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Negative prior aquatic experiences and children's aquatic competency: Do parent perceptions differ from reality?

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Abstract

Issue Addressed: Achieving aquatic competence is recommended for preventing childhood drownings, yet many children in Victoria, Australia do not meet aquatic benchmarks despite participating in swimming and water safety programs. While few studies have explored factors influencing aquatic competency development, negative prior aquatic experiences (NPAE) have surfaced as a potential influence. Research on children's NPAE has primarily focused on parental perceptions rather than the child's actual experiences.

Methods: Parents and children (aged 10–12 years) completed reliable surveys for background information and NPAE-related data. Children also completed aquatic competency assessments against benchmark standards. Chi-square tests determined relationships between NPAE and aquatic competency, and thematic analysis categorised themes related to perceptions of the child's NPAE.

Results: Most parents (82.9%) indicated their child had not had NPAE, while only half (51.0%) of children did not report NPAE. Children reporting NPAE often perceived incidents as nearly drowning (41%), encompassing swimming pool environments and underwater submersion. Similarly, parents reported varied situations, noting NPAE involving open water and the child's loss of control. Parent-reported NPAE was associated with children less likely to achieve knowledge, continuous swimming, and survival competency benchmarks ($p < .05$). Children reporting NPAE were less likely to achieve underwater competencies ($p < .05$).

Conclusions: The disparity between parent and child perspectives of NPAE demonstrates the importance of considering both perspectives. This should assist in providing appropriate support for children to develop aquatic competencies.

So What? Using NPAE data, practitioners can customise swim teaching approaches to address and prevent NPAE, particularly as many children associate their NPAE with pools, the common setting for aquatic education.

KEYWORDS

aquatic activity, drowning prevention, swimming ability, swimming lessons, teaching

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1 | INTRODUCTION

Drowning is one of the leading causes of mortality among individuals aged 0–24 years in the Western Pacific Region and in High Income Countries.¹ In Australia, an average of 67 unintentional fatal drownings occur annually among young people aged 0–24 years.² While prevention requires a multifaceted approach, one of the strategies recommended by the World Health Organization¹ is the teaching of swimming, water safety, and rescue skills to school-aged children. Commencing in 2017, swimming and water safety education became part of the primary school curriculum in Victoria, Australia. Numerous Victorian primary schools continue to receive financial support to deliver essential swimming and water safety lessons to students,³ and various providers actively guide children toward the achievement of the Victorian Water Safety Certificate (VWSC).

Established by the Victorian government to align with national swimming and water safety benchmarks, the VWSC encompasses specific competencies related to swimming ability, rescue and lifesaving, and knowledge.⁴ Victorian primary-school-aged children are expected to achieve the certificate before completing their primary education.⁴ Research indicates, however, that many children graduate from primary school without demonstrating these fundamental aquatic competencies.^{5,6} While more recent research on the swimming ability of primary students is not available, the closure of schools and aquatic facilities during the COVID-19 pandemic is anticipated to have worsened the existing issue.⁷ Additionally, the repercussions of the pandemic have led to many swim schools currently operating at full capacity, hindering children's access to aquatic education.⁷ This is of concern, particularly with the substantial increase in drowning deaths among 0–14 year-olds during the pandemic period (2020/2021), notably in Victoria, where a fourfold rise was observed compared to the decade average of fatal drownings for this age group.⁸

In examining factors that may influence a child's proficiency in swimming and water safety, a recent systematic review identified 18 demographic and background factors.⁹ These factors were measured against children's aquatic competency and demonstrated varied effects on their swimming and water safety skills and/or knowledge.⁹ Among the factors identified were age, socio-economic status, school type (private, public or Catholic), having negative prior-aquatic experiences (NPAAE), disability and/or medical conditions, and the frequency of participation in aquatic activities. The evidence supporting each factor varied, with research indicating that children without NPAAE tending to exhibit greater aquatic competence than those with such experiences.^{10,11} However, the review highlighted a lack of conclusive evidence regarding the overall impact of NPAAE, particularly the specific types of experiences that influence children's aquatic competence development.⁹

