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RESEARCH ARTICLE

Bush Nippers: Evaluating the effectiveness of the Nipper education program in regional inland Victoria, Australia

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Abstract

Issue addressed: Internationally, inland waterways are identified as leading locations for drowning. 'Nippers' programs provide coastal lifesaving and water safety knowledge and skills to children aged 5-14 years in Australia. However, a 49% increase in Victorian inland waterway drowning compared with the 10-year average, necessitated adapting the Nippers water safety program to inland regions: Bush Nippers.

Methods: Overall, 105 participants from two age groups (under 9 and under 12) were involved across three Bush Nippers programs delivered at river and/or pool locations in regional Victoria, Australia. Surveys and observations assessed participants' water safety knowledge and competencies, and used alongside interviews to obtain program feedback from parents, instructors and communities. Costs were compared to other aquatic programs to determine feasibility of replicating the program.

Results: Significant increases in knowledge from pre to immediate posttest were recorded ($P < .05$) and water competencies were high posttest. Communities were grateful for the regional program delivery and understood the necessity of learning lifesaving skills, particularly in open water environments. Costs were akin to other similar programs indicating program replicability and enhancing likelihood of uptake.

Conclusions: Bush Nippers increased water safety knowledge in children and was well received by the community. Wider uptake of the program is encouraged to diversify aquatic education for regional Victorian children.

So what?: Given the high regard and demand for the program, and importance of learning lifesaving skills, provision of a scalable lifesaving program in inland regions may address the drowning trend and improve aquatic participation.

KEYWORDS

drowning prevention, inland waterways, lifesaving, program evaluation, regional communities, water safety

1 | INTRODUCTION

Inland waterways have been identified internationally as prime locations for drowning.¹ Within Australia, inland waterways are the most

common locations for fatal drowning²: 29% ($n = 80$) of all drowning deaths in 2019 were reported to have occurred in rivers, creeks and streams, followed by 26% in beaches and 11% in swimming pools.³ Possible explanations for this include the unique dangers of these

waterways owing to risks such as changeable conditions, geographical isolation, alcohol consumption and inadequate supervision of children, as well as inland waterways becoming increasingly popular for recreational activities (eg swimming, fishing, picnicking).²

Reducing drowning in inland waterways has been identified as a priority by the World Health Organization (WHO)¹ and the Australian Water Safety Council.⁴ However, the 2019 Australian national drowning report indicated the number of drownings in rivers, creeks and streams increased by 5% on the 10-year average (2008/09 to 2019/19)³. Victoria was the only state or territory to record an increase (33%) in drowning deaths in all waterways compared to the 10-year average.³ The highest increases in Victorian drownings against the 10-year average were recorded in inland waterways (49%), with 38% of all 2018/19 drowning incidents occurring in rivers, creeks, streams, lakes and dams.⁵ Furthermore, residents in regional Victoria, were almost twice as likely to drown compared to those in major cities.⁵ This highlighted a need for Victorian drowning prevention efforts to focus on inland waterways, and waterways in regional locations.

Two of the top three inland drowning blackspots in Australia are in the state of Victoria, specifically the Murray and Yarra Rivers.^{6,7} The Murray River runs along the border between Victoria and New South Wales and extends into South Australia.⁵ Despite Victorian residents comprising the majority (53%) of Murray River drowning deaths,⁸ state government legislation dictates drowning incidents which occur in the Murray River are reported in New South Wales.⁵ Accordingly, rates of Victorian river drownings are likely underestimated.

Peden, Franklin and Leggat² collated data from all unintentional river drowning fatalities in Australia from July 2002 to June 2012 to identify prominent risk factors and advance prevention efforts. Children (aged 0-17 years) were identified as being 1.75 times more likely to drown following a fall into a river than adults ($P < .04$). Victorian children have also been shown to be at a high risk of drowning in inland waterways: analysis of coronial records of drowning incidents in Victorian children aged 0-14 years found that 34% of deaths occurred in an inland waterway.⁹ In addition, Victorian children living in regional areas were more likely to drown than those living in metropolitan areas.⁹ Research of Victorian school children's swimming competency reported that teachers estimated 60% of Victorian Year 6 students would not be able to swim 50 meters, and 40% would not be able to float for more than 2 minutes.¹⁰ Water safety knowledge was also estimated by teachers to be low in ~39% of Victorian Year 6 students.¹⁰ This collective evidence indicated the importance for Victorian children to learn how to be safe in, on and around inland waterways.

