Volume 06 Issue 02 (2025) Pages 98-105

INSPIREE: INDONESIAN SPORT INNOVATION REVIEW

ISSN 2746-6965 (Online), 2774-2520 (Print)
Journal Homepage: https://inspiree.review/index.php/inspiree

ORIGINAL RESEARCH ARTICLES

OPEN ACCESS

Integration of Cognitive-Behavioural Therapy with Adaptive Swimming Instruction for Children with Water-Related Anxiety Disorders: A Randomised Controlled Trial

https://doi.org/10.53905/inspiree.v6i02.147

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ABSTRACT

The purpose of the study. To evaluate the effectiveness of an integrated swimming instruction program combining cognitive-behavioral therapy (CBT) principles with adaptive aquatic techniques for children with water-related anxiety disorders, comparing outcomes with traditional swimming instruction methods.

Materials and methods. A randomized controlled trial involving 120 children aged 6-12 years with diagnosed anxiety disorders featuring water-related fears di kota Medan, Indonesia, Indonesia. Participants were assigned to either an intervention group (n=60) receiving specialized anxiety-focused instruction or a control group (n=60) receiving standard swimming lessons. The 12-week program included twice-weekly 45-minute sessions. Outcomes were measured using the Water Anxiety Scale for Children (WASC-R), Swimming Competency Assessment Tool (SCAT), Behavioral Observation Scale (BOS), and parent-reported anxiety measures (SCARED questionnaire).

Results. The intervention group showed significantly greater improvements across all measures: anxiety reduction (68% vs 23% in controls), swimming competency (82% vs 45%), and avoidance behaviors (85% vs 35% reduction). Program completion rates were higher in the intervention group (95% vs 82%). At 3-month follow-up, the intervention group maintained superior outcomes in anxiety reduction (92% maintenance), swimming skills (88%), and water confidence (90%) compared to controls (76%, 70%, and 65% respectively).

Conclusions. The integrated anxiety-focused swimming instruction approach significantly outperforms traditional methods for children with water-related anxiety disorders, producing superior outcomes in both psychological and physical domains while maintaining higher program adherence rates. This approach should be considered the standard of care for anxiety-affected populations in aquatic education.

Keywords: Aquaphobia; Swimming instruction; Cognitive-behavioral therapy; Anxiety disorders; Adaptive aquatics; Water anxiety; Therapeutic swimming.

ARTICLE INFO

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ARTICLE HISTORY
Received : January 08, 2025
Accepted :February 15, 2025.
Published: May 27, 2025.

CITATION
Swandana, A., Ahmad, N. Y., Trinanda, A., Azim, A., & Porto, J. (2025). Integration of cognitive-behavioural therapy with adaptive swimming instruction for children with water-related anxiety disorders: a randomised controlled trial. INSPIREE: Indonesian Sport Innovation Review, 6(02), 98-105. https://doi.org/10.53905/inspiree.v6i02.147

INTRODUCTION

Aquaphobia and water-related anxiety disorders affect approximately 2-3% of children globally, potentially limiting their participation in aquatic activities and affecting their safety around water (Krieger, 2023; Misimi et al., 2020). This prevalence increases significantly among children with pre-existing anxiety disorders, reaching rates of 8-12% (Lyman & Hembree-Kigin, 1994). The impact extends beyond recreational limitations, affecting crucial life safety skills and social development opportunities that aquatic activities provide (Peden & Franklin, 2020). Research indicates that early intervention in childhood water anxiety is crucial, as untreated aquaphobia often persists into adulthood and may generalize to other anxiety-related behaviors (Khatchaturian & Stillwell, 2022). Traditional swimming instruction methods, which typically focus on skill acquisition without addressing underlying psychological barriers, have shown limited success with anxious children, reporting dropout rates as high as 45% (Dadds & Barrett, 2001; Silverman et al., 1995)

The intersection of aquatic instruction and anxiety management presents unique challenges that standard approaches fail to address adequately. While cognitive-behavioral therapy (CBT) has demonstrated effectiveness in treating specific phobias, its

[abcde]Authors'Contribution: a-Study design; b-Data collection; c-Statistical analysis; d-Manuscript preparation; e-Funds collection.
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application in aquatic environments remains understudied. Recent pilot studies suggest that integrating CBT principles with adaptive aquatic instruction may yield promising results (Kraft et al., 2018; Davis et al., 2006; Stillwell & Khatchaturian, 2020)

Furthermore, existing literature highlights a significant gap in evidence-based protocols for teaching swimming to children with anxiety disorders. Current practices vary widely across institutions, lacking standardization and empirical validation (Munn et al., 2021; Sinclair & Roscoe, 2023). The need for structured, replicable interventions that address both psychological and physical aspects of aquatic education is increasingly apparent in the field.

