

Impact of COVID-19 Pandemic on Toddler Swimming Routines

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Abstract Swimming is a common pastime and important developmental activity for toddlers. The aim of this research was to explore changes in swim routines for toddlers due to the COVID-19 pandemic. An online survey asked 448 caregivers of toddlers about changes they made to their swimming routine due to the pandemic. Many participants reported swimming less often and delaying swimming lessons for their toddlers. Compared with typical routines, during the pandemic, there were significant differences in how often caregivers swam with their toddler and in the percentage of caregivers who reported swimming with their toddler in open water, at public pools, and at friends' or relatives' pools, but not in home pools. Results highlight a reduction in access to water, swimming opportunities, and swimming lessons for toddlers as a result of COVID-19. Future research should identify long-term consequences the changes may have on water familiarity and competency, physical activity, and drowning risk.

Keywords: fitness, health behavior, injury management, youth, physical activity

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1. Introduction

Swimming and other recreational water activities are common pastimes for many people, especially during summer months. Research on rehabilitation shows that people prefer exercising in the water compared with on land. [1] In the United States (U.S.), swimming is the fourth most popular sports activity. [2] Many people start getting used to being in water as young children, becoming familiar with water through informal excursions to pools or open water like lakes, rivers, and beaches.

Children also start to develop water competency and comfort through formal water familiarization and swimming classes. The American Academy of Pediatrics recommends that children start swimming lessons as early as 1 year old. [3] During swimming lessons, children learn skills such as entering the water, returning to the surface, turning around, propelling oneself for at least 25 yards, floating on or treading water, and exiting the water. [4] Research shows that toddlers demonstrate improved skills at the end of a course of swimming lessons. [5] Learning swim skills before the age of five is also associated with developmental advantages beyond water competency, such as faster physical and cognitive skill development in a number of realms. [6]

Drowning is the leading cause of unintentional injury death for children 1-4 years old. [7] While learning to swim does not make someone "drown proof", learning how to become water competent through formal swimming lessons can become a life-saving skill. [3] Learning how to swim is an important layer of protection against drowning. Research has found that participating in formal swimming lessons can reduce the risk of drowning for children 1-4 years old. [8]

In 2020, many summer plans were affected by the COVID-19 pandemic. On February 3, 2020, the U.S. declared a Public Health Emergency due to the coronavirus outbreak. Starting on March 19th, 2020, states began issuing orders restricting non-essential services. [9] For many areas of the U.S., limitations were put on swimming pools, gyms, some open water locations, and waterparks. Personal safety concerns, closed businesses, and governmental restrictions limited people's access to many water-related activities, including swimming and swimming lessons.

Due to the important place swimming holds in many people's lives and the critical time frame for toddlers to develop comfort in the water and start swimming lessons, changes in swimming routines could have long-term consequences. The purpose of this study was to overview changes that occurred in swimming routines for toddlers in the U.S. as a result of the COVID-19 pandemic.

2. Materials and Methods

A cross-sectional study was conducted in August, 2020. A convenience sample of caregivers of toddlers were recruited using the online Amazon MTurk platform. MTurk workers who lived in the U.S. and had a 95% or higher MTurk approval history could view the recruitment information asking for caregivers of toddlers to complete a survey. Participants were only allowed to access the survey if they answered that they were over 18 years old and were the caregiver for a toddler (1-4 years old). Participants were paid \$2 for completing the anonymous survey. The study was approved by the University of Texas at Austin Health Sciences Institutional Review Board. Participants reviewed and agreed to an informed consent document before starting the survey. The survey asked about the background and demographics of the caregiver and toddler and about their swimming routines at the time they took the survey, which was during the COVID-19 pandemic. The survey also asked what their swimming routines would be if they were not impacted by the COVID-19 pandemic.

The survey was tested on caregivers of toddlers prior to use in the larger sample. To ensure high quality data from the MTurk survey takers, a score was created that summed a number of poor data quality indicators, such as a completion time of less than 5 min, nonsensical textbox answers, and contradictory answers on multiple choice questions. Surveys with a poor quality indicator score were not included in the analyses. Data were analyzed using STATA SE version 12.0. To compare distribution for paired data, McNemar’s test was used to analyze differences in swim frequency and swim location responses during the COVID-19 pandemic and what swim routines would be if there were no restrictions due to the pandemic.