Despite these findings, there is a lack of information in the literature which details evaluated efforts to improve school children's water safety and lifesaving skills and knowledge.¹¹ Best practice recommendations for inland drowning prevention efforts have suggested a child's formative years while in primary school are key for creating lasting, lifelong behaviours.^{10,12} Accordingly, provision of water safety education and swimming lessons for children has been suggested to be best offered in the primary school timetable.^{10,12} Therefore, it is imperative that programs are conducted to improve

children's water competencies, including swimming, lifesaving and water safety knowledge and skills.^{13,14} These programs should be regular and ongoing in their delivery to establish steadfast learnings and enhance skill and knowledge retention,^{15,16} and also evaluated to comprehend and enhance effectiveness.^{14,17,18}

This study aimed to determine the feasibility and effectiveness of a new child-focused lifesaving, swimming and water safety program delivered in inland regional areas of Victoria: 'Bush Nippers'. Specifically, the study aimed to evaluate:

1. The development of participants' personal water safety and lifesaving competencies and knowledge;
2. Program feedback from participants', their families and communities;
3. The program costing of the pilot Bush Nippers model and its feasibility for statewide implementation.

2 | METHODS

2.1 | Bush Nippers program

The Bush Nippers program was developed to enhance Victorian children's water safety and lifesaving skills and knowledge through discussions and practical activities. An evaluation of the effectiveness of the beach Nippers program was conducted and the potential for application of Nippers to a regional setting was explored.¹⁹ Outcomes from this evaluation indicated adapting Nippers to a regional setting was a feasible undertaking and offered a set of recommendations for adapting and delivering the Nippers program as a regional product focusing on inland and pool locations.²⁰

The Bush Nippers program contained similar components as the coastal program to encompass the lifesaving sporting component, but also with a focus on inland waterway settings to enhance the lifesaving and water safety skills and knowledge of participants. Water safety practical skill-based competencies included: floating, swimming, safe water entry and exit, rescues, lifejackets and survival swimming. More sport-based practical skills included: Ironman/Ironwoman; run-swim-run and sprints/relays. Education covered in the Bush Nippers program included: first aid; staying fit and healthy and, understanding aquatic environments. Consistent with the beach Nippers program, Bush Nippers was delivered by qualified swim instructors (known as Age Managers) who were recruited by the aquatic centres where the programs were delivered and provided training to deliver the Bush Nippers program by Life Saving Victoria qualified personnel. Three programs were delivered—two in Northern Victoria and one in Central Victoria. To complete the program, participants were required to attend 10 × 1 hours sessions in summer/autumn 2020 through an intensive 5 days in the school holidays, or across 10 weeks during the school term (Table 1). Where possible, the same Age Managers delivered the sessions to participants, but detailed lesson plans ensured standardised delivery in any case where consistent instructors were not possible.

TABLE 1 Details of programs delivered in each inland regional location

Site number	Location details	Program delivery details			Number of participants
		Environment	Mode	Type	
1.	Northern Victoria, population ~14 000 and 220 km from Melbourne	River	Intensive (5 days)	Holiday program	21
2.	Northern Victoria, population ~50 000 and 190 km from Melbourne	Pool	Intensive (5 days)	Holiday program	14
3.	Central Victoria, population ~110 000 and 120 km from Melbourne	Pool & lake	Weekly (8 weeks. Two weeks cancelled due to COVID-19)	In-school program (3 local primary schools)	70

2.2 | Design

Mixed methods with pre and posttesting were used to evaluate this pilot Bush Nippers program. Evaluation took place across three inland regional locations in Victoria, Australia (Table 1). A fourth location was cancelled due to bushfires in the region, and two sessions in Location 3 were cancelled due to COVID-19, Coronavirus restrictions. Locations for program implementation were selected based on drowning data profiles which identified local government areas at greater risk for drowning incidents to occur, or people residing in the region being at the greater relative risk of drowning.²¹

Ethics approval was granted from a University Human Research Ethics Committee and the Research in Schools and Early Childhood Settings Committee from the Victorian Government Department of Education and Training prior to data collection.