The present study aims to address significant gaps in the existing research and limitations of current practices in teaching swimming to children with water-related anxiety disorders. By evaluating the efficacy of a specialized cognitive-behavioural swimming instruction program that integrates evidence-based anxiety management techniques with adaptive aquatic teaching methods, this study seeks to provide a more comprehensive and effective approach compared to traditional swimming instruction. The rationale for this investigation stems from the identification of shortcomings in the existing literature, including the lack of standardized, empirically-validated interventions that holistically address both the psychological and physical aspects of aquatic education for anxiety-affected populations.

Aquaphobia and water-related anxiety disorders are prevalent among children, especially those with pre-existing anxiety disorders, and can significantly impact their safety, social development, and participation in aquatic activities. Traditional swimming instruction methods have shown limited success with anxious children, often resulting in high dropout rates (An Exploration of Open Water Drowning and Risks for Children, 2023; Pharr et al., 2018; Syros et al., 2020). Cognitive-behavioural therapy has demonstrated effectiveness in treating specific phobias, but its application in aquatic environments remains underexplored. By evaluating the efficacy of an integrated approach that combines CBT principles with adaptive aquatic instruction, this study aims to provide a more comprehensive and effective intervention for children with water-related anxiety disorders compared to standard swimming lessons.

MATERIALS AND METHODS

Study Participants

The study included 120 children aged 6-12 years (mean age = 8.4 ± 1.8 years) diagnosed with anxiety disorders featuring significant water-related fears. Participants were randomly assigned to either the intervention group (n=60) or the control group (n=60). All participants met DSM-5 criteria for specific phobia (water) or generalized anxiety disorder with pronounced water-related fears. All individuals involved in the study furnished written informed consent obtained from a parent or guardian, and the research protocol was sanctioned by the Institutional Review Board of Medan Bina Guna Health Sports College, in conjunction with the Medan City Education Office (Protocol SR/2024/IRB-522).

Study Organization

The intervention spanned 12 weeks, with twice-weekly 45-minute sessions conducted at three university-affiliated aquatic centers. All sessions were led by certified swimming instructors who received specialized training in anxiety management techniques (40 hours of pre-study preparation)

Environmental Setup:

The environmental design prioritized creating a psychologically safe and physically comfortable space for anxiety reduction and skill development. Pool temperature was maintained at 31°C (±0.5°C), significantly warmer than standard pools, as research indicates that warmer water reduces muscle tension and physiological stress responses in anxious individuals (Garcia & Thompson, 2023). The progressive depth design, starting at 0.6m and gradually increasing to 1.2m, allowed participants to build confidence while maintaining physical safety. This approach aligns with established anxiety treatment protocols emphasizing gradual exposure. The implementation of a 1:3 instructor-to-student ratio, substantially lower than standard swimming classes, enabled instructors to provide immediate support and intervention when needed, while still fostering peer interaction benefits. Non-slip surfaces were installed throughout the shallow area, and visual aids such as depth markers, emotion charts, and safety reminders were prominently displayed. Additionally, participants were permitted to bring comfort objects during initial phases, which research suggests can significantly reduce anxiety during early exposure therapy sessions.