3. Results

Results were analyzed for 448 participants. Most of the participants in the survey were parents/foster parents/step-parents of a toddler (86%). The majority of participants were 25 - 34 yrs old (54%), male (61%), had a

household income of \$50,000-\$99,999 (50%), had a bachelor's degree (61%), and reported their race to be white (73%) (Table 1). Toddlers the participants cared for ranged in age, with similar percentages of 1-2 yr olds (31%), 3 yr olds (37%), and 4 yr olds (32%) (Table 2).

Table 1. Caregiver Background and Demographic Information

Characteristic	Category	n	%
Gender	Female	176	39.3
	Male	272	60.7
Age	18-24 yrs	13	2.9
	25-34 yrs	243	54.2
	35-44 yrs	148	33
	45-54 yrs	28	6.3
	55 yrs or more	16	3.6
Race/ethnicity	White	325	72.5
	Black	62	13.8
	Hispanic/latino	27	6.0
	Asian	15	3.4
	Mixed race	19	4.2
Income	Less than \$25,000	35	7.8
	\$25,000-\$49,999	123	27.5
	\$50,000-\$99,999	225	50.2
	\$100,000-\$199,999	55	12.3
	\$200,000 or more	10	2.2
Education	High school or less	32	7.1
	Some college	70	15.6
	Bachelor's degree	274	61.2
	Advanced degree	72	16.1
Have a home pool	No	301	67.2
	Yes	147	32.8
Relationship	Parent/step/foster	383	85.5
	Grandparent	30	6.7
	Aunt/uncle/cousin	25	5.6
	Older sibling	10	2.2

Table 2. Toddler Demographic Information

Characteristic	Category	n	%
Gender	Female	156	34.8
	Male	292	65.2
Age	1 yr	38	8.5
	2 yrs	102	22.8
	3 yrs	165	36.8
	4 yrs	143	31.9

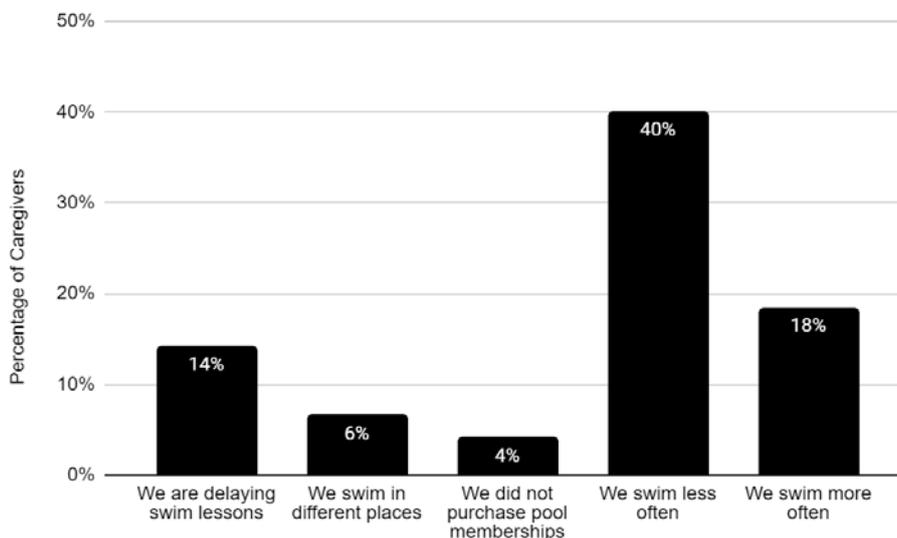


Figure 1. Changes in swim routines during COVID-19 pandemic

3.1. Swim Routines

Twenty-two percent of participants reported making no changes to their swim routine. Seventy-eight percent of participants reported making one or more changes to their normal swimming routines as a result of the COVID-19 pandemic (Figure 1). The most common change was swimming less often (40.0%), but some changed their routine to swim more often (18.3%). Other changes included delaying swim lessons (14.1%), swimming in different places (6.5%), and not purchasing pool memberships (4.0%).