In prior research examining the impact of NPAAE on children's aquatic competence development, the focus has involved parental reports of their child's NPAAE. Common themes within these parental reports included negative experiences during swimming lessons or at a beach, instances where the child fell into water, and

experiences of non-fatal drowning.¹¹ This novel research highlighted swimming lessons as a primary context for such experiences and emphasised the responsibility of swimming lesson providers in managing and preventing such experiences to avoid lasting effects on the child. Existing research has demonstrated that negative experiences in school physical education and sports can adversely impact on physical activity participation as an adult.¹² Accordingly, further investigation into NPAAE among children is crucial for effective prevention and treatment, aiming to mitigate potential lifelong effects such as disengagement from aquatic education and subsequent consequences of this.

In attempting to broaden the scope of evidence regarding the influence of NPAAE on children, considering the perspectives of children themselves is needed. A systematic review addressing parent-child agreement on the child's health-related matters when the child had physical or psychosocial issues, found most included studies reported moderate or poor agreement between parents and children.¹³ Hemmingsson et al.¹³ noted greater concordance between the two perspectives when health symptoms were external or observable, rather than internal or non-observable, such as emotions. Interestingly, parents often reported more significant issues than the children, however, emotional functioning was identified as an area underreported by parents in comparison to children's responses. Similar disparities between parent and child reports have been noted in various health-related contexts, including the level of child disability¹⁴; the child's physical health-related quality of life¹⁵; child's psychopathology¹⁶; and child's depression symptoms.¹⁷ This body of research demonstrates the importance of incorporating multiple perspectives in understanding child health, recognising that parents and children may draw on different information, experiences and perspectives to inform their responses,^{13,18,19} all of which should be considered in determining child requirements.

Therefore, the objective of this research was to understand the perspective of both parents and children regarding the child's NPAAE and examine the impact of a reported NPAAE on the child's aquatic competence.

2 | METHODS

2.1 | Design

In this observational cohort study, we conducted surveys with children and their parents to collect demographic information about the children, their aquatic experiences and their knowledge. Subsequently, we administered practical assessments to evaluate the child's swimming and water safety competencies and knowledge.

Ethics approval was granted prior to data collection, by the University Human Research Ethics Committee at Federation University Australia (project approval number A22-099), and the Research Committees at the Victorian Government Department for Education and, the Ballarat, Melbourne, and Sale Archdioceses for Catholic Schools in Victoria.

2.2 | Recruitment and participants

This research was promoted through statewide newsletters to schools, which encouraged Principals to establish contact with the research team for potential participation. Convenience sampling also occurred, leveraging the researchers' educational connections to recruit Principals and schools.

Informed consent was received from school Principals before the school disseminated information about the research to the parents of Year 5 and 6 children (aged 10–12 years). Parents provided their informed consent for their child to participate in this project and completed a parent survey. To incentivise parent survey completion, a \$20 shopping voucher was offered. Upon receiving parental consent, schools allocated class time for children to provide their informed consent and complete the child survey.

2.3 | Measures

Two surveys were developed and validated by a panel of experts using the Delphi method: one for parents of participating children and one for the children themselves. Both surveys could be completed online or in paper format and typically took between 10 and 15 minutes to complete. Detailed information regarding the validation process is reported elsewhere and followed a similar process as described in previous research (e.g.,^{20,21}).

Both surveys were designed to gather demographic and background information from both parents and children, which have been identified in prior research to impact the aquatic competence of children.⁹ These factors include NPAE as explored in studies by Franklin et al.¹⁰ and Peden and Franklin.¹¹ All questions were optional to complete due to the sensitive nature of some personal information. Participants were provided information in all plain language statements prior to consenting to participate that all responses would remain confidential and only named researchers would have full access to the dataset.

