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## Parental Perceptions of Water Safety among Children with Autism Spectrum Disorders

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### Abstract

Children with autism spectrum disorders (ASD) are twice as likely to die from unintentional drowning compared to same-age children without ASD emphasizing the importance of water-safety skills and knowledge. Yet little research has been published on perceptions of water safety for this population. The objective of the study was to investigate parental perceptions of water safety amongst children with ASD. An online questionnaire focusing on parental perceptions of water safety was distributed to parents of children with ASD associated with autism support groups across Canada. Forty-nine parents completed the self-report questionnaire with items related to demographics, swimming proficiency and lessons, adult supervision, and emergency safety procedures. Most parents (70%) believed that swimming ability was more important than supervision in ensuring water safety amongst children with ASD. Results highlighted discrepancies between reported and actual knowledge of emergency resuscitation procedures amongst parents of children with ASD. Parents of children with ASD may underestimate the importance of supervision and overestimate the role of swimming proficiency in ensuring the safety of children with ASD in aquatic environments. Future studies may benefit from exploring ways to promote effective strategies for encouraging water safety in this population.

*Keywords:* water safety, autism spectrum disorder (ASD), parental perceptions, swimming proficiency, drowning prevention

### Introduction

Autism spectrum disorders (ASD) have been characterized as pervasive neurological disorders marked by deficits in social communication and interaction, as well as the presence of repetitive, stereotyped, and restrictive behaviors and interests (Diagnostic and Statistical Manual of Mental Disorders-V, 2013). Individuals with ASD may become over-stimulated, sometimes leading to self-harm or aggression and, in almost half the population, an increased likelihood for wandering or elopement (Kane & Mazurek, 2011).

Physical activity has been found to offer therapeutic benefits for individuals with ASD (Sowa & Meulenbeek, 2012). Preliminary research suggested that swimming, in particular, promoted positive physical, social, and behavioural benefits for children with ASD (Alaniz et al., 2017; Fragala-Pinkham et al., 2011; Hulls et al., 2006; Lee & Poretta, 2013; Pan, 2010). The risk for elopement, seizures, and certain difficulties adapting to new environments suggest that aquatic activities are not without risk for children with ASD (MacTavish, 2001). Indeed, statistics show unintentional drowning to be the leading cause of accidental death for children with ASD under the age of 14 (Grosse, 2014). Children and adults with ASD who often developed an unusual fascination with water remained twice as

likely to drown compared to peers without ASD with boys particularly at-risk (Schendel et al., 2016). Research indicated children with ASD frequently sustained situations of 'near drowning' even in relation to much smaller bodies of water including household pools, ponds and bathtubs (Kemp & Sibert, 1994; Martin & Dillenburger, 2019). Guan and Li's (2017) findings suggested that 74% of all reported cases of fatal drowning in this population involved wandering to unsupervised bodies of water often within 1000m of a victim's home.

Given these startling statistics, it seems critical to implement and support evidence-based water-safety procedures for children with ASD and their families (Martin & Dillenburger, 2019). Researchers have defined safety skills as 'preventative or reactionary verbal or non-verbal behaviours that establish or maintain the safety of a person' (Akmanoglu & Tekin-Iftar, 2011, p. 206). Martin and Dillenburger's systematic review explained that preventative water safety skills refer to an understanding of how to enter and exit bodies of water and an understanding of flotation devices. Conversely, reactionary skills consist of knowing how to re-surface following submersion in water or an understanding of how to reach the side. Swim skills sometimes associated with water safety include the capability return to the surface after submersion, float, tread water, and perform swim strokes on back or front effectively across set distances.

Yet recent studies have questioned the role swimming lessons and skill alone play in mitigating the risk for drowning in children without ASD (Moran & Stanley, 2006). Indeed, certain water safety skills clearly move beyond swimming (Guan & Li, 2017). These involve knowing the importance of not swimming alone (e.g. with a partner and/or under supervision of adults), following signs and not running on slippery surfaces in close proximity to bodies of water (Martin & Dillenburger, 2019). Certain aquatic research has emphasized that it is supervision around water environments that remains critical in ensuring water safety amongst children given the unpredictability and implicit risks associated with open bodies of water (Brenner et al., 2003; Grosse, 2014). To this end, parental perceptions of water safety have been found to be a potential indicator of how much importance adults place on supervising children near water. Worryingly, research has shown that certain parents, even of children without ASD, underestimate the importance of supervision in favour of an over-reliance on skills taught in swimming lessons (Moran & Stanley, 2006). Despite the evidence that parental misconceptions and lack of knowledge may play a role in reducing water safety for children, limited research has investigated parental perceptions amongst families of children with ASD who are at heightened risk for unintentional drowning (Guan & Li, 2017). Therefore, the purpose of this study was to investigate parental perceptions and knowledge of water safety for children with ASD.