3.2. Swim Frequency

There were differences in swim frequency during COVID-19 compared to normal routines (Figure 2). During COVID-19, significantly more people never swam with their toddler ($\chi^2(1, N=448) = 66.57, p<0.001$); significantly fewer people swam with their toddler a few times a summer ($\chi^2(1, N=448)=9.19, p=0.0024$) and a few

times a week ($\chi^2(1, N=448)=8.33, p=0.0039$). There were no differences in how many participants swam with their toddler most days ($\chi^2(1, N=448)=0.40, p=0.5271$) or a few times a month ($\chi^2(1, N=448)=2.75, p=0.0975$).

Of all caregivers surveyed, 45.5% reported the same swim frequency during the pandemic compared with their normal swim routines, 40.2% decreased their swim frequency, and 14.3% increased their swim frequency.

3.3. Swim Location

The number of participants swimming with their toddler at their home pool stayed about the same during COVID-19 compared with their normal routine ($\chi^2(1, N=448) = 0.14, p=0.7055$) (Figure 3). During COVID-19, fewer participants swam in friend's or relative's pools ($\chi^2(1, N=448)=10.32, p=0.0013$) and in open water ($\chi^2(1, N=448)=8.32, p=0.0039$). The greatest change in swim location was that about half as many participants swam in public, apartment, or community pools during COVID-19 ($\chi^2(1, N=448) = 67.85, p<0.001$).

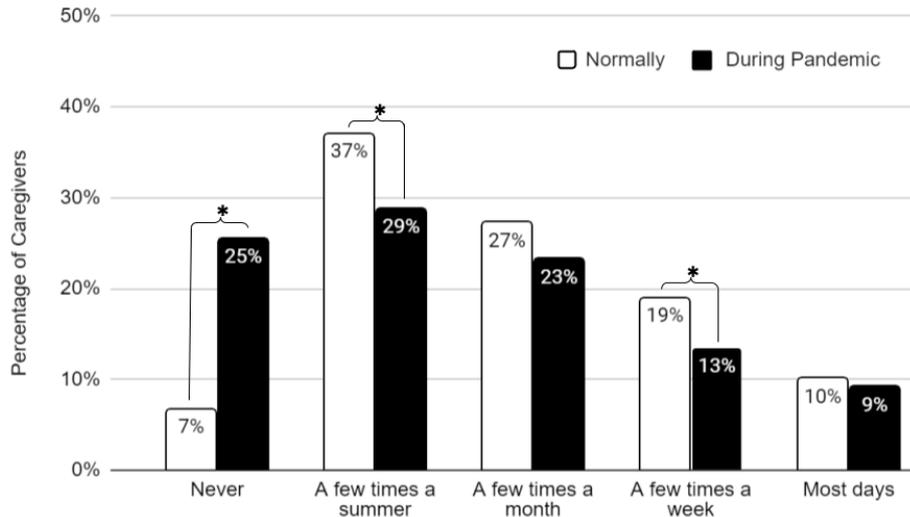


Figure 2. Normal swim frequency and during COVID-19 pandemic (Note: * denotes pairwise comparisons significant at $p<0.05$)

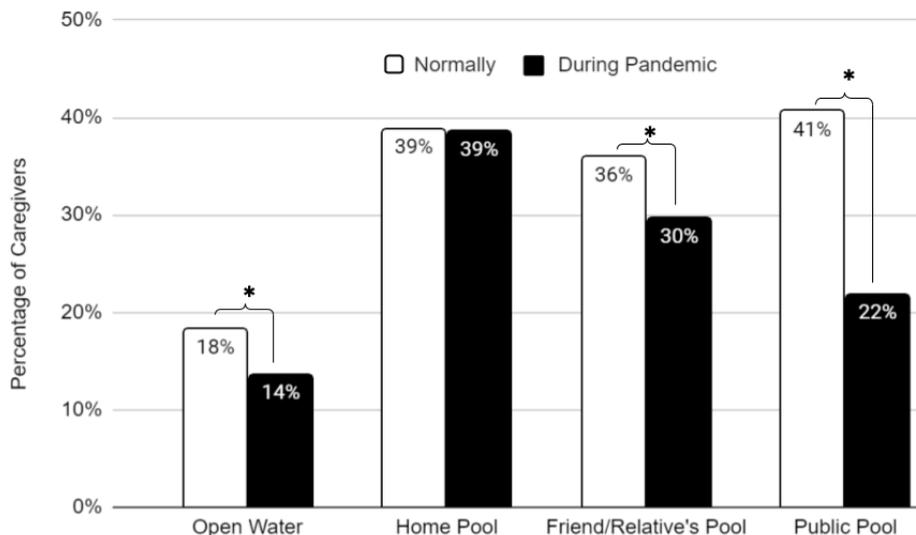


Figure 3. Normal swim locations and during COVID-19 pandemic (Note: * denotes pairwise comparisons significant at $p<0.05$)