Both surveys included a common question asking whether the child had NPAE, either from the parent's perspective or the child's own experiences. The initial question presented a forced dichotomous choice: "Has your child/Have you ever had a bad experience in, on, or around the water?" with an example provided, such as "A bad experience may include feeling uncomfortable or unwelcome, feeling scared or frightened when in the water, falling into the water, or nearly drowning". This example was derived from previous research on NPAE among children.¹¹ If the parent or child answered 'yes' to this question, they were then asked a subsequent multiple-choice question, with an optional open text component, to provide further qualitative details about this NPAE. The response options for this question were informed by prior research¹¹ and included "Feeling uncomfortable or unwelcome; Feeling scared or frightened when in the water; Falling into the water; Nearly drowning; Other, please describe". To protect the well-being of parents and children completing these questions, all participants were briefed on the nature of the questions

TABLE 1 Victorian Water Safety Certificate assessment criteria.

Measure	Assessment
Water safety knowledge	Answer pre-determined questions relating to water safety in different aquatic environments and locations
Swimming	Swim for a continuous distance of 50 metres (includes 25 metres of freestyle and 25 metres of one other stroke, demonstrating sound breathing and stroke technique)
Underwater	Surface dive, swim underwater and search to recover an object from deep water
Lifesaving	Respond to an emergency by demonstrating DRSAB (Danger, Response, Send for help, Airways, Breathing) and the recovery position
Continuous survival sequence	Dressed in a t-shirt & shorts, students need to: <ol style="list-style-type: none"> 1. Enter the water safely 2. Float, scull and tread water for 2 min (signalling for help intermittently) 3. Swim survival strokes for 3 min 4. Exit the water safely
Rescue	<ol style="list-style-type: none"> 1. Reach rescue using a non-rigid aid 2. Throw rescue using a weighted rope 3. Throw rescue using a buoyant object and unweighted rope

within the plain language information statement prior to consenting to participate in the study. Additionally, contact details of counselling and helpline services were also provided in the plain language statement.

Following completion of the surveys but before commencing their school swimming pool program, the children were assessed against the VWSC competencies. These competencies represent the standard benchmarks for swimming and water safety for children at the end of primary school in Victoria. Trained swimming teachers conducted these assessments, using the established assessment guidelines for evaluating VWSC competencies (Table 1).

2.4 | Data analysis

Qualitative and quantitative data were collected from the surveys completed by children and parents, as well as the pre-program assessments of the VWSC. These results were collated in a Microsoft Excel spreadsheet before quantitative data was imported into SPSS software for analysis, and qualitative data (i.e., NPAE responses) were extracted for thematic analysis. Competency assessments were matched with survey responses by the lead researcher using the child's name, which was subsequently removed before data analysis commenced.

Descriptive statistics (mean [SD], frequencies, and/or percentages) were calculated for all variables. Regarding the VWSC assessments, children were categorised as either "achieved" or "did not achieve" for each VWSC competency. To be considered to have achieved the VWSC, a child needed to demonstrate all

TABLE 2 Participant demographics.

Demographic variable	Response options	Percentage of participants (n)	Parent reported “yes” to child NPAE
Child gender	Male	43% (91)	14% (13)
	Female	55% (117)	10% (11)
	Prefer not to say	2% (6)	
Child age (years)	10	33% (70)	16% (11)
	11	53% (112)	10% (11)
	12	13% (28)	8% (2)
Child undertaken private swimming lessons	Yes	79% (163)	10% (17)
	No	21% (44)	17% (7)
Frequency of child visiting open aquatic locations (e.g. beaches, rivers, lakes)	Once a week	12% (24)	4% (1)
	Once or twice a month	42% (84)	13% (11)
	Rarely	46% (93)	12% (11)
Frequency of child visiting closed, controlled aquatic locations (e.g. private and public swimming pools, spas)	Once a week	38% (75)	8% (6)
	Once or twice a month	28% (56)	14% (8)
	Rarely	34% (67)	10% (7)
Highest level of parent education	Postgraduate degree	10% (20)	11% (2)
	Graduate diploma/certificate	16% (33)	18% (6)
	Bachelor degree	20% (42)	7% (3)
	Certificate III/IV	21% (44)	13% (5)
	Year 12	19% (41)	18% (7)
	Year 11 or below	14% (30)	3% (1)
Household income	\$136 k–\$280 k	29% (63)	8% (5)
	\$88 K–\$135 K	30% (64)	8% (5)
	\$53 K–87 K	13% (27)	17% (4)
	<\$52 K	18% (39)	23% (9)