2.3 | Participants

Primary schools in the identified regions were contacted and invited to participate in the Bush Nippers program. Schools that agreed to participate notified parents of the opt-in program: receiving consent from both parents and children. The age of participants recruited aligned with levels of the Victorian Curriculum²²; the Victorian Water Safety Certificate²³; National Swimming and Water Safety Framework²⁴; and Swim and Survive.²⁵ Accordingly, two age groups were used for the program: Under 9s (aged 8-9 years, Year 2/3 of primary school) and Under 12s (aged 11-12 years, Year 5/6 of primary school). Alongside age of participants, their gender and experience with activities in different aquatic environments were also collected.

2.4 | Data collection and analysis

2.4.1 | Participant outcomes

Knowledge

Participants' water safety and lifesaving knowledge including self-preservation and/or saving another person was measured through a purposefully designed survey which was developed based on the measures used in the aforementioned evaluation of beach Nippers,

alongside consultation with experts in water safety, and refined following panel review for content and face validity. The survey was distributed before and immediately after the program, and included 15 questions. Seven questions captured demographic information about participants and their experiences with aquatic environments and activities, and eight multiple-choice questions assessed water safety knowledge relating to signage recognition and interpretation, and safe behaviours in and around aquatic environments (eg 'What should you do if you get in trouble in the water'? [answer choices: Hope for the best, someone should see you; Panic and wave as much as you can to get a person's attention; Stay calm, float, raise one arm, wave and yell loudly 'HELP'; Swim to shore as fast as you can]). Two versions of the survey were developed, varying only to reflect reading abilities and slight differences in program content for each participant group (ie Under 9s and Under 12s).

Observed competencies

Age Managers, or equivalent personnel, completed posttest observations of 21 competencies including: practical skills (12 components, for example float on back for 60 seconds (under 9s)/3 minutes (under 12s); safe water entry and exit; out of water rescues; rescue elements (run-swim-run); safe use of lifejackets and Nipper boards; and survival swimming) and education (8 components, eg understanding of aquatic environments; first aid). These competencies were used as they form the standard assessment for the Victorian Water Safety Certificate: a Victorian Government initiative which highlights specific aquatic competencies students should achieve by the end of primary school, and designed to complement existing aquatic programs delivered to this age group by schools and learn-to-swim organisations.²³ Participants were scored on capability for each competency on a scale of 0-3 (0 = did not cover in program; 1 = did not attempt; 2 = participated, not competent; 3 = participated, competent). Observations of competencies were only conducted postprogram and therefore used in this evaluation.

2.4.2 | Program feedback

Surveys gathered feedback from parents immediately after the program through 11 questions, including multiple-choice and open-ended question styles about their child's involvement and experience

with the program, parent perceptions of the content and proposed costs (eg 'What do you think is the most valuable thing your child has learned or gained from the Bush Nippers program?'; 'Was there anything that made it difficult for you/your child/your family to attend the Bush Nippers program?'). Parents were also asked to rate their child's water safety, lifesaving and survival skills and knowledge before and after the program on a 5-point scale (1 [Poor] to 5 [Excellent]). Similar to the knowledge surveys, the parent survey questions were developed and refined based on the parent surveys used and subsequent feedback obtained through the beach Nippers evaluation, and following a panel review of experts in water safety.