4. Discussion

This study shows that there were a number of important changes made to swimming routines during the COVID-19 pandemic, with the overall trend of reducing the frequency that toddlers swam. Additionally, although the use of home pools remained the same, the COVID-19 pandemic was associated with reduced access to or use of public pools, open water, and private pools of friends or relatives. Additionally, the pandemic led many caregivers to delay swimming lessons for their toddler.

A positive impact of limited swimming is that the incidence of drowning may have been reduced. Data from one province in China, the Australian coast, and the North American great lakes all show reduced drowning rates during COVID-19 compared to data from prior years. [10,11,12] A temporary drop in drowning rates does not mean that reductions in swimming will have a positive impact on drowning in the long run, however. An optimistic view is that delayed swimming lessons will reduce drowning risk since research shows that caregivers offer more attentive supervision when they believe that their child has fewer water competency skills. [13] However, it may turn out that as toddlers and young children return to swimming after the pandemic, their inexperience will increase drowning risk.

Potential costs of swim routine changes may not be recognized immediately. Research shows that swimming lessons may reduce the risk of drowning by 88%. [8] This study shows that many families delayed swimming lessons for their toddlers due to the COVID-19 pandemic. It is unclear whether delayed swimming lessons may increase drowning risk as families start to return to more frequent swimming and excursions in or near bodies of water with toddlers. Additionally, not much is known about the long-term impact on toddlers who do not have early exposure to playing in water. This research shows that over half of toddlers rarely or never swam during the pandemic. The lack of familiarity with water at a young age, delayed swim lessons, and reduced opportunities for families to instruct their toddlers about water safety rules could mean that a large group of young children will be swimming without as much formal or informal water safety instruction as they would have otherwise had.

Fewer swimming outings for families could also mean that toddlers and adults were getting less physical activity. Research on physical activity of parents during the pandemic showed a decrease in swimming. [14] Among adults, there was also an overall decrease in physical activity during the pandemic. [15] It is unknown what the long-term impact of reduced physical activity will be on future physical activity routines and health for all ages.

Prior to the COVID-19 pandemic, inequities in children's swimming abilities were found to be associated with race and socioeconomic status indicators. [16] It is possible that the pandemic amplified certain inequities. Research shows that, in the U.S., the COVID-19 pandemic disproportionately impacted people of color. [17] Additionally, people who were most hurt financially by the pandemic may have been impacted more by the changes in swimming routines. Our research showed that people who typically swam in public, community, or apartment pools were most impacted by swimming pool

closures. In contrast, toddlers with a home pool swam the same amount or more than usual.

Our result that 4% fewer respondents reported swimming in open water during COVID-19 compared to their typical behavior is in contrast with findings from the North American great lakes region, which showed an increased use of great lakes beaches when they re-opened during the early months of the pandemic. [10] It is possible that the use of open water varied greatly in different communities depending on the availability of beaches, lakes, and rivers. Locations, like the great lakes, with an abundance of beach area may have had an increase in usage; however, locations with limited open water availability or open water space that didn't allow for proper social distancing may have had decreased usage. It is also possible that fewer people were accessing open water overall, but that the people who were visiting open water were going much more frequently since so many other options for indoor or outdoor recreation were restricted or perceived as more risky for COVID-19 contraction.

A limitation of this study was that this was a convenience sample of participants, though participants did show variety in demographics, including education and location. Additionally, the data reflects one narrow window in time. Questions were asked during the pandemic, but before the U.S. COVID-19 cases spiked to their initial peak in December, 2020. [18] Potentially, swimming routines became even more restricted as the pandemic progressed.

5. Conclusions

The results of this study highlight some important changes in swimming routines for toddlers as a result of the COVID-19 pandemic. Survey results showed reductions in swimming exposure and swim lesson attendance during a critical age for initial water exploration and skill development. Further research is needed to highlight whether fewer toddlers swimming reduced drowning incidence during the pandemic. Additionally, research is needed to understand potential long-term consequences of reduced swimming exposure and delayed swimming lessons for toddlers.