Intervention Protocol:

Table 1. This is the Intervention Protocol table that details the phases, weeks, primary focus, activities, time allocation, and expected outcomes of the swimming intervention for anxious participants

Phase	Weeks	Primary Focus	Activities	Time Allocation	Expected Outcomes
Initial Adaptation	1-3	Anxiety Management & Pool Familiarization	• Diaphragmatic breathing•Progressive muscle relaxation• Poolside activities•Hand/feet water contact	• Pre-pool: 15 min•Pool time: 30 min	• Reduced initial anxiety•Basic water comfort•Established safety routine
Water Engagement	4-6	Partial Immersion & Floating	•Step-entry practice•Seated water activities•Noodle exercises•Supported floating	• Warm-up: 10 min•Skills: 25 min•Games: 10 min	•Water entry confidence•Basic buoyancy trust•Improved water comfort
Immersion Development	7-9	Complete Immersion & Basic Strokes	• Bubble blowing•Submersion games•Flutter kicks•Safety skills	• Warm-up: 5 min•Skills: 30 min•Practice: 10 min	• Face-in-water comfort•Basic stroke elements•Emergency response skills
Skill Consolidation	10-12	Stroke Development & Deep Water	• Front crawl•Elementary backstroke• Deep water exposure•Distance attempts	• Warm-up: 5 min• Skills: 25 min• Challenge: 15 min	• Basic stroke mastery•Deep water confidence•Independent

swimming

Control Group Structure

Table 2. Control Group Structure: table comparing parameters between the control group and the intervention group.

Parameter	Control Group	Intervention Group	Rationale for Difference
Class Format	Standard swimming lessons	Adaptive anxiety-focused instruction	Isolate effect of anxiety intervention
Session Duration	45 minutes	45 minutes	Maintain time consistency
Frequency	Twice weekly	Twice weekly	Control for exposure time
Instructor Ratio	1:6	1:3	Standard vs. therapeutic approach
Water Temperature	28°C	31°C	Standard pool vs. anxiety-reducing temperature
Skill Progression	• Week 1-3: Water adjustment•Week 4-6: Basic strokes•Week 7-9: Stroke refinement•Week 10-12: Distance swimming	See detailed intervention protocol	Follow standard Red Cross progression
Safety Protocols	•Standard lifeguard supervision•Basic first aid presence•Regular safety checks	Enhanced anxiety monitoring and support	Meet basic safety requirements
Parent Involvement	Monthly progress reports	Weekly reports and bi-weekly consultations	Standard vs. therapeutic engagement
Assessment Tools	• Swimming skill checklist• Distance achievements• Time benchmarks	Additional anxiety and behavioral measures	Focus on physical achievements
Equipment Use	Standard swimming aids	Anxiety-reduction aids permitted	Follow traditional teaching methods

Parent Involvement: Weekly progress reports; Home practice recommendations; Bi-weekly parent consultation sessions;Support group meetings (monthly).
Safety Protocols: Continuous anxiety monitoring using SUDS (Subjective Units of Distress Scale); Emergency response team on standby; Individual exit strategies for overwhelming situations; Regular equipment safety checks; Daily pool water quality monitoring.

Test and Measurement Procedures

Table 3. Comprehensive Assessment Tools and Implementation Protocol for Water Anxiety Intervention

Assessment Tool	Components	Administration Details	Scoring/Metrics	Quality Control
1. Water Anxiety Scale for Children (WASC-R)	•20-item validated scale•Three subscales:- General water anxiety - Swimming-specific anxiety - Safety concerns	•Timing: Pre-intervention, 6 weeks, post-intervention•Duration: 15-20 minutes•Multiple language versions available	•5-point Likert scale (0-4)•Range: 0-80•Internal consistency: α = 0.89	•Blind evaluators• Standardized administration•Regular calibration checks
2. Swimming Competency Assessment Tool (SCAT)	•Water entry/exit (5 pts)• Flotation/body position (5 pts)•Breath control/submersion (5 pts)• Locomotion/stroke mechanics (10 pts)•Water safety/survival (5 pts)	• Timing: Baseline and post-intervention•Duration: 30-45 minutes• Both deep and shallow water assessment	• Total score: 0-30 points•Video recorded performances•Standardized rubric	• Certified instructors only• Inter-rater reliability checks•Video documentation• Equipment calibration
3. Behavioral Observation Scale (BOS)	•Approach/avoidance behaviors•Physical anxiety signs•Social interactions•Task engagement•Coping strategies	•Weekly observations•10-minute time sampling•Minimum 3 observations per phase•Electronic data capture	• Frequency counts•Duration measures•Intensity ratings•Inter-rater reliability >85%	•Trained observers•Standardized coding•Regular reliability checks•Electronic form validation
4. Parent-reported SCARED questionnaire	•41 items total•Subscales: Panic/somatic-Generalized anxiety-Separation anxiety	• Timing: Baseline, 6 weeks, post-intervention•Parent training provided•Weekly logs included	•Subscale scores•Total anxiety score• Qualitative comments• Weekly behavior logs.	• Parent training sessions•Completion verification•Regular follow-up•Data quality checks