## **Method**

### **Participants**

Following institutional research ethics approval, researchers requested permission from autism network organizers across Canada to recruit a convenience sample of parents of children with ASD (3-14 years old) to participate in the study. Forty-nine parents completed an online self-report questionnaire distributed anonymously through email. Participants were excluded from the study if they were non-English speaking and/or did not have children with ASD (aged between 3-14 years). Parent participants reported having children with ASD including 8 girls and 41 boys with a mean age of 9.5 years. Thirty children were Caucasian, one was Asian, one was Euro-Asian while 17 preferred not to report their race/ethnicity.

### **Materials and Design**

The online survey represented a modified version of a questionnaire used by Moran and Stanley (2006) when investigating parental perceptions of water safety and supervision in toddlers without ASD. The survey combined open-ended and multiple-choice questions regarding participant demographics, emergency resuscitation procedures, swimming skill/lessons, and water supervision. Participant responses were derived from responses to statements using a five-point likert scale. Moran and Stanley's (2006) research did not report the initial reliability and validity of their survey; therefore, a pilot study, featuring 10 parents of children with ASD, was carried out prior to this study to gain input including positive and negative comments on the questionnaire with particular focus on autism-specific content and the removal any redundant items.

### **Data Analysis**

All data were entered through the Qualtrics survey platform. Descriptive statistics were calculated for each of the demographic items and parental knowledge statements.

## **Results**

Table 1 outlines parental responses to questions regarding water safety for children with ASD. According to 82% of participants, safety was the primary reason for enrolling their child in swim lessons. The majority of participants (68%) believed that children with ASD drown because they haven't learned to swim. Parents believed (85%) that the earlier a child with ASD learns to swim, the safer he/she will be. Parents (87%) mostly stated that swimming lessons are the best way to prevent children with ASD from drowning. The majority somewhat agreed (34%) or strongly agreed (37%) that it is better for children with ASD to develop swimming skills as opposed to relying on adult supervision around water. Just under one-third of participants (32%) claimed that it was not possible to constantly supervise their child around water at home.

**Table 1**

*Parents' perceptions of water safety and supervision around aquatic environments*

<u>Statement</u>	<u>Percentage Agree</u>	<u>Percentage Disagree</u>	<u>Percentage neither Agree nor Disagree</u>
At home its is not possible to constantly supervise your child around water	32%	57%	11%
Children with ASD drown because they haven't learned to swim	68%	11%	21%
The earlier children with ASD learn to swim, the safer they will be	85%	2%	13%
Swimming lessons are the best way to prevent children with ASD from drowning	87%	13%	0%
It is better for children with ASD to develop swimming ability than relay on adult supervision	71%	19%	11%
Safety is the main reason children with ASD should be enrolled in swimming lessons	82%	9%	9%
Children with ASD should be enrolled in swimming lessons so they can save themselves if they fall into the water	87%	9%	4%

Most parents (76%) reported having undertaken cardiopulmonary resuscitation (CPR) training within the previous five years. Forty-one percent of parents felt confident or very confident in their ability to perform emergency on their child with ASD. Fewer parents (29%) reported the correct compression to breathe ratio for emergency CPR.

### Discussion

The purpose of this research was to examine perceptions of water safety amongst parents of children with ASD. Preliminary results indicated that parents believed swimming skills/lessons play a more important role than adult supervision in ensuring water safety and preventing drowning amongst children with ASD. The majority of parents thought that the earlier a child with ASD learns to swim then the safer he/she will be around bodies of water. Findings also displayed discrepancies between reported and actual knowledge of emergency resuscitation procedures amongst parents of children with ASD.