Note: N.B. Not all percentages sum to 100% due to missing data/questions not answered.

competencies satisfactorily as shown in Table 1. To determine whether there were interactions between demographic factors and VWSC achievements generalised linear modelling (GLM) using the logit function were performed. In these analyses, we included VWSC overall and each individual competency of the VWSC as the dependent variable. No significant interactions between variables were detected. Consequently, Chi-square tests of independence were conducted to identify whether NPAE resulted in differences in the overall achievement of the VWSC, as well as differences in achievement for specific knowledge and competency constructs that make up the VWSC. To evaluate the relationship between parent and child perceptions of NPAE, the Fisher's exact test was used.²²

Qualitative responses were analysed in accordance with the recommendations of Braun and Clarke²³ for thematic analysis. This involved each author independently reviewing and coding participant responses to identify common themes; discussion among authors about the codes and themes before finalising the overarching

thematic trends. Responses relating to NPAE were analysed inductively, aiming to capture parent and child perspectives of what constitutes NPAE, rather than being guided solely by theoretical underpinnings and definitions.²³ Due to the limited open-ended responses provided, this research primarily adopted a semantic level of analysis. The hope was that this exploration would stimulate further in-depth research that could incorporate a latent analysis of qualitative data concerning NPAE among children.

3 | RESULTS

Overall, 205 parents and 98 children completed the survey and responded to the questions regarding NPAE. Most parents and children reported they were born in Australia (81% and 92%, respectively) and did not identify as Aboriginal and/or Torres Strait Islander (98% and 95%, respectively). Most parents (81%) reported that their child did not have any medical conditions or disabilities. Further participant