Semi-structured interviews were also conducted with Age Managers to determine overall impact of the program on the children. Questions covered the Age Manager's perceptions of the program and the children's experiences, as well as any recommendations they had for improving the content. Examples of questions included 'What is the main thing the children learned about lifesaving in the Bush Nippers program?' and 'Do you have any suggestions on how we can retain more Bush Nippers for next year and beyond?' Council representatives from the location sites were also asked for their overall feedback of the program, and this was provided in the form of a statement and integrated into the qualitative analysis.

2.4.3 | Program costings and feasibility

Program costs per participant per hour were calculated based on total set up costs (with equipment and full training) and program running costs (including staffing, resources, permits and 25% training load for new Age Managers). These costs were broken down for different program sizes (ie 50, 75 or 100 participants). In the program feedback component of this research, parents and Age Managers were invited to provide suggestions for program costs as there was no fee for this pilot program. This information was then used to compare to other similar programs, such as holiday programs and other Nippers programs, to determine the long-term feasibility and potential sustainability of the Bush Nippers program.

2.4.4 | Data analysis

Survey responses were manually inputted into Microsoft Excel and cleaned to determine accuracy, and identify and correct (if possible) any absent or missing data. Data were then transferred to IBM SPSS Version 25 software. Correct responses in the knowledge surveys were coded in SPSS and total correct responses for each participant were calculated for the pre and posttest surveys and used for analysis. Descriptive statistics summarised frequency and demographic data, and paired samples *t*-tests identified any significant differences in participants' total knowledge score (percentage correct) between the pre and posttests. No outliers in the data were detected, as assessed by inspection of a boxplot, and a Shapiro-Wilk test indicated differences between the pre and posttest survey results were

normally distributed ($P = .687$), therefore means and standard deviations were used. Participants' scores for each observed competency were collated and descriptive statistics summarised competencies among all participants by age group.

Qualitative responses from the Age Manager and Parent survey questions were collated and thematic analysis was conducted in accordance with recommendations of Braun and Clarke.²⁶ This process was performed in a deductive manner to identify themes which corresponded to the research questions and contributed to the program evaluation process. Themes were developed following systematic review, coding and discussion of the qualitative data, codes and themes among the researchers.

3 | RESULTS

3.1 | Participant characteristics

Participants in the under 9 age group had a mean age of 8.1 years and 59% were male, and those in the under 12 age group had a mean age of 10.9 years and 56% identified as male. Over 90% of participants in both age groups had previous experience recreating in open and closed aquatic environments, such as swimming in pools, rivers, lakes and the ocean. Approximately 80% of all participants had participated in aquatic sport, such as surfing/bodyboarding, rowing and boating. However, over 70% of both groups had never participated in: Beach Nippers; triathlons; swimming club and water skiing/wakeboarding/jet skiing.

3.2 | Participant outcomes

3.2.1 | Knowledge

Overall, 105 participants completed the pre and posttest knowledge surveys: 57 under 9s and 48 under 12s. Due to the Coronavirus (COVID-19) pandemic, many posttest surveys were not completed across all sites—the response rate was 56.4%.

Among the whole sample, knowledge scores had a mean increase of 4.93% from pre to posttest: a statistically significant increase (95% CI, 1.26-8.6), $t(104) = 2.67$, $P = .009$, $d = 0.26$. On closer analysis, this difference was due to significant changes in the under 9 group only, who recorded an 8.84% mean increase in knowledge scores from pre to posttest (95% CI, 3.428-14.261), $t(56) = 3.271$, $P = .002$, $d = 0.4$. No statistically significant difference was recorded for the under 12s (Table 2).

Among under 9s, participants who had more experience recreating in closed aquatic environments (ie at least once or twice a month), demonstrated significantly higher increases in knowledge scores from pre to posttest ($M = 12.83\%$) compared to less experienced participants ($M = -7.74\%$), (95% CI, -38.673 to -2.454), $t(56) = -2.275$, $P = .027$, $d = -0.9$. No other significant differences in knowledge scores were recorded in either age group based on