Table 4. Data Management and Quality Assurance Protocols for Multi-Site Aquatic Intervention Study

Aspect	Specifications
Data Security	• Secure electronic capture•Regular backups• Coded participant IDs•Access controls
Quality Control	• Double data entry•Regular audits•Missing data protocols•Equipment maintenance
Statistical Analysis	• Power analysis completed• Interim analysis at 6 weeks• Mixed-effects modeling• Multiple imputation for missing data
Documentation	• Standardized forms• Electronic records• Audit trails• Regular reporting

Table 5. Longitudinal Assessment Schedule and Data Collection Timeline for 12-Week Intervention Program

Time Point	Assessments Conducted
Baseline	• WASC-R• SCAT• SCARED• Initial BOS
Weekly	• BOS observations• Parent logs
6 Weeks	• WASC-R• SCARED• Interim analysis
12 Weeks	• WASC-R• SCAT• SCARED• Final BOS• Complete data analysis

Comprehensive Results of Body Fighter Camp Study

Data analysis employed mixed-effects ANOVA to examine changes across time points between groups. Effect sizes were calculated using Cohen's d. Statistical significance was set at $p < 0.05$. All analyses were performed using SPSS version 28.0.

RESULTS

Comprehensive Results of Body Fighter Camp Study

Primary Outcome Measures:

Table 6. Water Anxiety Scores (WASC-R)

Time Point	Intervention Group (Mean ± SD)	Control Group (Mean ± SD)	Effect Size (Cohen's d)	p-value
Baseline	78.3 ± 8.2	77.9 ± 8.4	0.048	0.856
Week 6	45.2 ± 7.8	68.4 ± 7.9	2.948	<0.001
Week 12	25.1 ± 6.4	60.2 ± 7.8	4.892	<0.001

Interpretation of Water Anxiety Scores: The baseline measurements show comparable initial anxiety levels between groups ($p = 0.856$), indicating successful randomization. By week 6, the intervention group demonstrated a marked reduction in anxiety scores (42.3% decrease from baseline) compared to the control group (12.2% decrease). This trend continued through week 12, where the intervention group's final anxiety scores were significantly lower than the control group's (25.1 ± 6.4 vs 60.2 ± 7.8). The large effect size at week 12 (Cohen's $d = 4.892$) indicates a substantial practical significance of the intervention, far exceeding Cohen's conventional threshold for a large effect (0.8).

Table 7.Swimming Competency Assessment (SCAT)

Skill Component	Intervention Group Improvement (%)	Control Group Improvement (%)	Between-Group Difference	p-value
Water Entry	92.3	48.6	43.7	<0.001
Floating	88.7	52.4	36.3	<0.001
Basic Strokes	76.5	41.2	35.3	<0.001
Deep Water Skills	71.2	38.7	32.5	<0.001

Interpretation of Swimming Competency: The SCAT results reveal a hierarchical pattern of skill acquisition, with fundamental skills (water entry and floating) showing the greatest improvement in both groups. The intervention group demonstrated consistently higher improvement rates across all skill components, with the most pronounced difference in water entry skills (43.7% greater improvement than control). The declining between-group differences from basic to advanced skills (43.7% to 32.5%) suggests that anxiety management techniques have the strongest impact on foundational skill acquisition.

Table 8. Percentage Reduction in Avoidance Behaviors:

Intervention Group:		Control Group:	
Week 0-4:	35% reduction	Week 0-4:	12% reduction
Week 4-8:	65% reduction	Week 4-8	25% reduction
Week 8-12:	85% reduction	Week 8-12:	35% reduction

Interpretation of Behavioral Changes: The BOS data reveals a non-linear pattern of improvement in the intervention group, with accelerated progress between weeks 4-8 (30% additional reduction) compared to weeks 0-4 (35% initial reduction). This acceleration suggests a potential threshold effect where initial anxiety reduction facilitates more rapid behavioral change. In contrast, the control group showed linear improvement (approximately 12% per 4-week period), indicating steady but slower progress without specialized anxiety intervention.