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Statement of Competing Interests

The authors have no competing interests.

References

- [1] Lotshaw, A.M., Thompson, M., Sadowsky, H.S., Hart, M.K., Millard, M.W., "Quality of life and physical performance in land- and water-based pulmonary rehabilitation", *J Cardiopulm Rehabil Prev*, 27(4). 247-251. 2007.

- [2] U. S. Census Bureau, United States. Economics and Statistics Administration. "Statistical abstract of the United States: 2012", Available: <https://www2.census.gov/library/publications/2011/compendia/statab/131ed/2012-statab.pdf>. August 2011. [Online]
- [3] Denny, S.A., Quan, L., Gilchrist, J., et al., "Prevention of drowning", *J Pediatr*, 143(5). 2019.
- [4] Quan, L., Ramos, W., Harvey, C., et al., "Toward defining water competency: an American Red Cross definition", *Int J Aquatic*, 9(1). 2015.
- [5] Morrongiello, B.A., Sandomierski, M., Schwebel, D.C., Hagel, B., "Are parents just treading water? The impact of participation in swim lessons on parents' judgments of children's drowning risk, swimming ability, and supervision needs", *Accid Anal Prev*, 50. 1169-1175. 2013
- [6] Jorgensen, R., "Supporting early mathematics learning: building mathematical capital through participating in early years swimming", *Early Mathematics Learning and Development*, 217-233. 2017. [Online]
- [7] National Center for Injury Prevention and Control. Centers for Disease Control and Prevention. Web-based Injury Statistics Query and Reporting System, 2018 data, [Online]. Available: www.cdc.gov/injury/wisqars. [Accessed Feb 2021].
- [8] Brenner, R.A., Taneja, G.S., Haynie, D.L., et al., "Association between swimming lessons and drowning in childhood", *Arch Pediatr Adolesc Med*, 163(3). 203. 2009.
- [9] AJMC Staff. "A timeline of COVID-19 developments in 2020". [Online]. Available: <https://www.ajmc.com/view/a-timeline-of-covid19-developments-in-2020>. [Accessed May 21, 2021].
- [10] Houser, C., Vlodarchyk, B., "Impact of COVID-19 on drowning patterns in the Great Lakes region of North America", *Ocean Coast Manag*, 205. 105570. 2021.
- [11] Lawes, J.C., Strasiotto, L., Daw, S., Peden, A.E., "When natural hazards intersect with public health: a preliminary exploration of the impact of bushfires and the COVID-19 pandemic on Australian coastal drowning fatalities", *Int J Environ Res Public Health*, 18(10). 2021.
- [12] Zheng, X.Y., Tang, S.L., Ma, S.L., et al., "Trends of injury mortality during the COVID-19 period in Guangdong, China: a population-based retrospective analysis", *BMJ Open*, 11(6). e045317. 2021.
- [13] Johnson, M.B., Boriack, E.D., McConnell, C.M., Williams, S.R., Naiditch, J.A., Lawson, K.A., "Predictors of swimming pool supervision for caregivers of toddlers", *J Inj Violence Res*, 13(2). 141-150. July 2021.
- [14] Curtis, R.G., Olds, T., Ferguson, T., et al., "Changes in diet, activity, weight, and wellbeing of parents during COVID-19 lockdown", *PLoS One*, 16(3). e0248008. 2021.
- [15] Caputo, E.L., Reichert, F.F., "Studies of physical activity and COVID-19 during the pandemic: a scoping review", *J Phys Act Health*, 17(12). 1275-1284. 2020.
- [16] Irwin, C.C., Pharr, J.R., Irwin, R.L., Layne, T.E., "Youth swimming ability and associated factors in the United States, 2010-17", *Am J Health Behav*, 42(5). 32-42. 2018.
- [17] Krouse, H.J., "COVID-19 and the widening gap in health inequity", *Otolaryngol Head Neck Surg*, 163(1). 65-66. 2020.
- [18] Centers for Disease Control and Prevention, "COVID data tracker weekly review", June 11, 2021. [Online]. Available: <https://www.cdc.gov/coronavirus/2019-ncov/covid-data/covidview/index.html>. [Accessed June 21, 2021].

