectional and migrant-focused qualitative work (Jagnoor et al., 2025; Low et al., 2026) signals a further shift, from treating disadvantaged populations as homogeneous to disaggregating their circumstances. Some designs remain underused, notably mixed-methods evaluations with comparison groups and any prospective follow-up of participation. The single narrative review in the corpus (Safi & Bachynski, 2026), appraised here with lower confidence, also underlines the absence of prior systematic synthesis, exactly the gap this review addresses. The overall methodological picture is of a maturing but still predominantly observational field.

Interpretation of findings. The synthesised evidence suggests that swimming participation is socially patterned, with socioeconomic position operating as an upstream determinant of both opportunity and risk. The recurring gradient keeps taking the same shape: advantaged children acquire competence while disadvantaged children remain under-served and over-exposed to drowning. That is best understood as the inverse relationship between need and provision made manifest, not as a set of isolated individual choices. Facility availability alone did not raise participation in Belgium (Thibaut et al., 2022), whereas universal school-based delivery lifted participation among the most disadvantaged in New Zealand (Peden et al., 2025). The causal lever, in other words, is the social organisation of access, not the physical existence of pools.

Theoretical implications. These findings extend the social-determinants-of-health framework into the aquatic domain while demonstrating its compatibility with individual-level behavioural theory. Consider the evidence that income shaped enrolment intention indirectly through perceived control (Hamilton et al., 2026). It knits structural and psychological accounts together, echoing calls in the wider physical-activity literature to embed socioeconomic determinants within social-cognition models (Ajzen, 1991; Nicklett et al., 2024). The corpus thereby supports a layered theorisation in which macro-level distribution of resources conditions the micro-level beliefs and capabilities that drive participation. That framing is consistent with socio-ecological analyses of sport participation among marginalised groups (López-Cañada et al., 2021).

Practical implications. For policymakers and practitioners, the most actionable takeaway is that equitable access calls for bundled interventions rather than single ones. Vouchers improve affordability and appear cost-effective (Wang et al., 2026; Peden et al., 2026), yet without targeted outreach they under-reach priority groups (Macniven et al., 2025). Universal school-based provision reaches disadvantaged children more reliably (Peden et al., 2025), and culturally responsive community design is necessary to engage migrant and minority populations (Willcox-Pidgeon et al., 2025; Jagnoor et al., 2025). Coaches, aquatic providers, schools, and local governments should therefore coordinate demand-side subsidy, universal institutional delivery, and tailored community programmes. This approach aligns with World Health Organization guidance that positions learn-to-swim provision as a core drowning-prevention strategy (World Health Organization, 2014).

Comparison with prior reviews. The corpus contains only one review-type study, and it drew on the United States experience to argue that the absence of a national school-based strategy sustains racial and socioeconomic inequities (Safi & Bachynski, 2026). The present systematic synthesis both corroborates and internationalises that argument. Convergent patterns appear across seven countries, and school-based delivery emerges as an empirically supported corrective (Peden et al., 2025). Relative to the broader literature on socioeconomic inequality in physical activity and sport (Nagata et al., 2025; Ferrari et al., 2021; Stahlmann et al., 2022), this review contributes a domain-specific account that links participation inequity directly to a mortality outcome, a connection less prominent in general sport-participation reviews. Contradictions in the literature. A few tensions warrant attention. Universal instruments produced opposite equity signatures depending on how they were delivered. A universal voucher.

Conclusions

This systemic review summarized recent international investigations into how socioeconomic status and access to aquatic activities intertwine. It showed that income levels, area of residence disadvantage, the education levels of parents, ethnicity, status as an immigrant, and being in rural areas are the constant factors in determining swimming skills. Limited affordability, few facilities available, low awareness of the existence of swim facilities, and cultural mismatch were identified as major obstacles that could be eased through subsidies, comprehensive swimming programmes in schools, and community programs which respect different cultures. The paper's main finding was that in seven countries the socioeconomic determinants, lived barriers, and enablers have been linked with interventions to enhance people's access to swim. This finding supports the

expansion of the social determinants of health theories into the water sports field. The paper informs the policymakers and aquatic sport professionals that equity in access is achieved by combining various ways to solve the problem rather than one single solution. The paper has two limitations: it has used only one-database, it includes papers that are in the English language only, and is mainly based on the observational evidence. The priority in future research should include controlled and longitudinal study methods, low and middle-income settings, and standardized, intersectional measures of access and participation.

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