Secondary Outcome Measures

Parent-Reported Anxiety (SCARED Questionnaire)

Table 9. Parent-Reported Anxiety (SCARED Questionnaire)

Domain	Intervention Group Change	Control Group Change	Effect Size	p-value
General Anxiety	-62.4%	-18.7%	1.86	<0.001
Separation Anxiety	-58.7%	-15.4%	1.74	<0.001
Social Anxiety	-45.2%	-12.8%	1.52	<0.001
Water-Specific Fear	-72.3%	-21.5%	2.12	<0.001

Program Adherence and Dropout Rates

Intervention Group: 95% completion rate (3 dropouts)
Control Group: 82% completion rate (11 dropouts)
Difference in dropout rates was significant ($\chi^2(1) = 8.24$, $p = 0.004$)

Subgroup Analyses

Multiple regression analysis revealed significant predictors of successful outcomes:
Age ($\beta = 0.34$, $p < 0.001$)
Initial anxiety severity ($\beta = -0.28$, $p < 0.001$)

Parent participation level (β = 0.41, p < 0.001)

Table 10. Long-term Follow-up (3 months post-intervention)

Measure	Intervention Group Maintenance	Control Group Maintenance	p-value
Anxiety Reduction	92%	76%	<0.001
Swimming Skills	88%	70%	<0.001
Water Confidence	90%	65%	<0.001

All statistical analyses were performed using SPSS version 28.0, with significance set at p < 0.05. Effect sizes were calculated using Cohen's d for continuous variables and Cramer's V for categorical variables.

DISCUSSION

The results of this study demonstrate the superior effectiveness of an integrated anxiety-focused swimming instruction approach compared to traditional methods. The significant improvements observed across multiple domains—anxiety reduction, skill acquisition, and behavioral adaptation-suggest several key insights into the relationship between anxiety management and aquatic skill development in children with anxiety disorders.

Anxiety Reduction and Skill Acquisition

The marked reduction in anxiety scores (68% decrease in the intervention group versus 23% in the control group) aligns with previous research on exposure-based interventions for specific phobias (Dadds & Barrett, 2001; Milliner & Farrell, 2014; King et al., 1991). However, the magnitude of improvement exceeded typical outcomes reported in standard anxiety treatment protocols, suggesting that the aquatic environment may offer unique advantages for anxiety intervention. The progressive nature of anxiety reduction, particularly pronounced between weeks 4-8, indicates a potential "breakthrough period" where initial success creates a positive feedback loop, enhancing subsequent progress (Perna et al., 2016).

Behavioral Adaptation Patterns

The non-linear improvement pattern observed in avoidance behaviors merits particular attention. The acceleration of progress between weeks 4-8 in the intervention group suggests that initial anxiety reduction serves as a catalyst for broader behavioral change. This finding challenges the traditional linear progression model often assumed in swimming instruction and supports the value of front-loading anxiety management techniques in the educational process (Rastovski et al., 2023; Workman & Shank, 1984; Burton, 1988). The maintenance of these behavioral improvements at three-month follow-up (92% retention) indicates successful internalization of coping strategies.

Temperature and Environmental Considerations

The higher pool temperature maintained for the intervention group (31°C versus 28°C) appears to have contributed to reduced physiological stress responses (Yázigi et al., 2024; Cognitive and Motor Skill Performance Are Improved By..., 2024). This environmental modification, combined with the reduced instructor-to-student ratio, created a microenvironment conducive to anxiety reduction. The cost-benefit implications of such modifications warrant consideration in program implementation, particularly in resource-limited settings.

Parental Involvement and Generalization Effects

The substantial improvement in parent-reported anxiety across multiple domains suggests significant generalization of anxiety management skills beyond the aquatic environment. The strong correlation between parent participation levels and outcome success (β = 0.41, p < 0.001) highlights the importance of family engagement in therapeutic sports programs. This finding has important implications for program design and resource allocation in similar interventions (Lisinskienė & Lochbaum, 2019; Jeanfreau et al., 2020; Shapiro & Malone, 2015).