TABLE 2 Mean knowledge score (%) and standard deviation on the knowledge survey

Knowledge assessment	Under 9s (N = 57)	Under 12s (N = 48)	Total sample (N = 105)
Pretest			
Mean knowledge score (%) ± SD	70.47 ± 13.44	75.76 ± 17.27	72.89 ± 15.46
Posttest			
Mean knowledge score (%) ± SD	79.31 ± 14.24	76.04 ± 16.64	77.82 ± 15.39
P-value	.002	.091	.009

TABLE 3 Observed competencies of participants

Observed competency	Under 9s (n = 79), %	Under 12s (n = 64), %
Practical skills		
Competent	56	54
Not competent	16	13
Did not attempt	2	5
Not assessed	26	26
Education		
Competent	64	66
Not competent	16	9
Did not attempt	3	2
Not assessed	17	20
Overall skill		
Competent	59	59
Not competent	16	11
Did not attempt	2	4
Not assessed	23	25

previous aquatic experience. However, for both age groups, aspects of the knowledge survey which were consistently answered incorrectly related to: who is the priority in an emergency scenario; when CPR should be commenced; and, identifying the meaning of water safety signage, particularly referring to strong currents. The under 12 age group also often incorrectly answered questions regarding defining DRSABCD.

3.2.2 | Observed competencies

Seventy-nine under nine participants and 64 under 12 participants were assessed posttest on their lifesaving competencies, specifically relating to their: practical skills and education. Table 3 presents the competencies of participants and the percentage of participants assessed. 'Not Assessed' includes participants who did not want to be assessed, absent participants and cancellations due to COVID-19.

Among those assessed, competency was highest in the under 9 age group in the following: sprints/relays; run-swim-run and knowledge about becoming a community lifesaver. Lowest competency was in the Ironman/Ironwoman and education on first aid. Among those assessed in the under 12 age group, highest competencies

were recorded for the following: sprints/relays; water safety knowledge; rescues out of the water; and correct use of lifejackets. Lowest competencies for the under 12s were as follows: swim 100 m free-style; float on back for 3 minutes and survival swimming. No significant differences in competency scores were recorded for either age group based on previous aquatic experiences.

3.3 | Program feedback

3.3.1 | Parents

Sixteen parents (under 9s = 10, under 12s = 6) from Location 1 (N = 7) and Location 2 (N = 9) completed a feedback survey, evaluating the pilot Bush Nippers program. Descriptive and frequency statistics for the quantitative responses are provided in Table 4 and the qualitative responses are provided in Table 5.

Regarding main skills and/or messages children gained from participating in Bush Nippers, under nine parents and under 12 parents responded similarly and their responses are reported together. The main overarching theme from this question was that Bush Nipper participants developed an understanding for water safety in different aquatic environments:

"Learning water safety in an open water environment. Understanding about currents, and the dangers of what may lie beneath the surface." (Under 9 Parent).

"Safety and hazard identification in a natural environment. I feel that the river setting for the program is the most valuable – it would not be the same in a pool, and there are plenty of other pool-based safety programs" (Under 12 Parent).

A secondary theme also popular among parents was the acquisition of practical skills, related to first aid and rescues, and the opportunity to practice these in different aquatic environments.

3.3.2 | Age Managers

Twenty-four Age Managers completed the Bush Nippers feedback survey across the three locations (Location 1 = 6; Location 2 = 8;

TABLE 4 Parent responses to the Bush Nippers pilot program feedback survey

Quantitative feedback	Under 9s	Under 12s
Child's gender		
Male	6	5
Female	4	1
Enjoyment from 0 (low)–10 (high)		
Mean ± SD	8.9 ± 1.52	8.5 ± 1.8
Recommend to others?		
Yes	80%	100%
No	20%	–
Suggested cost for 10 sessions per child		
Mean (range)	\$75 (\$50-\$100)	\$79 (\$20-\$200)
Child's lifesaving skills and knowledge ^a : mean (SD)		
Before program	2.4 (1.1)	2.7 (1)
After program	4 (1.1)	4.7 (0.8)
Difference (%)	+67%	+74%
Child's water safety skills and knowledge ^a : mean (SD)		
Before program	3.5 (1.1)	3.8 (0.4)
After program	4.3 (1.1)	4.7 (0.8)
Difference (%)	+23%	+24%
Child's survival skills and knowledge (ability to keep themselves safe) ^a : mean (SD)		
Before program	2.8 (1.2)	3.5 (0.8)
After program	4 (0.8)	3.7 (2)
Difference (%)	+43%	+6%

^aEstimated by parent on a scale from 0 (low) to 5 (high).