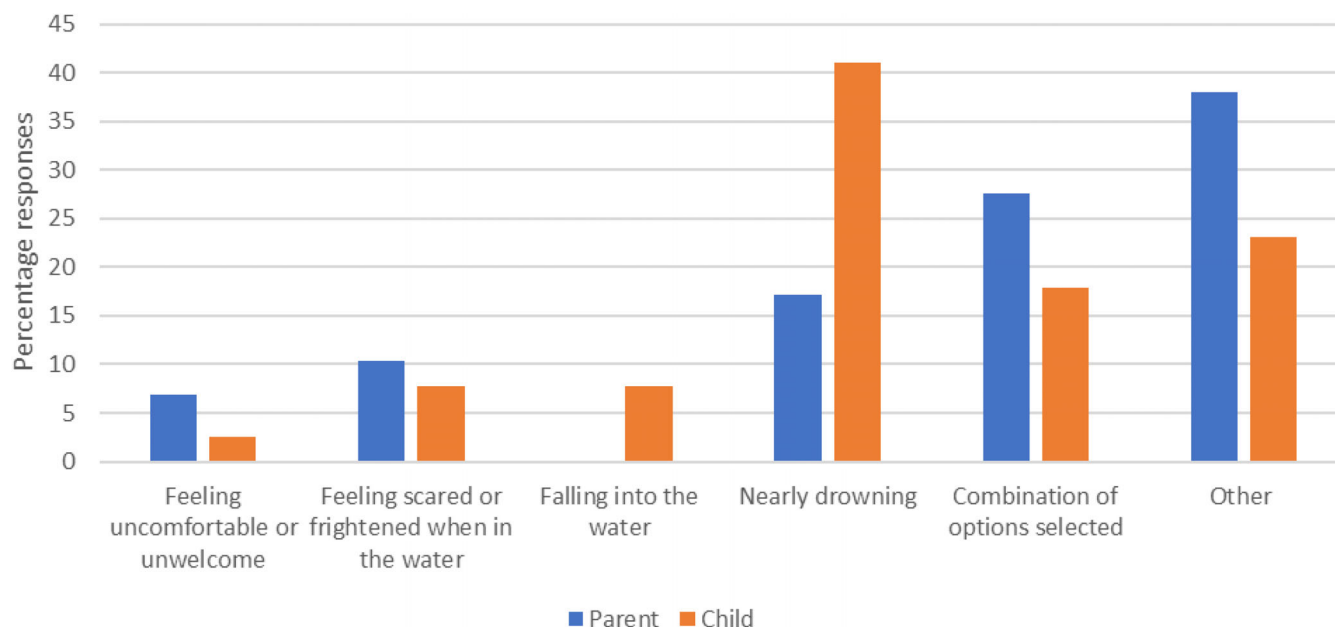


FIGURE 1 Parent and child self-reported negative aquatic experiences.

demographics are presented in Table 2 alongside the number of parents reporting their child to have an NPAE.

A total of 171 children completed the practical swimming assessment, with the majority (97.1%) not achieving the VWSC. Of the children that completed the survey, 85 had matched data, including parent survey, and VWSC assessment. The demographics of this matched group were representative of the larger cohort (described above) based on the percentage distribution across demographic variables, and 94.1% ($n = 80$) did not achieve the VWSC.

The majority of surveyed parents (82.9%) reported their child did not have NPAE, whilst smaller proportions reported their child had NPAE (11.7%) or were unsure (5.4%). Similarly, around half (51.0%) of the surveyed children reported no NPAE, while 39.8% of children did report NPAE and 9.2% were unsure. Of those children that reported NPAE, this was predominately perceived as nearly drowning (41%), other (23.1%), or a combination of options (for example, feeling uncomfortable or unwelcome and feeling scared or frightened when in the water; or feeling scared or frightened and nearly drowning). Similarly, parents were likely to report a combination of options (27.6%) and other (38%) (Figure 1). When another was selected, this was coded based on the location of the incident reported by both parents and children, including negative open-water experiences; negative closed-water experiences; and negative experiences in unspecified locations.

Among parents, NPAE was primarily documented in open water settings, where loss of control was evident in their narratives. Examples included being “swept downstream in a rockpool waterfall with a fast-moving current;” and “was on a boogie board and got caught in a rip at the beach.” Several parents also recounted NPAE without specifying the location, and these incidents were classified based on whether an intervention took place. Interventions ranged from being

“saved by a lifeguard;” or experiencing “nearly drowning in their eyes. An instructor was present, but it took several seconds for them to be helped.” In some cases, no intervention was described, such as when someone was “held underwater.”

Except for a single incident that occurred in open water, all NPAE reported by children were documented in closed water environments or in aquatic locations that were not specified. In both settings, the predominant theme in their narratives revolved around concern about underwater submersion. For example, “It was a very deep pool, and I was trying to get to the kids pool but then a little person wanted to pass so I had to let go of something to let them pass and I nearly drowned”; “sore head from being underwater”; and “I was on a pool noodle and it was between my legs. I accidentally put my foot on the back of it and tipped into the water. I was under for about 7 seconds”. Children also recounted a limited number of miscellaneous experiences, including instances like accidentally “walked into the pool when I wasn’t looking” and “feeling like I could not get out of the water.”