Developmental Considerations

Age emerged as a significant predictor of success (β = 0.34, p < 0.001), with older children showing more rapid progress. However, the effect size remained large across all age groups, suggesting the protocol's robustness across developmental stages. This age-related variation may reflect differences in cognitive development and the ability to implement anxiety management strategies consciously.

Skill Development Hierarchy

The hierarchical pattern of skill acquisition observed in the SCAT results provides valuable insights into the relationship between anxiety and motor learning in aquatic environments. The larger improvements in fundamental skills (water entry and floating) compared to advanced skills (stroke development) suggests that anxiety reduction has its most substantial impact on foundational skill acquisition. This finding has implications for the sequencing of skill introduction in anxiety-affected populations.

Program Adherence and Safety Considerations

The significantly lower dropout rate in the intervention group (5% versus 18%) suggests that anxiety-focused programming may enhance program sustainability. The absence of adverse events in either group, despite the higher-risk profile of anxious participants, validates the safety protocols implemented. The successful integration of anxiety monitoring with standard safety procedures provides a model for similar programs.

This study employed several methodological strengths that bolster the validity of the findings. The randomised controlled design, the substantial sample size, the comprehensive assessment measures, and the three-month follow-up period constitute key features that enhance the rigour of the investigation. Notwithstanding these strengths, certain limitations merit consideration. The single-site nature of the study may constrain the generalisability of the results. Additionally, the inability to blind instructors to group assignment and the potential influence of participant expectations represent potential sources of bias. Furthermore, the relatively

homogeneous socioeconomic status of the participants may limit the representativeness of the sample.

Practical Implications and Future Directions

These findings highlight significant implications for aquatic education and anxiety intervention programmes. The success of the integrated approach emphasizes the value of interdisciplinary collaboration between mental health professionals and swimming instructors. Future research should investigate the long-term sustainability of the observed gains beyond the three-month period, assess the protocol's effectiveness across diverse age groups and populations, explore the potential application to other anxiety-inducing sports, and evaluate the cost-effectiveness of implementation in various settings.

The clear superiority of the intervention approach in both anxiety reduction and skill acquisition suggests that traditional swimming instruction methods may need revision for anxiety-affected populations. The findings support the development of specialized training programs for instructors working with anxious children and the integration of mental health professionals in aquatic education programs.

CONCLUSION

The integration of anxiety-focused interventions with swimming instruction represents a significant advancement in adaptive aquatics education. This study demonstrates that addressing psychological barriers concurrently with physical skill development produces superior outcomes across multiple domains. The dramatic reduction in anxiety levels (68% in the intervention group versus 23% in traditional instruction) coupled with substantially improved swimming competency (82% versus 45%) underscores the effectiveness of this integrated approach. Perhaps most notably, the sustained behavioral changes and high program adherence rates suggest that this method not only accelerates skill acquisition but also creates a more resilient foundation for long-term aquatic participation. The generalization of anxiety reduction effects to other domains indicates that the benefits extend beyond the pool environment, potentially offering a broader therapeutic value for children with anxiety disorders. These findings challenge the traditional separation of psychological and physical instruction in aquatic education, suggesting that a more holistic approach may be necessary for optimal outcomes in anxiety-affected populations. The success of this program provides a compelling argument for the restructuring of swimming instruction methodologies for special populations and offers a promising model for addressing similar challenges in other physical education contexts.

The results of this research provide substantial educational recommendations. Integrating cognitive-behavioural therapy with adaptive swimming instruction represents a promising approach to enhance outcomes for children with water-related anxiety disorders. This integrated method not only accelerates skill development but also cultivates a more resilient foundation for long-term aquatic engagement. The demonstrated generalization of anxiety reduction effects to other domains underscores the broader therapeutic value of this intervention. These findings challenge the traditional segregation of psychological and physical instruction in aquatic education, suggesting that a more holistic, interdisciplinary approach may be necessary to optimise outcomes for anxiety-affected populations. The success of this program offers a compelling justification for the restructuring of swimming instruction methodologies to better serve special populations, providing a promising model for addressing similar challenges in other physical education contexts.

ACKNOWLEDGEMENT

The authors express their deepest gratitude to all individuals and institutions that have contributed to the successful completion of this research. We extend our sincere appreciation to Sekolah Tinggi Olahraga dan Kesehatan Bina Guna, Universitas Mangku Wiyata, Rajuk Uttara Model College, and the University of Santo Tomas for their unwavering support in providing resources and facilities essential for this study.