Parents of children with ASD strongly agreed (87%) that their child should be enrolled in swimming lessons in order to promote safety and to save him/her from drowning. Furthermore, most parents insisted that it was more important to develop swimming ability rather than provide close supervision for a child with ASD around water (70%). Indeed, only 32% of parents believed it possible to constantly supervise their child with ASD near water. These findings worryingly concur with previous research conducted by Moran and Stanley (2006) which showed parents of toddlers also prioritized the importance of learning to swim over adult supervision when attempting to reduce the risk of drowning. Although swimming skills are important to develop (Martin & Dillenburger, 2017), this approach to water safety amongst parents may promote false expectations and sense of security in aquatic environments leading to elevated risk for adverse events involving children with ASD (Grosse, 2014; Guan & Li, 2017). Swimming lessons may teach the locomotive skills used to swim to survive; however, swimming ability is not always an accurate indication of a child's respective risk for drowning with many victims reported to be average to good swimmers (Brenner et al., 2003).

### **Implications**

As such, results indicated that parents of children with ASD did not necessarily follow best practice guidelines which emphasize the value of constant supervision around water rather than focusing on swimming proficiency alone (Grosse, 2014). Given the high prevalence of unintentional drowning and accidental death amongst children with ASD, it seems critically important to provide further concomitant education to parents and practitioners in order to promote increased water safety in this population. This is especially true given the prevalence of wandering, seizures, and impaired ability to assess risk and adapt to changing environments (Schendel et al., 2016). This change of approach does not entail deterring parents from enrolling children with ASD in swimming lessons but rather shifting the focus of swimming lessons from swimming-as-drowning-prevention to the benefits associated with swimming and emphasizing the critical importance of supervision not only around water but any environment where it is possible a child might come into contact with water environment while wandering (Moran & Stanley, 2006). A recent systematic review emphasized that more thorough research is necessary in

order to establish the most appropriate intervention methods to promote water-safety skills and drowning prevention education to families with ASD. Any approach should include both preventative and reactionary water safety knowledge that moves beyond swimming alone (Martin & Dillenburger, 2019). This could include the promotion of several mechanisms that reduce the likelihood of children with ASD eloping, and, thereby, accessing water environments unsupervised. Recommended strategies might include safety plans (Autism Speaks, 2020: [https://www.autismspeaks.org/creating-safety-plans-people-autism?utm\\_source=email&utm\\_medium=text-link&utm\\_campaign=espeaks](https://www.autismspeaks.org/creating-safety-plans-people-autism?utm_source=email&utm_medium=text-link&utm_campaign=espeaks)), securing the home (locks, fences, alarms), ID bracelets, GPS tracking devices and/or alarms (Anderson et al., 2012). It is also important to highlight the dangers associated with bodies of water anywhere in the neighborhood to home whether it be pools, lakes, ponds, and/or other bodies of water where many drownings occur (Guan & Li, 2017).

Results of our survey showed that three-quarters of parents reported undertaking CPR training within the last five years. These findings are encouraging because familiarity with emergency procedures along with emphasis on close supervision may help increase reactive water safety for families of children with ASD. Indeed, caregiver knowledge of CPR may mean the difference between life and death in certain situations (Moran et al., 2012). It was disconcerting that fewer than a third of parents who had completed the training knew the correct compression to breathe ratio for emergency CPR when asked. Moving forward, any water safety guidelines for children with ASD may benefit from including a component focusing on emergency training and also safety devices.

### **Limitations**

Results should be read with caution due to the relatively small sample which may have limited the ability to generalize findings to a wider population. Moreover, results of this study were subject to the inherent bias associated with self-reported data. Furthermore, authors did not examine and calculate the validity and reliability coefficients of the adapted questionnaire which may limit the ability to draw conclusions from results. Nonetheless, this study offers an important starting point for further discussion concerning water safety amongst children with ASD who face elevated possibilities for unintentional drowning compared to peers without ASD.

### **Conclusion**

Findings identified possible misconceptions amongst parents of children with ASD regarding water safety. Our findings appeared to indicate that parents may hold an overly optimistic view of the importance of swimming proficiency in reducing the risk of drowning in this population. With increasing rates of children diagnosed with ASD, it is important that every precaution possible must be taken with respect

to promoting water safety in pediatric populations. Therefore, in addition to promoting close supervision around water, researchers and practitioners might seek to implement more effective strategies that incorporate parental education into broad water safety initiatives for families of children with ASD.

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