There was no significant difference in the achievement of the VWSC based on the parent ($\chi^2 = 1.108$, $df = 2$, $p = .575$) or child ($\chi^2 = 1.572$, $df = 2$, $p = .456$) reports of NPAE. However, when examining specific competencies within the certificate, it was noted that children whose parents reported NPAE for them were significantly less likely to pass the knowledge component ($p = .024$); the continuous 50 m swim ($p < .001$); and the survival sequence ($p < .001$). There were no significant differences in achievement for the underwater, rescue, or lifesaving competencies. In the case of children, those who reported NPAE were significantly less likely to pass the underwater competency ($\chi^2 = 6.085$, $df = 2$, $p = .048$), although no significant differences were evident for any other competencies in the certificate.

The results of Fisher’s exact test, used to evaluate the relationship between parent and child perceptions of NPAE, indicated a significant

difference. Children were significantly ($p = .019$) more likely to report having had NPAE compared to parents, 44% and 12%, respectively. The comparison revealed there was a high level of agreement (95.7%) between parents and children when neither reported the child having NPAE; however, this agreement decreased to 21.6% in cases where children reported NPAE. When categorised according to the specific experience, while small ($n = 5$), parents and children perceived them differently. For example, the parent reported the child feeling uncomfortable or unwelcome, or feeling scared or frightened, while the child reported nearly drowning, or experiencing multiple factors. In other cases, the parent reported experiencing multiple factors, while the child reported nearly drowning.

4 | DISCUSSION

It is becoming evident that NPAE have the potential to play a role in the development of children's aquatic competence.^{9,11} Analysis of data collected from both parents and children in this study demonstrated a notable discrepancy in the reporting and characterisation of NPAE. This suggests a distinct contrast between the child's perception of NPAE and that of adults. When neither parents nor children reported NPAE, there was a high level of agreement. However, consistent with other studies investigating parent-child agreement on health matters¹³ a large discrepancy emerged when children reported experiencing NPAE. Moreover, variance surfaced in the descriptions of NPAE. For example, parents reported the child feeling uncomfortable or scared, while the child recounted a near drowning incident. This finding suggests either a differing perception of the experience between parents and children, or more likely, given the differing contextual descriptions of the NPAE, and findings from previous research indicating parents often report more significant issues than children,¹³ parents may inadvertently downplay seemingly minor incidents and fail to recognise the impact on the child. The lack of concordance between parent and child perception of NPAE could affect the parent understanding of their child's aquatic competence and confidence, particularly as previous research has shown that children are more accurate in their perceptions of their aquatic abilities than their parents.²⁴ This may result in a missed opportunity to address fears or lack of confidence if only parent perceptions are considered, and suggests children should be afforded an opportunity to express their concerns independently.

Of the reported NPAE disclosed by parents, most indicated that their child's NPAE occurred in an open water setting, such as a river or beach, corroborating earlier findings.¹¹ In these reported cases in the current study, parents perceived their child to be in danger due to unforeseen events, leading to a loss of control in the situation or activity the child was engaged in. Consistent with prior research,^{11,25} the current study suggests that children can also be impacted by NPAE occurring in closed aquatic environments, such as swimming pools. This finding is of particular concern, given that swimming pools are frequently the location for structured aquatic education where children are expected to learn competencies and water familiarity.

Swimming lesson providers should take note of this and make attempts to avoid such incidents during their lessons to prevent long-standing impact on the child. Further, these variations in reporting and perceptions regarding NPAE are important for swimming instructors to comprehend, allowing them to tailor lessons to each child's individual needs. While valid, and common practice to ask parents about a child's aquatic experiences and abilities, particularly when working with younger children, those who are non-verbal, or individuals with disabilities such as Autism Spectrum Disorder,^{26,27} This research has identified the importance of engaging directly with children to explore their fears and concerns.