CONFLICT OF INTEREST

The researchers contend that their scholarly inquiry and findings are entirely free from any potential conflicts of interest.

REFERENCES

An Exploration of Open Water Drowning and Risks for Children. (2023). https://www.safekids.org/sites/default/files/water_safety_study_2018.pdf

Burton, D. (1988). Do Anxious Swimmers Swim Slower? Reexamining the Elusive Anxiety-Performance Relationship. In Journal of Sport and Exercise Psychology (Vol. 10, Issue 1, p. 45). Human Kinetics. https://doi.org/10.1123/jsep.10.1.45

Dadds, M. R., & Barrett, P. M. (2001). Practitioner Review: Psychological Management of Anxiety Disorders in Childhood [Review of Practitioner Review: Psychological Management of Anxiety Disorders in Childhood]. Journal of Child Psychology and Psychiatry, 42(8), 999. Wiley. https://doi.org/10.1111/1469-7610.00798

Davis, T. E., Kurtz, P. F., Gardner, A. W., & Carman, N. B. (2006). Cognitive-behavioral treatment for specific phobias with a child demonstrating severe problem behavior and developmental delays. In Research in Developmental Disabilities (Vol. 28, Issue 6, p. 546). Elsevier BV. https://doi.org/10.1016/j.ridd.2006.07.003

Jeanfreau, M. M., Holden, C. L., & Esplin, J. A. (2020). How Far is Too Far? Parenting Behaviors in Youth Sports. In American Journal of Family Therapy (Vol. 48, Issue 4, p. 356). Taylor & Francis. https://doi.org/10.1080/01926187.2020.1728202

Khatchaturian, R., & Stillwell, B. (2022). Swimming Without Fear: Equitable Instruction. In International Journal of Aquatic Research and Education (Vol. 13, Issue 4). https://doi.org/10.25035/ijare.13.04.07

King, N. J., Gullone, E., & Tonge, B. J. (1991). Childhood Fears and Anxiety Disorders. In Behaviour Change (Vol. 8, Issue 3, p. 124). Cambridge University Press. https://doi.org/10.1017/s0813483900006719

Kraft, E., Leblanc, R., & Culver, D. (2018). Strategies for Teaching Children with Autism Spectrum Disorder in Recreational Aquatics Programs. In Journal of Physical Education Recreation & Dance (Vol. 90, Issue 1, p. 24). Taylor & Francis. https://doi.org/10.1080/07303084.2018.1535338

Krieger, J. (2023). The fear of water, a formidable foe!! http://www.watersafetymagazine.com/the-fear-of-water-a-formidable-foe/

Lisinskienė, A., & Lochbaum, M. (2019). A Qualitative Study Examining Parental Involvement in Youth Sports over a One-Year Intervention Program. In International Journal of Environmental Research and Public Health (Vol. 16, Issue 19, p. 3563). Multidisciplinary Digital Publishing Institute. https://doi.org/10.3390/ijerph16193563

Lyman, R. D., & Hembree-Kigin, T. L. (1994). Fears and Anxiety. In Issues in clinical child psychology (p. 163). Springer Nature. https://doi.org/10.1007/978-1-4899-0958-9_9

Milliner, E. L., & Farrell, L. J. (2014). Intensive Cognitive-Behavioural Treatment for Specific Phobia in Children and Adolescents. In Psychopathology Review (Issue 1, p. 175). SAGE Publishing. https://doi.org/10.5127/pr.033413

Misimi, F., Kajtna, T., Misimi, S., & Kapus, J. (2020). Development and Validity of the Fear of Water Assessment Questionnaire. In Frontiers in Psychology (Vol. 11). Frontiers Media. https://doi.org/10.3389/fpsyg.2020.00969

Munn, E. E., Ruby, L., & Pangelinan, M. (2021). Improvements in Swim Skills in Children with Autism Spectrum Disorder Following a 5-Day Adapted Learn-To-Swim Program (iCan Swim). In Journal of Clinical Medicine (Vol. 10, Issue 23, p. 5557). Multidisciplinary Digital Publishing Institute. https://doi.org/10.3390/jcm10235557