Location 3 = 10). When detailing their overall impressions of the program, 87.5% stated they felt the program was a success and 61.5% would work with the program again. The main reasons provided for these responses related to the observed effect on the participants, such as 'Everyone came away happy and keen to go again in following years', and the necessary skills they learnt through the program, such as survival swimming and water safety. Factors encouraging involvement included: the resources provided; previous experiences; and program location. Reasons for citing the program as unsuccessful and not wishing to be involved again mostly encompassed the training provided to Age Managers and the structure of the sessions, such as 'More training required to teach sessions confidently'. Age Managers involved with the Bush Nippers program delivery in an open water setting were more likely to rate the program highly compared to those delivered in a pool.

Several Age Managers interviewed referenced some conversations they had held with parents and the public regarding the Bush Nippers program, which suggested these groups perceived it to be a positive and beneficial program to the participants and local area:

"I haven't heard one negative comment from any of the families, everyone's saying this is the best thing that the Shire has ever done."

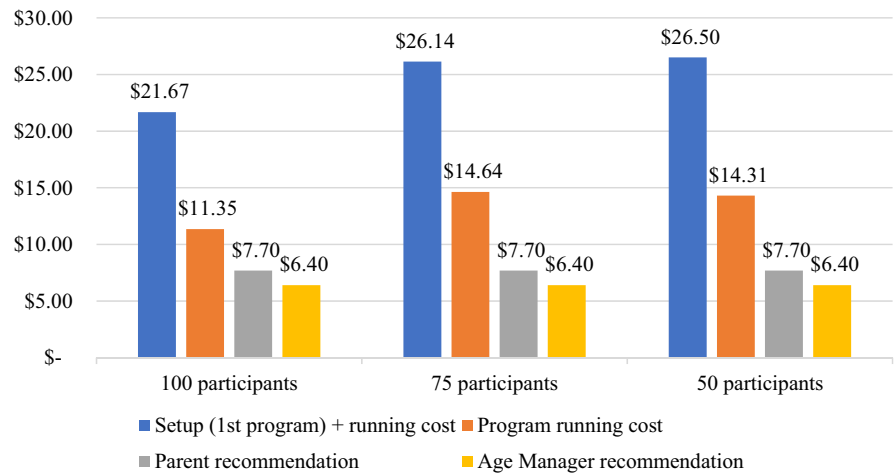
"They [parents] could not believe that their child is doing things in the water as they would be hesitant doing those activities otherwise."

"General public at the aquatic centre said how great it looked, and how much the kids were having a good time."

TABLE 5 Parent's qualitative feedback on the Bush Nippers pilot program

Under 9s	Under 12s
<i>Child's most enjoyed activity</i>	
Fun Games; Water-based practical skills (eg rescues, swimming) Using Nipper boards/new equipment	Water-based practical skills (eg rescues, swimming) Social aspect; Using Nipper boards/new equipment; Gaining water safety knowledge
<i>Factors making it easier to participate</i>	
Program location Being able to participate in activities without the pressure of winning; The program was free	Program location Being able to participate in activities without the pressure of winning; Session times; Relevant safety information for other aquatic activities and sport (eg fishing, boating)
<i>Factors making it more difficult to participate</i>	
Timing	Being the only girl in the group
<i>Reasons for recommending or not recommending the program to others</i>	
Yes	
Development of skills is needed as most Australian drownings occur inland Good for health and wellbeing	Important for the development of life skills Good for health and wellbeing Good for making new friends
No	
Should be held in open water (pool-only program participant)	

FIGURE 1 Bush Nippers running costs per participant per hour compared to parent and Age Manager recommended costs



Despite this, one theme regularly emerged regarding community engagement which related to making Bush Nippers more accessible to children from Aboriginal and Torres Strait Islander communities, as well as those from culturally and linguistic diverse communities. Other recommendations for improving the program included: more tailoring of the content to suit the aquatic environment of delivery; more comprehensive training for Age Managers and providers; reassessment of participants' swimming abilities; lower Age Manager to participant ratios; and, integrate Indigenous Australians' knowledge and experiences into the content.