Recognising the impact on a child is crucial for their social and mental well-being, and both parents and swimming instructors should be mindful of the psychological effects fear or concern may have during lessons and shape their approach to lessons accordingly. The experience and abilities of the swim instructors will play a pivotal role in their capacity to provide personalised programs for each child based on their individual needs. The presence of mixed abilities and experiences within a class can be a common challenge for educators^{28,29} and aquatics is no exception. Previous research has examined the effectiveness of providing specialised training to swimming instructors, aiming to enhance their ability to teach swimming skills to particular groups.²⁶ Findings from this current research suggest the development of similar educational initiatives may be needed to equip swim instructors with insights into NPAE causes, prevention strategies, and methods to assist children in overcoming such experiences. Such educational support would enable instructors not only to mitigate the occurrence of NPAE in aquatic education environments but also to foster positive aquatic experiences for children and provide optimal support for achieving benchmark aquatic competencies.

Regardless of the NPAE location, children whose parents reported such incidents were less likely to achieve three elements of the VWSC: the knowledge component, the continuous 50 m swim, and the survival sequence. Notably, the description of children's NPAE often included concerns about being underwater, and children reporting an NPAE were significantly less likely to achieve the underwater component of the VWSC. While further research with a larger sample is needed to validate these findings, these collective results suggest that a reported NPAE, whether by parents or children, may indicate specific aquatic competency gaps in the child, necessitating tailored education. Swimming instructors aiming to gain a comprehensive understanding of a child's fears and concerns can actively address these issues by fostering a supportive swimming group environment and implementing activities that progressively enhance aquatic competence development and confidence. Techniques such as systematic desensitisation and constructing a fear hierarchy, as suggested by Stillwell,²⁵ or differentiated instruction,^{28,30} may be valuable in this context. However, it is important to note that aquatic competency progression might experience delays when addressing aquatic-related fears, therefore a review of educational program schedules may be required.³¹

This research enhances our understanding and highlights the importance of considering both parental and child perspectives on

NPAE. However, the study is not without limitations. Reflective of the limited swimming competency of primary school children in Victoria, few students were classified as achieving the VWSC. This result raises concerns regarding the uneven distribution of this variable in our analysis and the potential implications for generalisability of our findings. Replicating the study with a larger proportion of students capable of attaining the certificate would offer deeper insights into the demographic factors that hold significance in this context. The research is geographically confined to a single state in Australia, and a substantial number of parents in the study reported that their child had not encountered NPAE. While this might reflect the prevalence of NPAE in the local population, studies with larger and more diverse samples or comparative analyses across different countries would likely provide further insight into this issue and clarify any sociodemographic differences in NPAE. Furthermore, this study relies on self-reported data from parents and caregivers, and is thus contingent upon their knowledge, willingness, and accuracy in reporting NPAE. It is plausible that incidents might have taken place at a young age, which parents reported, but the children are unable to recall. Future research should consider capturing the age at which NPAE occurred to enhance the depth of understanding. Given the limited provision of data constrained to survey questions, we propose further prospective and quantitative research to obtain a comprehensive understanding of how NPAE impact on a child's progression through a swimming program. Finally, exploring the perspective of swim organisations and instructors regarding their support for families dealing with NPAE, as well as their efforts to minimise the likelihood of negative experiences in programs would be a valuable addition to the existing knowledge base.

5 | CONCLUSION

In conclusion, this study, to the best of the authors' knowledge, is the first to examine both parent and child perceptions of the child's NPAE, and to directly measure the impact of a self-reported NPAE on a child's aquatic competence. The findings align with previous research suggesting that NPAE can impact on a child's ability to fully engage in aquatic programs.¹¹ As such, this research recommends that swim instructors gather information about the child's previous experiences, ideally from both the parent and child, before commencing swimming lessons. In doing so, instructors should be prepared to consider and address these factors in the delivery of aquatic education.

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CONFLICT OF INTEREST STATEMENT

HC works for Life Saving Victoria.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ETHICS STATEMENT

This research received full ethical approval from the Human Research Ethics Committee at Federation University Australia, project approval number A22-009. Ethical approval was also granted by Research Committees at the Victorian government Department for Education; and, the Melbourne, Ballarat, and Sale Archdioceses for Catholic Schools in Victoria.

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