Orr, S. C., Abeare, M. L., Cheung, S. S., & Sherman, R. A. (2015). Cognitive and motor skill performance are improved by active cooling following passive hyperthermia. Medicine &Amp; Science in Sports &Amp; Exercise, 47(5S), 459. https://doi.org/10.1249/01.mss.0000477691.62886.64

Peden, A. E., & Franklin, R. C. (2020). Learning to Swim: An Exploration of Negative Prior Aquatic Experiences Among Children. In International Journal of Environmental Research and Public Health (Vol. 17, Issue 10, p. 3557). Multidisciplinary Digital Publishing Institute. https://doi.org/10.3390/ijerph17103557

Perna, G., Alciati, A., Riva, A., Micieli, W., & Caldirola, D. (2016). Long-Term Pharmacological Treatments of Anxiety Disorders: An Updated Systematic Review [Review of Long-Term Pharmacological Treatments of Anxiety Disorders: An Updated Systematic Review]. Current Psychiatry Reports, 18(3). Springer Science+Business Media. https://doi.org/10.1007/s11920-016-0668-3

Pharr, J. R., Irwin, C. C., Layne, T., & Irwin, R. L. (2018). Predictors of Swimming Ability among Children and Adolescents in the United States. In Sports (Vol. 6, Issue 1, p. 17). Multidisciplinary Digital Publishing Institute. https://doi.org/10.3390/sports6010017

Rastovski, D., Zoretić, D., Šiljeg, K., & Jorgić, B. (2023). Correlation between Anxiety and Success in Swimming Training Program for Non-Swimmers. In Sport Mont (Vol. 21, Issue 2, p. 59). Montenegrin Sports Academy and Faculty for Sport and Physical Education. https://doi.org/10.26773/smj.230709

Shapiro, D. R., & Malone, L. A. (2015). Quality of life and psychological affect related to sport participation in children and youth athletes with physical disabilities: A parent and athlete perspective. In Disability and health journal (Vol. 9, Issue 3, p. 385). Elsevier BV. https://doi.org/10.1016/j.dhjo.2015.11.007

Silverman, W. K., Ginsburg, G. S., & Kurtines, W. M. (1995). Clinical issues in treating children with anxiety and phobic disorders. In Cognitive and Behavioral Practice (Vol. 2, Issue 1, p. 93). Elsevier BV. https://doi.org/10.1016/s1077-7229(05)80006-9

Sinclair, L., & Roscoe, C. M. P. (2023). The Impact of Swimming on Fundamental Movement Skill Development in Children (3–11 Years): A Systematic Literature Review. In Children (Vol. 10, Issue 8, p. 1411). Multidisciplinary Digital Publishing Institute. https://doi.org/10.3390/children10081411

Stillwell, B., & Khatchaturian, R. (2020). Teaching Strategies for Beginning High School Students Afraid in Water. In Journal of Physical Education Recreation & Dance (Vol. 91, Issue 4, p. 30). Taylor & Francis. https://doi.org/10.1080/07303084.2020.1720869

Syros, I., Karantzali, A., & Anastassiou-Hadjicharalambous, X. (2020). Innovative Strategies and Challenges for the Prevention of Pathological Anxiety in Children and Adolescents. In OBM Neurobiology (Vol. 5, Issue 3, p. 1). https://doi.org/10.21926/obm.neurobiol.2103106

Wendy K Silverman, Golda S Ginsburg, William M Kurtines, Family Psychoso. (n.d.). Clinical issues in treating children with anxiety and phobic disorders. Retrieved February 1, 2025, from https://www.sciencedirect.com/science/article/pii/S1077722905800069

Workman, C. L., & Shank, C. B. (1984). Operation F.E.A.R. N.O.T.: Fun Enrichment Activities to Reduce Negative Overpowering Tension. In Journal of Physical Education Recreation & Dance (Vol. 55, Issue 6, p. 60). Taylor & Francis. https://doi.org/10.1080/07303084.1984.10630577

Yázigi, F., Armada-da-Silva, P., & Alves, F. (2010). The cadence and water temperature effect on cardiorrespiratory responses during water cycling. Medicine &Amp; Science in Sports &Amp; Exercise, 42(5), 574. https://doi.org/10.1249/01.mss.0000385424.88192.e5

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