3.3.3 | Council

Statements from local Councils from two locations offered feedback on the Bush Nippers program. Overall comments were very positive, and they were appreciative that such a program was delivered in regional locations:

"It was absolutely our pleasure having [the organisation] here running a brilliantly fun and engaging program. With your support I really hope we can continue to offer Bush Nippers into the future." (Location 1)

"Living in this river environment, it's fabulous to give local kids this opportunity to learn safety in the river." (Location 2)

3.4 | Program costing and feasibility

As shown in Table 4, the cost parents felt would be acceptable for the Bush Nippers program ranged from \$20 to \$200 per child for the 10 sessions, with a mean cost of \$77 overall and \$7.70 per hour. In comparison, the Age Managers' mean suggested cost for Bush Nippers was \$64, approximately \$6.40 per hour. One important comment which reoccurred among most parents was that family discounts should be offered to ease the costs of multiple children

participating and to make it an accessible program. Furthermore, one of the Age Managers felt that funding would be essential for schools where many students are from low socio-economic backgrounds and rural areas. Figure 1 presents the pilot Bush Nippers program running costs for different program sizes compared to the parents' and Age Managers' suggested costs.

The running costs per participant per hour for Bush Nippers (range \$11.35-\$14.64) were comparable to other similar programs, for example: a holiday swimming program (range \$12-\$40); school-run learn-to-swim lessons (range \$10.40-15.90 excluding transport and funding support); and, Nippers coastal programs (range \$11.80-\$21).

4 | DISCUSSION

This study evaluated the effectiveness of a pilot Bush Nippers program within regional Victoria which was developed to address a gap in programs delivered in open water inland environments. Results demonstrated that Bush Nippers can successfully increase regional Victorian children's water safety and lifesaving skills and knowledge, and should be considered as a viable program to provide a progression from skills learnt in controlled aquatic environments (eg pools) to those required in open waterways. The program was positively received by most parents, communities and staff delivering the program, but suggestions emerged for improving accessibility and inclusivity of the program and its content. Finally, the costs of the Bush Nippers program aligned with other similar programs: demonstrating its feasibility and repeatability akin to other water safety and lifesaving programs delivered in Victoria.

Lifesaving and water safety knowledge significantly increased throughout the program for participants in the under 9 group, but did not change for those in the under 12 group. A possible explanation for this is the baseline knowledge levels of this younger group may have been lower due to a lack of exposure to the content before reaching their final years of primary school. Currently, the Victorian Curriculum and Assessment Authority stipulates water safety competencies which Victorian children should achieve by the end of primary school,²² that is the Victorian Water Safety Certificate. Accordingly, the Bush Nippers program may have included and assessed on similar

content covered towards the end of primary school for the older, under 12 participants, and not expanded their current understanding as much as for the younger group who may not have been exposed to such content yet. This should be considered in future applications of the program. This improvement in knowledge is consistent with previous research which also found that an open water program enhanced children's water safety knowledge from pre to posttest and this change remained at a 3-month follow-up.²⁷ Yet, this investigation²⁷ did not assess knowledge improvements in individual age groups as in this current study, therefore direct comparison of learnings is not possible.

Among participants involved in the lifesaving competency assessments, several did not attempt the competency, particularly in the under 12 group. This could suggest a lack of confidence and/or engagement in the program, particularly if the duration and number of the lessons were not enough to enhance confidence/engagement. Previous research has identified that children's engagement in physical education can depend on their confidence, preferring to participate in those activities which they perceive themselves as competent.²⁸ Furthermore, this age group have previously been found to be more engaged with activities which they perceive as important, interesting and useful.²⁸ Accordingly, while some participants may not have wanted to complete assessments in this pilot Bush Nippers program, it is crucial that instructors in future reinforce the necessity for completing assessments to determine one's own abilities, and how this can act as a drowning prevention measure. They could also look at ways to make the assessments fun and engaging rather than focus on it being a 'test'. It would also be valuable to review the content and delivery duration of the Bush Nippers program, particularly for this older age group, to see if any amendments can be made to make it more engaging and/or build confidence. In addition, due to the novel outdoor, open water component of this program which aligns with best practice recommendations for water competency training (eg 13), it would be beneficial to determine the longitudinal effect of Bush Nippers on participants confidence and competence in and around the regional waterways, akin to that demonstrated by Button et al.²⁷

The program feedback of Bush Nippers program was positive, as responses from council members, parents and the observing public (discussed by Age Managers) indicated a high interest in water safety activities within these communities. A consistent theme from the parent surveys was that learning lifesaving skills in the open water environment were one of the programs' strengths. However, it was noted that a barrier to impact and engagement with the program was that the open water component was not included in all iterations of the program. Without an accurate understanding of their own lifesaving, water safety and survival skills in a variety of environments, this young age group could be at a higher risk of experiencing a drowning incident. Drowning prevention recommendations are for people to develop water safety skills in different environments and contexts (eg when tired, in open water) to foster accurate perceptions of their abilities.^{13,29,30} Accordingly, in future Bush Nipper programs, it is vital that participants get the experience of the open water component, particularly as this component enhanced learning, enjoyment and engagement in the program.

Future Bush Nippers programs conducted should also align with similar costings as was incorporated into this program. The cost of this Bush Nippers program was comparable to other similar programs on offer and this is likely crucial to the program success as it determines program uptake by families, aquatic facilities and schools (particularly those in high-risk inland locations). However, consistent with research surveying parent/guardian thoughts about swimming lessons,³¹ program costs were seen as a potential limiting uptake factor among Bush Nipper parents, therefore program subsidies should be considered, particularly in low socioeconomic areas.

4.1 | Limitations

A limitation of this research was that participants in the Bush Nippers program conducted postprogram competency assessments only—no preprogram assessment was conducted and therefore no indication of program impact on aquatic competency was determined. While this will be required in future program iterations, it is important to note that previous research has indicated Victorian primary school students' have low swimming ability,¹⁰ yet the postprogram competencies of those participants assessed were promisingly strong, acknowledging they had since completed the Bush Nippers program. In addition, other water safety interventions of similar duration have shown significant increases from pre to posttest.¹¹ Another limitation with this project was that follow-up assessment of knowledge and competencies was not conducted, therefore it remains unknown if the knowledge and skills attained were retained over time. Future research is required to determine this program effect. Finally, while efforts were made to recruit a large and diverse sample of parents to offer feedback on the program, only 16 were recruited and the views expressed may not be representative of all parents of program participants. Likewise, as the program on offer was free for participants, this may have impacted parents' responses and should be considered in future iterations of the program when comparing findings.

5 | CONCLUSION

Bush Nippers had a positive impact on the water safety knowledge in children and was received well by parents, communities and Age Managers. Based on these results, wider uptake of the Bush Nippers program is encouraged. The open water component within this program strongly aligns with best practice recommendations for water safety education, and strengthens the need for this program particularly in inland, regional and low socioeconomic locations. The costings of this program were also comparable to that of other, similar programs and suggest its enhanced feasibility and repeatability potential. Further work is required to determine the long-term impact on participants' knowledge, as well as the change in participants' aquatic competencies throughout the program.

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CONFLICT OF INTEREST

The majority of the authors work for Life Saving Victoria's Risk and Research Department, however, they were independent of the implementation of this program and were only involved for the evaluation purposes.

ETHICS

Ethics approval was granted from the University of Southern Queensland Human Research Ethics Committee (H19REA304) and the Research in Schools and Early Childhood Settings Committee from the Victorian Government Department of Education and Training prior to data collection.

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